CPC COOPERATIVE PATENT CLASSIFICATION

G PHYSICS
(NOTES omitted)

INSTRUMENTS

G06 COMPUTING; CALCULATING; COUNTING
(NOTES omitted)

G06F ELECTRIC DIGITAL DATA PROCESSING (computer systems based on specific computational models G06N)

NOTE

In this subclass, the following terms or expressions are used with the meaning indicated:

- "handling" includes processing or transporting of data;
- "data processing equipment" means an association of an electric digital data processor classifiable under group G06F 7/00, with one or more arrangements classifiable under groups G06F 1/00 - G06F 5/00 and G06F 9/00 - G06F 13/00.

WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
   - G06F 3/18 covered by G06F 3/00, G06K 11/00
   - G06F 7/04 covered by G06F 7/02
   - G06F 9/302 - G06F 9/318 covered by G06F 9/30

2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00 Details not covered by groups G06F 3/00 - G06F 13/00 and G06F 21/00 (architectures of general purpose stored program computers G06F 15/76)

1/02 . . . Digital function generators (evaluating functions by calculating only G06F 7/544, G06F 7/60; generating sawtooth or staircase waveforms H03K 4/00)

1/022 . . . [Waveform generators, i.e. devices for generating periodical functions of time, e.g. direct digital synthesizers (G06F 1/025, G06F 1/03 take precedence)]

1/025 . . . for functions having two-valued amplitude, e.g. Walsh functions (generation of pulse trains in general H03K 3/00)

1/0255 . . . [Walsh or analogous functions]

1/03 . . . working, at least partly, by table look-up (G06F 1/025 takes precedence)

NOTE

In order to be classified in this group, the table must contain function values of the desired or an intermediate function, not merely coefficients.

1/0307 . . . [Logarithmic or exponential functions (G06F 1/0314, G06F 1/035 take precedence)]

1/0314 . . . [the table being stored on a peripheral device, e.g. papertape, drum]

1/0321 . . . [Waveform generators, i.e. devices for generating periodical functions of time, e.g. direct digital synthesizers (G06F 1/0314, G06F 1/035 take precedence)]

1/0328 . . . . . . [in which the phase increment is adjustable, e.g. by using an adder-accumulator]

1/0335 . . . . . . [the phase increment itself being a composed function of two or more variables, e.g. frequency and phase]

1/0342 . . . . . . [for generating simultaneously two or more related waveforms, e.g. with different phase angles only]

1/035 . . . Reduction of table size (G06F 1/0314 takes precedence)

1/0353 . . . . . . [by using symmetrical properties of the function, e.g. using most significant bits for quadrant control]

1/0356 . . . . . . [by using two or more smaller tables, e.g. addressed by parts of the argument]

1/04 . . . Generating or distributing clock signals or signals derived directly therefrom

1/06 . . . Clock generators producing several clock signals (G06F 1/08 - G06F 1/14 take precedence)

1/08 . . . Clock generators with changeable or programmable clock frequency

1/10 . . . Distribution of clock signals, e.g. skew

1/105 . . . {in which the distribution is at least partially optical}

1/12 . . . Synchronisation of different clock signals (provided by a plurality of clock generators)

1/14 . . . Time supervision arrangements, e.g. real time clock

1/16 . . . Constructional details or arrangements
I/1601 . . . (Constructional details related to the housing of computer displays, e.g. of CRT monitors, of flat displays (constructional details related to flat displays integrated in a portable computer, e.g. laptop, handheld computer G06F 1/1637; constructional details related to television receivers H04N 5/64))

I/1603 . . . . (Arrangements to protect the display from incident light, e.g. hoods)

I/1605 . . . . (Multimedia displays, e.g. with integrated or attached speakers, cameras, microphones)

I/1607 . . . . (Arrangements to support accessories mechanically attached to the display housing (G06F 1/1603, G06F 1/1605; constructional details related to the housing of computer displays with several bodies H04M 1/0206))

I/1609 . . . . (to support filters or lenses)

I/1611 . . . . (to support document holders)

I/1613 . . . . (for portable computers (cooling arrangements therefor G06F 1/203; constructional details or arrangements for pocket calculators, electronic agendas or books G06F 15/0216; constructional details of portable telephone sets: with several bodies H04M 1/0206))

I/1615 . . . . (with several enclosures having relative motions, each enclosure supporting at least one I/O or computing function (constructional details of portable telephones comprising a plurality of mechanically joined movable body parts H04M 1/0206))

I/1616 . . . . (with folding flat displays, e.g. laptop computers or notebooks having a clamshell configuration, with body parts pivoting to an open position around an axis parallel to the plane they define in closed position)

I/1618 . . . . (the display being foldable up to the back of the other housing with a single degree of freedom, e.g. by 360° rotation over the axis defined by the rear edge of the base enclosure)

I/162 . . . . (changing, e.g. reversing, the face orientation of the screen with a two degrees of freedom mechanism, e.g. for folding into tablet PC like position or orienting towards the direction opposite to the user to show to a second user)

I/1622 . . . . (with enclosures rotating around an axis perpendicular to the plane they define or with ball-joint coupling, e.g. PDA with display enclosure orientation changeable between portrait and landscape by rotation with respect to a coplanar body enclosure)

I/1624 . . . . (with sliding enclosures, e.g. sliding keyboard or display)

I/1626 . . . . (with a single-body enclosure integrating a flat display, e.g. Personal Digital Assistants [PDAs])

I/1628 . . . . (Carrying enclosures containing additional elements, e.g. case for a laptop and a printer)

I/163 . . . . (Wearable computers, e.g. on a belt)

I/1632 . . . . (External expansion units, e.g. docking stations)

I/1633 . . . . (Constructional details or arrangements of portable computers not specific to the type of enclosures covered by groups G06F 1/1615 - G06F 1/1626)

I/1635 . . . . (Details related to the integration of battery packs and other power supplies such as fuel cells or integrated AC adapter (details of mounting batteries in general H01M 2/1023))

I/1637 . . . . (Details related to the display arrangement, including those related to the mounting of the display in the housing (constructional details related to the housing of computer displays in general G06F 1/1601))

I/1639 . . . . (the display being based on projection)

I/1641 . . . . (the display being formed by a plurality of foldable display components (G06F 1/1647; constructional details related to the housing of computer displays with several bodies H04M 1/0206))

I/1643 . . . . (the display being associated to a digitizer, e.g. laptops that can be used as pendants (touchpads integrated in a laptop or similar computer G06F 1/1609; secondary touch screen G06F 1/1602; details related to the relative motion of the display enclosure with respect to the body enclosure, e.g. to move between laptop and tablet PC configuration G06F 1/1615))

I/1645 . . . . (the display being suitable to be used in combination with an external overhead projector)

I/1647 . . . . (including at least an additional display (G06F 1/1602; constructional details related to the housing of computer displays with several bodies H04M 1/0206))

I/1649 . . . . (the additional display being independently orientable, e.g. for presenting information to a second user)

I/165 . . . . . . (the additional display being small, e.g. for presenting status information)

I/1652 . . . . . (the display being flexible, e.g. mimicking a sheet of paper, or rollable)

I/1654 . . . . (the display being detachable, e.g. for remote use)

I/1656 . . . . . (Details related to functional adaptations of the enclosure, e.g. to provide protection against EMI, shock, water, or to host detachable peripherals like a mouse or removable expansions units like PCMCIA cards, or to provide access to internal components for maintenance or to removable storage supports like CDs or DVDs, or to mechanically mount accessories (mounting of accessories to a computer display G06F 1/1607; display hoods G06F 1/1603; cooling arrangements for portable computers G06F 1/203))

I/1658 . . . . . (related to the mounting of internal components, e.g. disc drive or any other functional module)

I/166 . . . . . (related to integrated arrangements for adjusting the position of the main body with respect to the supporting surface, e.g. legs for adjusting the tilt angle)

I/1662 . . . . (Details related to the integrated keyboard)

I/1664 . . . . (Arrangements for ergonomically adjusting the disposition of keys of the integrated keyboard)
O peripherals not covered by groups - G06F 1/1675
{ Constructional details or specified in G06F 1/1615 independently from the movement typologies or enclosure parts which could be adopted movement between the different enclosures { Miscellaneous details related to the relative and subgroups }

pointing devices G06F 3/033 or touch stripes ( G06F 1/1643 between keyboard keys, touch pads or touch stripes ( G06F 1/1643 takes precedence; constructional details of pointing devices G06F 3/033; joysticks in general G05G 9/047) }

{ the I/O peripheral being a secondary touch screen used as control interface, e.g. virtual buttons or sliders }

{ Arrangements for reducing the size of the integrated keyboard for transport, e.g. foldable keyboards, keyboards with collapsible keys ( G06F 1/1664 takes precedence) }

{ Arrangements for adjusting the tilt angle of the integrated keyboard independently from the main body (adjusting the tilt angle integrally with the main body G06F 1/166) }

[Detachable keyboards]

{ Special purpose buttons or auxiliary keyboards, e.g. retractable mini keypads, keypads or buttons that remain accessible at closed laptop ( G06F 1/1666 takes precedence) }

{ Arrangements for projecting a virtual keyboard }

{ Miscellaneous details related to the relative movement between the different enclosures or enclosure parts which could be adopted independently from the movement typologies specified in G06F 1/1615 and subgroups }

{ for detecting open or closed state or particular intermediate positions assumed by movable parts of the enclosure, e.g. detection of display lid position with respect to main body in a laptop, detection of opening of the cover of battery compartment }

{ for locking or maintaining the movable parts of the enclosure in a fixed position, e.g. latching mechanism at the edge of the display in a laptop or for the screen protective cover of a PDA ( G06F 1/1681 takes precedence) }

{ Details related solely to hinges (hinge details related to the transmission of signals or power are classified in G06F 1/1683) }

{ for the transmission of signal or power between the different housings, e.g. details of wired or wireless communication, passage of cabling }

{ Constructional details or arrangements related to integrated I/O peripherals not covered by groups G06F 1/1635 - G06F 1/1675 }

{ the I/O peripheral being an integrated camera }

{ the I/O peripheral being integrated loudspeakers }

{ the I/O peripheral being an integrated pointing device, e.g. trackball in the palm rest area, mini-joystick integrated between keyboard keys, touch pads or touch stripes ( G06F 1/1643 takes precedence; constructional details of pointing devices G06F 3/033; joysticks in general G05G 9/047) }

{ the I/O peripheral being a single or a set of motion sensors for pointer control or gesture input obtained by sensing movements of the portable computer }

{ the I/O peripheral being a printing or scanning device }

{ the I/O peripheral being a sending/receiving arrangement to establish a cordless communication link, e.g. radio or infrared link, integrated cellular phone (details of antennas disposed inside a computer H01Q 1/2266) }

1/18 . . Packaging or power distribution { (for electrical apparatus in general H05K, H02J) }

1/181 . . { Enclosures (for electric apparatus in general H05K 5/00; for portable computers G06F 1/1613) }

1/182 . . . . { with special features, e.g. for use in industrial environments; grounding or shielding against radio frequency interference [RFI] or electromagnetical interference [EMI] (in general H05K 9/00) }

1/183 . . . { Internal mounting support structures, e.g. for printed circuit boards (in general H05K 7/1422), internal connecting means (for buses G06F 13/409) }

1/184 . . . . { Mounting of motherboards (in general H05K 7/1429) }

1/185 . . . . { Mounting of expansion boards (in general H05K 7/1417) }

1/186 . . . . { Securing of expansion boards in correspondence to slots provided at the computer enclosure (in general H05K 7/1402) }

1/187 . . . . { Mounting of fixed and removable disk drives (constructional details of disk drives housings in general G11B 33/00) }

1/188 . . . . { Mounting of power supply units (power supply for computers, per se G06F 1/26) }

1/189 . . . . { Power distribution }

1/20 . . . . Cooling means

1/203 . . . . { for portable computers, e.g. for laptops }

1/206 . . . . { comprising thermal management }

1/22 . . . . Means for limiting or controlling the pin/gate ratio

1/24 . . . . Resetting means

1/26 . . . . Power supply means, e.g. regulation thereof (for memories G11C)

1/263 . . . . { Arrangements for using multiple switchable power supplies, e.g. battery and AC ( G06F 1/30 takes precedence) }

1/266 . . . . { Arrangements to supply power to external peripherals either directly from the computer or under computer control, e.g. supply of power through the communication port, computer controlled power-strips }

1/28 . . . . Supervision thereof, e.g. detecting power-supply failure by out of limits supervision

1/30 . . . . Means for acting in the event of power-supply failure or interruption, e.g. power-supply fluctuations (for resetting only G06F 1/24)

1/305 . . . . { in the event of power-supply fluctuations }

1/32 . . . . Means for saving power

1/3203 . . . . Power management, i.e. event-based initiation of power-saving mode
3/006 . . . . Monitoring of events, devices or parameters that trigger a change in power modality
3/009 . . . . Monitoring remote activity, e.g. over telephone lines or network connections
3/012 . . . . Monitoring battery levels, e.g. power saving mode being initiated when battery voltage goes below a certain level
3/015 . . . . Monitoring of peripheral devices
3/018 . . . . of display devices
3/021 . . . . of disk drive devices
3/025 . . . . of memory devices
3/028 . . . . Monitoring task completion, e.g. by use of idle timers, stop commands or wait commands
3/031 . . . . Monitoring the presence, absence or movement of users

3/034 . . . . Power saving characterised by the action undertaken
3/037 . . . . by disabling clock generation or distribution
3/034 . . . . by lowering clock frequency
3/043 . . . . [Power saving in microcontroller unit]
3/046 . . . . by software initiated power-off
3/05 . . . . [Power saving in peripheral device]
3/053 . . . . [Power saving in bus]
3/056 . . . . [Power saving in optical drive]
3/059 . . . . [Power saving in cursor control device, e.g. mouse, joystick, trackball]
3/062 . . . . [Power saving in digitizer or tablet]
3/065 . . . . [Power saving in display device]
3/068 . . . . [Power saving in hard disk drive]
3/071 . . . . [Power saving in keyboard]
3/075 . . . . [Power saving in memory, e.g. RAM, cache]
3/078 . . . . [Power saving in modem or I/O interface]
3/081 . . . . [Power saving in PCMCIA card]
3/084 . . . . [Power saving in printer]
3/087 . . . . by switching off individual functional units in the computer system
3/089 . . . . by task scheduling
3/093 . . . . by switching to a less power-consuming processor, e.g. sub-CPU
3/096 . . . . by lowering the supply or operating voltage

3/00 . . . . Input arrangements for transferring data to be processed into a form capable of being handled by the computer; Output arrangements for transferring data from processing unit to output unit, e.g. interface arrangements (typewriters B41F; conversion of physical variables F15B 5/00; G01; image acquisition G06T 1/00; G06F 9/00; coding, decoding or code conversion in general H03M; transmission of digital information H04L; [in regulating or control systems G05B])

3/002 . . . . [Specific input/output arrangements not covered by G06F 3/02 - G06F 3/16, e.g. facsimile, microfilm (facsimile per se H04N 1/00; viewers photographic printing G03B; electrography, magnetography G03G; other optical apparatus G02B 27/00)]
3/005 . . . . [Input arrangements through a video camera]

3/007 . . . . [Digital input from or digital output to memories of the shift register type, e.g. magnetic bubble memories, CCD memories (magnetic bubble memories per se G11C 19/08; CCD memories per se G11C 19/28)]
3/01 . . . . Input arrangements or combined input and output arrangements for interaction between user and computer (G06F 3/16 takes precedence)
3/011 . . . . [Arrangements for interaction with the human body, e.g. for user immersion in virtual reality (for handicapped people in general A61F 4/00; robot control B25J; tactile signalling G08B; blind teaching G09B 21/00; for electromphonic musical instruments G10H 1/34; electronic switches characterised by the way in which the control signals are generated H03K 17/94)]
3/012 . . . . [Head tracking input arrangements]
3/013 . . . . [Eye tracking input arrangements (G06F 3/015 takes precedence)]
3/014 . . . . [Hand-worn input/output arrangements, e.g. data gloves]
3/015 . . . . [Input arrangements based on nervous system activity detection, e.g. brain waves [EEG] detection, electromyograms [EMG] detection, electrodemal response detection]
3/016 . . . . [Input arrangements with force or tactile feedback as computer generated output to the user]
3/017 . . . . [Gesture based interaction, e.g. based on a set of recognized hand gestures (interaction based on gestures traced on a digitiser G06F 3/04883)]
3/018 . . . . [Input/output arrangements for oriental characters]
3/02 . . . . Input arrangements using manually operated switches, e.g. using keyboards or dial (keyboard switches per se H01H 13/70; electronic switches characterised by the way in which the control signals are generated H03K 17/94)
3/0202 . . . . [Constructional details or processes of manufacture of the input device]
3/0205 . . . . [Lever arrangements for operating keyboard cursor control keys in a joystick-like manner]
3/0208 . . . . [Arrangements for adjusting the tilt angle of a keyboard, e.g. pivoting legs (for keyboards integrated in a laptop computer G06F 1/1667)]
3/021 . . . . [Arrangements integrating additional peripherals in a keyboard, e.g. card or barcode reader, optical scanner]
3/0213 . . . . [Arrangements providing an integrated pointing device in a keyboard, e.g. trackball, mini-joystick (for pointing devices integrated in a laptop computer G06F 1/169; joysticks G05G 9/04; constructional details of pointing devices G06F 3/033)]
3/0216 . . . . [Arrangements for ergonomically adjusting the disposition of keys of a keyboard (for keyboards integrated in a laptop computer G06F 1/1664)]
3/0219 . . . . [Special purpose keyboards]
NOTE

In this group, the first place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place.

3/0221 . . . . . [Arrangements for reducing keyboard size for transport or storage, e.g. foldable keyboards, keyboards with collapsible keys (G06F 3/0216 takes precedence; for keyboards integrated in a laptop computer G06F 1/1666)]

3/0224 . . . . . [Key guide holders]

3/0227 . . . . . [Cooperation and interconnection of the input arrangement with other functional units of a computer (G06F 3/023 - G06F 3/037 take precedence)]

3/023 . . . . . Arrangements for converting discrete items of information into a coded form, e.g. arrangements for interpreting keyboard generated codes as alphanumeric codes, operand codes or instruction codes {coding in connection with keyboards or like devices in general H03M 11/00}]

3/0231 . . . . . [Cordial keyboards]

3/0232 . . . . . [Manual direct entries, e.g. key to main memory]

3/0233 . . . . . [Character input methods]

3/0234 . . . . . [using switches operable in different directions]

3/0235 . . . . . [using chord techniques (G06F 3/0234 takes precedence)]

3/0236 . . . . . [using selection techniques to select from displayed items]

3/0237 . . . . . [Programmable keyboards (key guide holders G06F 3/0224)]

3/027 . . . . . for insertion of decimal point {display of decimal point G06F 3/1407; complete desktop or hand-held calculators G06F 15/02}

3/03 . . . . . Arrangements for converting the position or the displacement of a member into a coded form

3/0304 . . . . . [Detection arrangements using opto-electronic means (constructional details of pointing devices not related to the detection arrangement using opto-electronic means G06F 3/033 and subgroups; optical digitisers G06F 3/042)]

3/0308 . . . . . [comprising a plurality of distinctive and separately oriented light emitters or reflectors associated to the pointing device, e.g. remote cursor controller with distinct and separately oriented LEDs at the tip whose radiations are captured by a photo-detector associated to the screen]

3/0312 . . . . . [for tracking the rotation of a spherical or circular member, e.g. optical rotary encoders used in mice or trackballs using a tracking ball or in mouse scroll wheels (tracking relative movement in co-operation with a regularly or irregularly patterned surface, e.g. as in optical mice G06F 3/0317; constructional details of scroll or thumb-wheels G06F 3/0362; optical rotary encoders G01D 5/3473; thumb wheel switches H01H 19/00)]

3/0317 . . . . . [in co-operation with a patterned surface, e.g. absolute position or relative movement detection for an optical mouse or pen positioned with respect to a coded surface]

3/0321 . . . . . [by optically sensing the absolute position with respect to a regularly patterned surface forming a passive digitiser, e.g. pen optically detecting position indicative tags printed on a paper sheet (constructional details of pen-shaped pointing devices G06F 3/0354.5, G06F 3/0342, G06F 3/037)]

3/0325 . . . . . [using a plurality of light emitters or reflectors or a plurality of detectors forming a reference frame from which to derive the orientation of the object, e.g. by triangulation or on the basis of reference deformation in the picked up image]

3/033 . . . . . Pointing devices displaced or positioned by the user, e.g. mice, trackballs, pens or joysticks; Accessories therefor [(constructional details of joysticks G05G 9/047; arrangement for interfacing a joystick to a computer G06F 3/038)]

3/0334 . . . . . [Foot operated pointing devices]

3/0338 . . . . . with detection of limited linear or angular displacement of an operating part of the device from a neutral position, e.g. isotonic or isometric joysticks

3/0346 . . . . . [with detection of the device orientation or free movement in a 3D space, e.g. 3D mice, 6-DOF [six degrees of freedom] pointers using gyroscopes, accelerometers or tilt-sensors]

3/0354 . . . . . [with detection of 2D relative movements between the device, or an operating part thereof, and a plane or surface, e.g. 2D mice, trackballs, pens or pucks]

3/03541 . . . . . [Mouse/trackball convertible devices, in which the same ball is used to track the 2D relative movement]

3/03542 . . . . . [Light pens for emitting or receiving light]

3/03543 . . . . . [Mice or pucks (G06F 3/03541 takes precedence)]

3/03544 . . . . . [having dual sensing arrangement, e.g. two balls or two coils used to track rotation of the pointing device]

3/03545 . . . . . [Pens or stylus]

3/03546 . . . . . [using a rotatable ball at the tip as position detecting member]

3/03547 . . . . . [Touch pads, in which fingers can move on a surface]
3/03548 . . . . . {Sliders, in which the moving part moves in a plane}
3/03549 . . . . . {Trackballs (G06F 3/03541 takes precedence)}
3/0362 . . . . . with detection of 1D translations or rotations of an operating part of the device, e.g. scroll wheels, sliders, knobs, rollers or belts
3/037 . . . . . using the raster scan of a cathode-ray tube [CRT] for detecting the position of the member, e.g. light pens cooperating with CRT monitors
3/038 . . . . . Control and interface arrangements therefor, e.g. drivers or device-embedded control circuitry
3/0383 . . . . . [Signal control means within the pointing device]
3/0386 . . . . . {for light pen}
3/039 . . . . . Accessories therefor, e.g. mouse pads

**WARNING**
Group G06F 3/039 is impacted by reclassification into group G06F 3/0393. Groups G06F 3/039 and G06F 3/0393 should be considered in order to perform a complete search.

3/0393 . . . . . {Accessories for touch pads or touch screens, e.g. mechanical guides added to touch screens for drawing straight lines, hard keys overlaying touch screens or touch pads}

**WARNING**
Group G06F 3/0393 is incomplete pending reclassification of documents from group G06F 3/039. Groups G06F 3/039 and G06F 3/0393 should be considered in order to perform a complete search.

3/0395 . . . . . {Mouse pads}
3/041 . . . . . Digitisers, e.g. for touch screens or touch pads, characterised by the transducing means
3/0412 . . . . . {Digitisers structurally integrated in a display}
3/0414 . . . . . [using force sensing means to determine a position]

**WARNING**
Group G06F 3/0414 is impacted by reclassification into groups G06F 3/04142, G06F 3/04144 and G06F 3/04146. All groups listed in this Warning should be considered in order to perform a complete search.

3/04142 . . . . . {the force sensing means being located peripherally, e.g. disposed at the corners or at the side of a touch sensing plate}

**WARNING**
Group G06F 3/04142 is incomplete pending reclassification of documents from group G06F 3/0414. Groups G06F 3/0414 and G06F 3/04142 should be considered in order to perform a complete search.

3/04144 . . . . . {using an array of force sensing means (position sensing using the local deformation of sensor cells G06F 3/0447)}

**WARNING**
Group G06F 3/04144 is incomplete pending reclassification of documents from group G06F 3/0414. Groups G06F 3/0414 and G06F 3/04144 should be considered in order to perform a complete search.

3/04146 . . . . . {using pressure sensitive conductive elements delivering a boolean signal and located between crossing sensing lines, e.g. located between X and Y sensing line layers}

**WARNING**
Group G06F 3/04146 is incomplete pending reclassification of documents from group G06F 3/0414. Groups G06F 3/0414 and G06F 3/04146 should be considered in order to perform a complete search.

3/0416 . . . . . {Control or interface arrangements specially adapted for digitisers}

**WARNING**
Group G06F 3/0416 is impacted by reclassification into groups G06F 3/04162, G06F 3/04164, G06F 3/04166, G06F 3/041661, and G06F 3/041662. All groups listed in this Warning should be considered in order to perform a complete search.

3/04162 . . . . . {for exchanging data with external devices, e.g. smart pens, via the digitiser sensing hardware}

**WARNING**
Group G06F 3/04162 is incomplete pending reclassification of documents from group G06F 3/0416. Groups G06F 3/0416 and G06F 3/04162 should be considered in order to perform a complete search.
3/04164 . . . . {Connections between sensors and controllers, e.g. routing lines between electrodes and connection pads}

**WARNING**

Group G06F 3/04164 is incomplete pending reclassification of documents from group G06F 3/0416.
Groups G06F 3/0416 and G06F 3/04164 should be considered in order to perform a complete search.

3/04166 . . . . {Details of scanning methods, e.g. sampling time, grouping of sub areas or time sharing with display driving (Synchronisation with the driving of the display or the backlighting unit to avoid interferences generated internally G06F 3/04184)}

**WARNING**

Group G06F 3/04166 is incomplete pending reclassification of documents from group G06F 3/0416.
Groups G06F 3/0416 and G06F 3/04166 should be considered in order to perform a complete search.

3/041661 . . . . {using detection at multiple resolutions, e.g. coarse and fine scanning; using detection within a limited area, e.g. object tracking window}

**WARNING**

Group G06F 3/041661 is incomplete pending reclassification of documents from group G06F 3/0416.
Groups G06F 3/0416 and G06F 3/041661 should be considered in order to perform a complete search.

3/041662 . . . . {using alternate mutual and self-capacitive scanning}

**WARNING**

Group G06F 3/041662 is incomplete pending reclassification of documents from group G06F 3/0416.
Groups G06F 3/0416 and G06F 3/041662 should be considered in order to perform a complete search.

3/0418 . . . . {for error correction or compensation, e.g. based on parallax, calibration or alignment}

**WARNING**

All groups listed in this Warning should be considered in order to perform a complete search.

3/04182 . . . . {Filtering of noise external to the device and not generated by digitiser components}

**WARNING**

Group G06F 3/04182 is incomplete pending reclassification of documents from group G06F 3/0418.
Groups G06F 3/0418 and G06F 3/04182 should be considered in order to perform a complete search.

3/04184 . . . . {Synchronisation with the driving of the display or the backlighting unit to avoid interferences generated internally}

**WARNING**

Group G06F 3/04184 is incomplete pending reclassification of documents from group G06F 3/0418.
Groups G06F 3/0418 and G06F 3/04184 should be considered in order to perform a complete search.

3/04186 . . . . {Touch location disambiguation}

**WARNING**

Group G06F 3/04186 is incomplete pending reclassification of documents from group G06F 3/0418.
Groups G06F 3/0418 and G06F 3/04186 should be considered in order to perform a complete search.

3/042 . . . . by opto-electronic means

3/0421 . . . . {by interrupting or reflecting a light beam, e.g. optical touch-screen}

3/0423 . . . . {using sweeping light beams, e.g. using rotating or vibrating mirror}

3/0425 . . . . {using a single imaging device like a video camera for tracking the absolute position of a single or a plurality of objects with respect to an imaged reference surface, e.g. video camera imaging a display or a projection screen, a table or a wall surface, on which a computer generated image is displayed or projected (tracking a projected light spot to determine a position on a display surface G06F 3/0386)}

3/0426 . . . . {tracking fingers with respect to a virtual keyboard projected or printed on the surface (virtual keyboards on touch screens G06F 3/0488)}

3/0428 . . . . {by sensing at the edges of the touch surface the interruption of optical paths, e.g. an illumination plane, parallel to the touch surface which may be virtual (sensing beam interruptions in a planar beam grid of an optical touch-screen G06F 3/0421)}

3/043 . . . . using propagating acoustic waves
1. This group covers subject matter where the focus is placed on the way the user can interact with the displayed data. The mere presence of a standard GUI in the context of the disclosure of a specific software application or a specific device capable of processing data related to its specific function, should be in general classified in the appropriate subclasses related to those software applications or specific devices.

2. In this group, multi-aspect classification is applied, so that subject matter characterised by aspects covered by more than one of its groups, which is considered to represent information of interest for search, should be classified in each of those groups.

3.0481 . . . . . based on specific properties of the displayed interaction object or a metaphor-based environment, e.g. interaction with desktop elements like windows or icons, or assisted by a cursor's changing behaviour or appearance

3.04812 . . . . . [interaction techniques based on cursor appearance or behaviour being affected by the presence of displayed objects, e.g. visual feedback during interaction with elements of a graphical user interface through change in cursor appearance, constraint movement or attraction/repulsion with respect to a displayed object (interaction techniques based on cursor behaviour involving tactile or force feedback G06F 3/016)]

3.04815 . . . . . [Interaction with three-dimensional environments, e.g. control of viewpoint to navigate in the environment]

3.04817 . . . . . [using icons (graphical programming languages using iconic symbols G06F 8/34)]

3.0482 . . . . . interaction with lists of selectable items, e.g. menus

3.0483 . . . . . interaction with page-structured environments, e.g. book metaphor

3.0484 . . . . . for the control of specific functions or operations, e.g. selecting or manipulating an object or an image, setting a parameter value or selecting a range

3.04842 . . . . . [Selection of a displayed object (G06F 3/0482 takes precedence)]

3.04845 . . . . . [for image manipulation, e.g. dragging, rotation]

3.04847 . . . . . [Interaction techniques to control parameter settings, e.g. interaction with sliders, dials]

3.0485 . . . . . Scrolling or panning

3.04855 . . . . . [Interaction with scrollbars]

3.0486 . . . . . Drag-and-drop

3.0487 . . . . . using specific features provided by the input device, e.g. functions controlled by the rotation of a mouse with dual sensing arrangements, or of the nature of the input device, e.g. tap gestures based on pressure sensed by a digitiser

3.0488 . . . . . using a touch-screen or digitiser, e.g. input of commands through traced gestures

3.04883 . . . . . [for entering handwritten data, e.g. gestures, text]

3.04886 . . . . . [by partitioning the screen or tablet into independently controllable areas, e.g. virtual keyboards, menus (G06F 3/04883 takes precedence)]

3.0489 . . . . . using dedicated keyboard keys or combinations thereof
information retrieval G06F 16/00
memory systems or architectures G06F 12/00
systems G06F 11/00
correction, monitoring per se
networked record carriers ( recording or reproducing
 carriers, { e.g. RAID, emulated record carriers,
 regarding storage
})
{ error detection, error G11B
Digital input from or digital output to record
; Digital input using the sampling of an analogue
quantity at regular intervals of time , input from a/d
converter or output to d/a converter)
Digital input from or digital output to record
carriers, [e.g. RAID, emulated record carriers,
networked record carriers (recording or reproducing
devices per se G11B; error detection, error
correction, monitoring per se regarding storage
systems G06F 11/00; accessing or addressing within
memory systems or architectures G06F 12/00;
information retrieval G06F 16/00)]
[ Dedicated interfaces to storage systems]
specifically adapted to achieve a particular
effect]
[ Improving or facilitating administration,
e.g. storage management]
(by facilitating the interaction with a user
or administrator)]
(by facilitating the process of upgrading
existing storage systems, e.g. for
improving compatibility between host and
storage device)
[ Saving storage space on storage systems]
[ Improving I/O performance]
[ in relation to response time]
[ in relation to throughput]
[ Improving the reliability of storage
systems]
[ in relation to life time, e.g. increasing
Mean Time Between Failures [MTBF]]
[ in relation to availability]
[ in relation to data integrity, e.g. data
losses, bit errors]
[ Securing storage systems]
[ in relation to access]
[ in relation to content]
[ Power saving in storage systems]
[ Reducing size or complexity of storage
systems]
[ making use of a particular technique]
[ Configuration or reconfiguration of storage
systems]
[ by allocating resources to storage
systems]
[ by initialisation or re-initialisation of
storage systems]
[ by changing the state or mode of one or
more devices]
[ by changing the path, e.g. traffic
rerouting, path reconfiguration]
3/1207 . . . . . [resulting in the user being informed about print result after a job submission]
3/1208 . . . . . [resulting in improved quality of the output result, e.g. print layout, colours, workflows, print preview]
3/1209 . . . . . [resulting in adapted or bridged legacy communication protocols, e.g. emulation, protocol extension]
3/121 . . . . . [Facilitating exception or error detection and recovery, e.g. fault, media or consumables depleted]
3/1211 . . . . . [Improving printing performance]
3/1212 . . . . . [achieving reduced delay between job submission and print start]
3/1213 . . . . . [at an intermediate node or at the final node]
3/1214 . . . . . [at the submitting node]
3/1215 . . . . . [achieving increased printing speed, i.e. reducing the time between printing start and printing end]
3/1217 . . . . . [achieving reduced idle time at the output device or increased asset utilization]
3/1218 . . . . . [Reducing or saving of used resources, e.g. avoiding waste of consumables or improving usage of hardware resources]
3/1219 . . . . . [with regard to consumables, e.g. ink, toner, paper]
3/122 . . . . . [with regard to computing resources, e.g. memory, CPU]
3/1221 . . . . . [with regard to power consumption]
3/1222 . . . . . [Increasing security of the print job]
3/1223 . . . . . [specifically adapted to use a particular technique]
3/1224 . . . . . [Client or server resources management]
3/1225 . . . . . [Software update, e.g. print driver, modules, plug-ins, fonts]
3/1226 . . . . . [Discovery of devices having required properties]

3/1227 . . . . . [Printer definition files]
3/1228 . . . . . [Printing driverless or using generic drivers]
3/1229 . . . . . [Printer resources management or printer maintenance, e.g. device status, power levels]
3/123 . . . . . [Software or firmware update, e.g. device firmware management]
3/1231 . . . . . [Device related settings, e.g. IP address, Name, Identification]
3/1232 . . . . . [Transmitting printer device capabilities, e.g. upon request or periodically]
3/1234 . . . . . [Errors handling and recovery, e.g. reprinting (G06F 3/1261 takes precedence)]
3/1235 . . . . . [caused by end of consumables, e.g. paper, ink, toner]
3/1236 . . . . . [Connection management]
3/1237 . . . . . [Print job management]
3/1238 . . . . . [Secure printing, e.g. user identification, user rights for device usage, unallowed content, blanking portions or fields of a page, releasing held jobs]
3/1239 . . . . . [Restricting the usage of resources, e.g. usage or user levels, credit limit, consumables, special fonts]
3/124 . . . . . [Parallel printing or parallel ripping]
3/1241 . . . . . [Dividing a job according to job requirements, e.g. black/white and colour pages, covers and body of books, tabs]
3/1242 . . . . . [Image or content composition onto a page]
3/1243 . . . . . [Variable data printing, e.g. document forms, templates, labels, coupons, advertisements, logos, watermarks, transactional printing, fixed content versioning]
3/1244 . . . . . [Job translation or job parsing, e.g. page handing]
3/1245 . . . . . [by conversion to intermediate or common format]
3/1246 . . . . . [by handling markup languages, e.g. XSL, XML, HTML]
3/1247 . . . . . [by conversion to printer ready format]
3/1248 . . . . . [by printer language recognition, e.g. PDL, PCL, PDF]
3/125 . . . . . [Page layout or assigning input pages onto output media, e.g. imposition]
3/1251 . . . . . [for continuous media, e.g. web media, rolls]
3/1252 . . . . . [for sheet based media]
3/1253 . . . . . [Configuration of print job parameters, e.g. using UI at the client]
3/1254 . . . . . [Automatic configuration, e.g. by driver]
3/1255 . . . . . [Settings incompatibility, e.g. constraints, user requirements vs. device capabilities]
3/1256 . . . . . [User feedback, e.g. print preview, test print, proofing, pre-flight checks]
3/1257 . . . . . [by using pre-stored settings, e.g. job templates, presets, print styles]
3/1258 . . . . . [by updating job settings at the printer]
3/1259 . . . . . [Print job monitoring, e.g. job status]
Methods or arrangements for data conversion without changing the order or content of the data handled (by coding or decoding H03M)

5/01  for shifting, e.g. justifying, scaling, normalising (digital stores in which the information is moved stepwise, e.g. shift-registers G11C 19/00; digital stores in which the information circulates G11C 21/00)

5/012  [in floating-point computations]
Methods or arrangements for processing data by operating upon the order or content of the data handled (logic circuits H03K 19/00)

Comparing digital values (G06F 7/06, G06F 7/22) G06F 7/38 takes precedence; information retrieval G06F 16/00; comparing pulses H03K 5/22)

[adaptive, e.g. self learning]

[Magnitude comparison, i.e. determining the relative order of operands based on their numerical value, e.g. window comparator]

Arrangements for sorting, selecting, merging or comparing data on individual record carriers (sorting of postal letters B07C; conveying record carriers from one station to another G06K 13/02)

[by partial product forming (with electric multiplication table)]

[using electromechanical counter-type accumulators]

[by using preset multiples of the multiplicand or the divisor]

[for evaluating functions by calculation]

[using non-contact-making devices, e.g. tube, solid state device; using unspecified devices]

[Computations with complex numbers]

[Complex multiplication]

[using coordinate rotation digital computer [CORDIC]]

[using signed-digit representation]
7/483 . . . . Computations with numbers represented by a non-linear combination of denominational numbers, e.g. rational numbers, logarithmic number system, floating-point numbers (conversion to or from floating-point codes H03M 7/24) \{(G06F 7/4806, G06F 7/4824, G06F 7/49, G06F 7/491, G06F 7/544 take precedence)\}
7/4833 . . . . \{Logarithmic number system\}
7/4836 . . . . \{Computations with rational numbers\}
7/485 . . . . \{Adding; Subtracting \{(G06F 7/4833, G06F 7/4836 take precedence)\}\}
7/487 . . . . \{Multiplying; Dividing \{(G06F 7/4833, G06F 7/4836 take precedence)\}\}
7/4873 . . . . \{Dividing\}
7/4876 . . . . \{Multiplying\}
7/49 . . . . Computations with a radix, other than binary, 8, 16 or decimal, e.g. ternary, negative or imaginary radices, mixed radix \{non-linear PCM \{(G06F 7/4824 takes precedence)\}\}
7/491 . . . . Computations with decimal numbers \{radix 12 or 20, \{(G06F 7/4824 takes precedence)\}\}
7/4912 . . . . \{(Adding; Subtracting \{(G06F 7/492, G06F 7/498 takes precedence)\}\}\}
7/4915 . . . . \{(Multiplying; Dividing \{(G06F 7/492, G06F 7/498 take precedence)\}\}\}
7/4917 . . . . \{Dividing\}
7/492 . . . . using a binary weighted representation within each denomination \{(G06F 7/498 takes precedence)\}
7/4925 . . . . \{(Adding; Subtracting \{(G06F 7/493 takes precedence)\}\}\}
7/493 . . . . \{the representation being the natural binary coded representation, i.e. 8421-code\}
7/494 . . . . \{Adding; Subtracting\}
7/495 . . . . \{in digit-serial fashion, i.e. having a single digit-handling circuit treating all denominations after each other\}
7/496 . . . . \{Multiplying; Dividing\}
7/498 . . . . \{using counter-type accumulators\}
7/4981 . . . . \{Adding; Subtracting\}
7/4983 . . . . \{Multiplying; Dividing\}
7/4985 . . . . \{by successive additions or subtractions\}
7/4986 . . . . \{by successive multiplication or division by 2\}
7/4988 . . . . \{by table look-up\}
7/499 . . . . Denomination or exception handling, e.g. rounding, overflow \NOTE \{ documents published before 12-2005 are not systematically classified in the subgroups of G06F 7/499: See the relevant subgroup of G06F 7/48 and the ICOs G06F 7/499 + \}
7/49905 . . . . \{Exception handling\}
7/4991 . . . . \{Overflow or underflow\}
7/49915 . . . . \{Mantissa overflow or underflow in handling floating-point numbers\}
7/49921 . . . . \{Saturation, i.e. clipping the result to a minimum or maximum value\}
7/49926 . . . . \{Division by zero\}
7/49931 . . . . \{Modulo N reduction of final result\}
7/49936 . . . . \{Normalisation mentioned as feature only\}
7/49942 . . . . \{Significance control\}
7/49947 . . . . \{Rounding\}
7/49952 . . . . \{Sticky bit\}
7/49957 . . . . \{Implementation of IEEE-754 Standard\}
7/49963 . . . . \{Rounding to nearest \{(G06F 7/49957 takes precedence)\}\}
7/49968 . . . . \{Rounding towards positive infinity \{(G06F 7/49957 takes precedence)\}\}
7/49973 . . . . \{Rounding towards negative infinity, e.g. truncation of two's complement numbers \{(G06F 7/49957 takes precedence)\}\}
7/49978 . . . . \{Rounding towards zero \{(G06F 7/49957 takes precedence)\}\}
7/49984 . . . . \{Rounding away from zero\}
7/49989 . . . . \{Interval arithmetic\}
7/49994 . . . . \{Sign extension\}
7/50 . . . . Adding; Subtracting \{(G06F 7/483 - G06F 7/491, G06F 7/544 take precedence)\}
7/501 . . . . Half or full adders, i.e. basic adder cells for one denomination \{EXCLUSIVE-OR circuits H03K 19/21\}
7/5013 . . . . \{using algebraic addition of the input signals, e.g. Kirchhoff adders\}
7/5016 . . . . \{forming at least one of the output signals directly from the minterms of the input signals, i.e. with a minimum number of gate levels\}
7/502 . . . . Half adders: Full adders consisting of two cascaded half adders \{(G06F 7/5013 takes precedence)\}
7/503 . . . . using carry switching, i.e. the incoming carry being connected directly, or only via an inverter, to the carry output under control of a carry propagate signal
7/504 . . . . \{in bit-serial fashion, i.e. having a single digit-handling circuit treating all denominations after each other\}
7/5045 . . . . \{for multiple operands\}
7/505 . . . . \{in bit-parallel fashion, i.e. having a different digit-handling circuit for each denomination \{(half or full adders G06F 7/5013\}\}\}
7/5052 . . . . \{using carry completion detection, either over all stages or at sample stages only\}
7/5055 . . . . \{in which one operand is a constant, i.e. incrementers or decrementers\}
7/5057 . . . . \{using table look-up\}; using programmable logic arrays \{(G06F 7/509 takes precedence)\}
7/506 . . . . \{with simultaneous carry generation for, or propagation over, two or more stages\}
7/507 . . . . \{using selection between two conditionally calculated carry or sum values\}
7/508 . . . . \{using carry look-ahead circuits\}
7/509 . . . . \{for multiple operands, e.g. digital integrators\}
7/5095 . . . . \{word-serial, i.e. with an accumulator-register\}
7/52 . . . Multiplying; Dividing
(G06F 7/483 - G06F 7/491, G06F 7/544 take precedence)
7/523 . . . . Multiplying only
7/5235 . . . . (using indirect methods, e.g. quarter square method, via logarithmic domain)
7/525 . . . . in serial-serial fashion, i.e. both operands being entered serially (G06F 7/533 takes precedence)
7/527 . . . . in serial-parallel fashion, i.e. one operand being entered serially and the other in parallel (G06F 7/533 takes precedence)
7/5272 . . . . { with row wise addition of partial products
7/5275 . . . . { using carry save adders
7/5277 . . . . { with column wise addition of partial products
7/53 . . . . in parallel-parallel fashion, i.e. both operands being entered in parallel (G06F 7/533 takes precedence)
7/5306 . . . . { with row wise addition of partial products (G06F 7/5324 takes precedence)
7/5312 . . . . { using carry save adders
7/5318 . . . . { with column wise addition of partial products, e.g. using Wallace tree, Dadda counters (G06F 7/5324 takes precedence)
7/5324 . . . . { partitioned, i.e. using repetitively a smaller parallel parallel multiplier or using an array of such smaller multipliers
7/533 . . . . Reduction of the number of iteration steps or stages, e.g. using the Booth algorithm, log-sum, odd-even
7/5332 . . . . { by skipping over strings of zeroes or ones, e.g. using the Booth Algorithm
7/5334 . . . . { by using multiple bit scanning, i.e. by decoding groups of successive multiplier bits in order to select an appropriate precalculated multiple of the multiplicand as a partial product
7/5336 . . . . { overlapped, i.e. with successive bitgroups sharing one or more bits being recoded into signed digit representation, e.g. using the Modified Booth Algorithm
7/5338 . . . . { each bitgroup having two new bits, e.g. 2nd order MBA
7/535 . . . . Dividing only
7/537 . . . . Reduction of the number of iteration steps or stages, e.g. using the Sweeney-Robertson-Tocher [SRT] algorithm
7/5375 . . . . { Non restoring calculation, where each digit is either negative, zero or positive, e.g. SRT;
7/544 . . . . for evaluating functions by calculation (G06F 7/4824 takes precedence)
7/5443 . . . . { Sum of products (for applications thereof, see the relevant places, e.g. G06F 17/10, H03H 17(00)
7/5446 . . . . { using crossaddition algorithms, e.g. CORDIC
7/548 . . . . Trigonometric functions; Co-ordinate transformations
7/552 . . . . Powers or roots, [e.g. Pythagorean sums]
7/5525 . . . . { Roots or inverse roots of single operands
7/556 . . . . Logarithmic or exponential functions
7/57 . . . . Arithmetic logic units [ALU], i.e. arrangements or devices for performing two or more of the operations covered by groups G06F 7/483 - G06F 7/556 or for performing logical operations (instruction execution G06F 9/30) (G06F 7/49, G06F 7/491 take precedence; logic gate circuits H03K 19/00)
7/575 . . . . Basic arithmetic logic units, i.e. devices selectable to perform either addition, subtraction or one of several logical operations, using, at least partially, the same circuitry
7/58 . . . Random or pseudo-random number generators
7/582 . . . { Pseudo-random number generators
7/584 . . . { using finite field arithmetic, e.g. using a linear feedback shift register
7/586 . . . { using an integer arithmetic, e.g. using linear congruential method
7/588 . . . { Random number generators, i.e. based on natural stochastic processes
7/60 . . . Methods or arrangements for performing computations using a digital non-denominational number representation, i.e. number representation without radix; Computing devices using combinations of denominational and non-denominational quantity representations, e.g. using multiplication, phase computers, STEELE computers, phase computers (conversion of digital data to or from non-denominational form H03M 5000, H03M 7(00)
7/602 . . . { using delta-sigma sequences
7/605 . . . { Additive or subtractive mixing of two pulse rates into one (beat-frequency oscillators H03B 21/00; input circuits of electric counters, e.g. up-down counters H03K 21/00)
7/607 . . . { number-of-ones counters, i.e. devices for counting the number of input lines set to ONE among a plurality of input lines, also called bit counters or parallel counters (for applications thereof, see the relevant places, e.g. G06F 7/49, G06F 7/5013, G06F 7/509, H03M 1/00, H03M 7/20)
7/62 . . . Performing operations exclusively by counting total number of pulses {; Multiplication, division or derived operations using combined denominational and incremental processing by counters, i.e. without column shift (G06F 7/408 takes precedence)
7/64 . . . Digital differential analysers, i.e. computing devices for differentiation, integration or solving differential or integral equations, using pulses representing increments; Other incremental computing devices for solving difference equations (G06F 7/70 takes precedence; differential analysers using hybrid computing techniques G06J 1/02 {; DDA application in numerical control G05B 19/18})
7/66 . . . wherein pulses represent unitary increments only
organisational aspects of software project management
debugging G06F 11/36
Arrangements for software engineering

Software design
G06F 7/22
(according to the content of the data G06F 7/06 rules, independently of the content of the data selecting data according to predetermined, e.g. parallel / series conversion or vice versa ;
Arrangements for rearranging, permuting or
encoding within a word the position of one or more bits having a specified value, e.g. most or least significant one or zero detection, priority encoders [(with shifting G06F 5/01)]

Arrangements for rearranging, permuting or selecting data according to predetermined rules, independently of the content of the data (according to the content of the data G06F 7/06, G06F 7/22; parallel / series conversion or vice versa H03M 9/00)

[having at least two separately controlled rearrangement levels, e.g. multistage interconnection networks (G06F 7/764 - G06F 7/768 take precedence)]

[Masking]

Generation of all possible permutations

(Data position reversal, e.g. bit reversal, byte swapping]

for changing the order of data flow, e.g. matrix transposition, LIFO buffers; Overflow or underflow handling therefor

[having a sequence of storage locations each being individually accessible for both enqueue and dequeue operations, e.g. using a RAM]

Arrangements for software engineering (testing or debugging G06F 11/36; administrative, planning or organisation aspects of software project management G06Q 10/06)

Requirements analysis; Specification techniques

Software design

[Procedural]

[Object-oriented]
8/454 . . . . {Consistency (cache consistency protocols in hierarchically structured memory systems G06F 12/0815)}
8/456 . . . . [Parallelism detection]
8/457 . . . . [Communication (intertask communication G06F 9/54)]
8/458 . . . . [Synchronisation, e.g. post-wait, barriers, locks (synchronisation among tasks G06F 9/52)]
8/47 . . . . [Retargetable compilers]
8/48 . . . . [Incremental compilation (software reuse G06F 8/36)]
8/49 . . . . [Partial evaluation]
8/51 . . Source to source
8/52 . . Binary to binary
8/53 . . Decompilation; Disassembly
8/54 . . Link editing before load time
8/60 . Software deployment
8/61 . . Installation
8/62 . . [Uninstallation]
8/63 . . [Image based installation; Cloning; Build to order]
8/64 . . [Retargetable]
8/65 . . Updates (security arrangements therefor G06F 21/57)

WARNING
Group G06F 8/65 is impacted by reclassification into groups G06F 21/57 - G06F 21/577.
All groups listed in this Warning should be considered in order to perform a complete search.

8/654 . . . . using techniques specially adapted for alterable solid state memories, e.g. for EEPROM or flash memories
8/656 . . . . while running
8/658 . . . . Incremental updates; Differential updates
8/66 . . . . [of program code stored in read-only memory [ROM]]
8/70 . Software maintenance or management
8/71 . . Version control (security arrangements therefor G06F 21/57); Configuration management

WARNING
Group G06F 8/71 is impacted by reclassification into groups G06F 21/57-G06F 21/577.
All groups listed in this Warning should be considered in order to perform a complete search.

8/72 . . Code refactoring
8/73 . . Program documentation
8/74 . . Reverse engineering; Extracting design information from source code
8/75 . . Structural analysis for program understanding
8/751 . . [Code clone detection]
8/76 . . Adapting program code to run in a different environment; Porting
8/77 . . Software metrics
8/78 . . [Methods to solve the "Year 2000" [Y2K] problem]

9/00 Arrangements for program control, e.g. control units (program control for peripheral devices G06F 13/10)
9/02 . . using wired connections, e.g. plugboards
9/04 . . using record carriers containing only program instructions (G06F 9/06 takes precedence)
9/06 . . using stored programs, i.e. using an internal store of processing equipment to receive or retain programs
9/22 . . Microcontrol or microprogram arrangements
9/223 . . . . [Execution means for microinstructions irrespective of the microinstruction function, e.g. decoding of microinstructions and nanoinstructions; timing of microinstructions; programmable logic arrays; delays and fan-out problems]
9/226 . . . . [Microinstruction function, e.g. input/output microinstruction; diagnostic microinstruction; microinstruction format]
9/24 . . . . Loading of the microprogram
9/26 . . Address formation of the next micro-instruction (G06F 9/28 takes precedence); Microprogram storage or retrieval arrangements
9/261 . . . . [Microinstruction address formation]
9/262 . . . . [Arrangements for next microinstruction selection]
9/264 . . . . . . [Microinstruction selection based on results of processing]
9/265 . . . . . . [by address selection on input of storage]
9/267 . . . . . . [by instruction selection on output of storage]
9/268 . . . . . . [Microinstruction selection not based on processing results, e.g. interrupt, patch, first cycle store, diagnostic programs]
9/28 . . . . Enhancement of operational speed, e.g. by using several microcontrol devices operating in parallel
9/30 . . . . Arrangements for executing machine instructions, e.g. instruction decode (for executing microinstructions G06F 9/22)
9/3003 . . . . . . [Arrangements for executing specific machine instructions]
9/3007 . . . . . . [to perform operations on data operands]
9/3001 . . . . . . [Arithmetic instructions]
9/30014 . . . . . . [with variable precision]
9/30018 . . . . . . [Bit or string instructions; instructions using a mask]
9/30021 . . . . . . [Compare instructions, e.g. Greater-Than, Equal-To, MINMAX]
9/30025 . . . . . . [Format conversion instructions, e.g. Floating-Point to Integer, decimal conversion]
9/30029 . . . . . . [Logical and Boolean instructions, e.g. XOR, NOT]
9/30032 . . . . . . [Movement instructions, e.g. MOVE, SHIFT, ROTATE, SHUFFLE]
9/30036 . . . . . . [Instructions to perform operations on packed data, e.g. vector operations]
9/3004 . . . . . . [to perform operations on memory]
9/30043 . . . . . . [LOAD or STORE instructions; Clear instruction]
9/30047 . . . . . . [Prefetch instructions; cache control instructions]
9/3005 . . . . . . [to perform operations for flow control]
9/30054 . . . . . . . . [Unconditional branch instructions]
9/30058 . . . . . . . . [Conditional branch instructions]
9/30061 . . . . . . . . {Multi-way branch instructions, e.g. CASE}
9/30065 . . . . . . . . (Loop control instructions; iterative instructions, e.g. LOOP, REPEAT)
9/30069 . . . . . . . . [Instruction skipping instructions, e.g. SKIP]
9/30072 . . . . . . . . {to perform conditional operations, e.g. using guard}
9/30076 . . . . . . . . {to perform miscellaneous control operations, e.g. NOP}
9/30079 . . . . . . . . [Pipeline control instructions]
9/30083 . . . . . . . . [Power or thermal control instructions]
9/30087 . . . . . . . . [Synchronisation or serialisation instructions]
9/3009 . . . . . . . . [Thread control instructions]
9/30094 . . . . . . . . [Condition code generation, e.g. Carry, Zero flag]
9/30098 . . . . . . . . [Register arrangements]
9/30101 . . . . . . . . {Special purpose registers}
9/30105 . . . . . . . . [Register structure]
9/30109 . . . . . . . . {having multiple operands in a single register}
9/30112 . . . . . . . . {for variable length data, e.g. single or double registers}
9/30116 . . . . . . . . [Shadow registers, e.g. coupled registers, not forming part of the register space]
9/3012 . . . . . . . . [Organisation of register space, e.g. banked or distributed register file]
9/30123 . . . . . . . . {according to context, e.g. thread buffers]
9/30127 . . . . . . . . {Register windows]
9/3013 . . . . . . . . {according to data content, e.g. floating-point registers, address registers]
9/30134 . . . . . . . . {Register stacks; shift registers]
9/30138 . . . . . . . . {Extension of register space, e.g. register cache]
9/30141 . . . . . . . . {Implementation provisions of register files, e.g. ports]
9/30145 . . . . . . . . {Instruction analysis, e.g. decoding, instruction word fields]
9/30149 . . . . . . . . {of variable length instructions]
9/30152 . . . . . . . . {Determining start or end of instruction; determining instruction length]
9/30156 . . . . . . . . {Special purpose encoding of instructions, e.g. Gray coding]
9/3016 . . . . . . . . {Decoding the operand specifier, e.g. specifier format]
9/30163 . . . . . . . . {with implied specifier, e.g. top of stack]
9/30167 . . . . . . . . {of immediate specifier, e.g. constants]
9/3017 . . . . . . . . {Runtime instruction translation, e.g. macros]
9/30174 . . . . . . . . {for non-native instruction set, e.g. Java byte, legacy code]
9/30178 . . . . . . . . {of compressed or encrypted instructions]
9/30181 . . . . . . . . {Instruction operation extension or modification]
9/30185 . . . . . . . . {according to one or more bits in the instruction, e.g. prefix, sub-opcode]
9/30189 . . . . . . . . {according to execution mode, e.g. mode flag]
9/30192 . . . . . . . . {according to data descriptor, e.g. dynamic data typing]
9/30196 . . . . . . . . {using decoder, e.g. decoder per instruction set, adaptable or programmable decoders]
9/32 . . . . . . . . . . . . . . . . . . [Address formation of the next instruction, e.g. by incrementing the instruction counter (G06F 9/38 takes precedence]
9/321 . . . . . . . . . . . . . . . . . . [Program or instruction counter, e.g. incrementing]
9/322 . . . . . . . . . . . . . . . . . . [for non-sequential address]
9/324 . . . . . . . . . . . . . . . . . . [for program counter relative addressing]
9/325 . . . . . . . . . . . . . . . . . . {for loops, e.g. loop detection, loop counter]
9/327 . . . . . . . . . . . . . . . . . . {for interrupts]
9/328 . . . . . . . . . . . . . . . . . . {for runtime instruction patching]
9/34 . . . . . . . . . . . . . . . . . . [Addressing or accessing the instruction operand or the result; Formation of operand address; Addressing modes (address translation G06F 12/00)]
9/342 . . . . . . . . . . . . . . . . . . {Extension of operand address space]
9/345 . . . . . . . . . . . . . . . . . . {of multiple operands or results (addressing multiple banks G06F 12/06)]
9/3455 . . . . . . . . . . . . . . . . . . {using stride]
9/35 . . . . . . . . . . . . . . . . . . {Indirect addressing [i.e. using single address operand, e.g. address register]
9/355 . . . . . . . . . . . . . . . . . . {Indexed addressing [i.e. using more than one address operand]
9/3552 . . . . . . . . . . . . . . . . . . {using wraparound, e.g. modulo or circular addressing]
9/3555 . . . . . . . . . . . . . . . . . . {using scaling, e.g. multiplication of index]
9/3557 . . . . . . . . . . . . . . . . . . {using program counter as base address]
9/38 . . . . . . . . . . . . . . . . . . [Concurrent instruction execution, e.g. pipeline, look ahead]
9/3802 . . . . . . . . . . . . . . . . . . {Instruction prefetching]
9/3804 . . . . . . . . . . . . . . . . . . {for branches, e.g. hedging, branch folding]
9/3806 . . . . . . . . . . . . . . . . . . {using address prediction, e.g. return stack, branch history buffer]
9/3808 . . . . . . . . . . . . . . . . . . {for instruction reuse, e.g. trace cache, branch target cache]
9/381 . . . . . . . . . . . . . . . . . . {Loop buffering]
9/3812 . . . . . . . . . . . . . . . . . . {with instruction modification, e.g. store into instruction stream]
9/3814 . . . . . . . . . . . . . . . . . . {Implementation provisions of instruction buffers, e.g. prefetch buffer; banks]
9/3816 . . . . . . . . . . . . . . . . . . {Instruction alignment, e.g. cache line crossing]
9/3818 . . . . . . . . . . . . . . . . . . {Decoding for concurrent execution]
9/382 . . . . . . . . . . . . . . . . . . {Pipelined decoding, e.g. using predecoding]
9/3822 . . . . . . . . . . . . . . . . . . {Parallel decoding, e.g. parallel decode units]
9/3824 . . . . . . . . . . . . . . . . . . {Operand accessing]
9/3826 . . . . . . . . . . . . . . . . . . {Data result bypassing, e.g. locally between pipeline stages, within a pipeline stage]
9/3828 . . . . . . . . . . . . . . . . . . {with global bypass, e.g. between pipelines, between clusters]
9/383 . . . . . . . . . . . . . . . . . . {Operand prefetching (cache prefetching G06F 12/0862)]
9/3832 . . . . . . . . . . . . . . . . . . {Value prediction for operands; operand history buffers]
9/3834 . . . . . . . . . . . . . . . . . . {Maintaining memory consistency (cache consistency protocols G06F 12/0815)]}
2009/3883 . . . . . . [(Instruction issuing, e.g. dynamic instruction scheduling, out of order instruction execution]
9/3836 . . . . . . . [Dependency mechanisms, e.g. register scoreboard]
9/3838 . . . . . . . [Register renaming]
9/384 . . . . . . . [Speculative instruction execution]
9/3842 . . . . . . . [using dynamic prediction, e.g. branch history table]
9/3844 . . . . . . . [using static prediction, e.g. branch taken strategy]
9/3846 . . . . . . . [using hybrid branch prediction, e.g. selection between prediction techniques]
9/3851 . . . . . . . [from multiple instruction streams, e.g. multistreaming (initiation or dispatching of multiple tasks or threads G06F 9/48)]
9/3853 . . . . . . . [of compound instructions]
9/3855 . . . . . . . [Reordering, e.g. using a queue, age tags]
9/3857 . . . . . . . [Result writeback, i.e. updating the architectural state]
9/3859 . . . . . . . [with result invalidation, e.g. nullification]
9/3861 . . . . . . . [Recovery, e.g. branch miss-prediction, exception handling (error detection or correction G06F 11/00)]
9/3863 . . . . . . . [using multiple copies of the architectural state, e.g. shadow registers]
9/3865 . . . . . . . [using deferred exception handling, e.g. exception flags]
9/3867 . . . . . . . [using instruction pipelines]
9/3869 . . . . . . . [Implementation aspects, e.g. pipeline latches; pipeline synchronisation and clocking]
9/3871 . . . . . . . [Asynchronous instruction pipeline, e.g. using handshake signals between stages]
9/3873 . . . . . . . [Variable length pipelines, e.g. elastic pipeline]
9/3875 . . . . . . . [Pipelining a single stage, e.g. superpipelining]
9/3877 . . . . . . . [using a slave processor, e.g. coprocessor (peripheral processor G06F 13/12; vector processor G06F 15/8053)]
9/3879 . . . . . . . [for non-native instruction execution, e.g. executing a command; for Java instruction set]
9/3881 . . . . . . . [Arrangements for communication of instructions and data]
9/3883 . . . . . . . [Two-engine architectures, i.e. stand-alone processor acting as a slave processor]
9/3885 . . . . . . . [using a plurality of independent parallel functional units]
9/3887 . . . . . . . [controlled by a single instruction, e.g. SIMD]
9/3889 . . . . . . . [controlled by multiple instructions, e.g. MIMD, decoupled access or execute]
9/3891 . . . . . . . [organised in groups of units sharing resources, e.g. clusters]
9/3893 . . . . . . . [controlled in tandem, e.g. multiplier-accumulator]
9/3895 . . . . . . . [for complex operations, e.g. multidimensional or interleaved address generators, macros]
9/3897 . . . . . . . [with adaptable data path]
9/44 . . . . . . . [Arrangements for executing specific programs]
9/4401 . . . . . . . [Bootstrapping (security arrangements therefor G06F 21/57)]
9/4403 . . . . . . . [Processor initialisation]
9/4405 . . . . . . . [Initialisation of multiprocessor systems]
9/4406 . . . . . . . [Loading of operating system]
9/4408 . . . . . . . [Boot device selection]
9/441 . . . . . . . [Configuring for operating with peripheral devices; Loading of device drivers]
9/4411 . . . . . . . [Plug-and-play [PnP]]
9/4415 . . . . . . . [Self describing peripheral devices]
9/4416 . . . . . . . [Network booting; Remote initial program loading [RIPL]]
9/4418 . . . . . . . [Suspend and resume; Hibernate and awake]
9/442 . . . . . . . [Shutdown]
9/445 . . . . . . . [Program loading or initiating (bootstrapping G06F 9/4401; security arrangements for program loading or initiating G06F 21/57)]

WARNING

Group G06F 9/445 is impacted by reclassification into groups G06F 21/57 - G06F 21/577.

All groups listed in this Warning should be considered in order to perform a complete search.

9/44505 . . . . . . . [Configuring for program initiating, e.g. using registry, configuration files]
9/4451 . . . . . . . [User profiles; Roaming]
9/44521 . . . . . . . [Dynamic linking or loading; Link editing at or after load time, e.g. Java class loading]
9/44526 . . . . . . . [Plug-ins; Add-ons]
9/44536 . . . . . . . [Selecting among different versions]
9/44542 . . . . . . . [Retargenable]
9/44547 . . . . . . . [Fat binaries]
9/44552 . . . . . . . [Conflict resolution, i.e. enabling coexistence of conflicting executables]
9/44557 . . . . . . . [Code layout in executable memory]
9/44563 . . . . . . . [Sharing]
9/44568 . . . . . . . [Immediately runnable code]
9/44573 . . . . . . . [Execute-in-place [XIP]]
9/44578 . . . . . . . [Preparing or optimising for loading]
9/44584 . . . . . . . [Portable applications, i.e. making applications self-contained, e.g. U3 standard]
9/44589 . . . . . . . [Program code verification, e.g. Java bytecode verification, proof-carrying code (high-level semantic checks G06F 8/43; testing and debugging software G06F 11/36)]
9/44594 . . . . . . . [Unloading]
9/448 . . . . . . . [Execution paradigms, e.g. implementations of programming paradigms]
9/4482 . . . . . . . [Procedural]
9/4484 . . . . . . . [Executing subprograms]
9/4486 . . . . . . . [Formation of subprogram jump address]
9/4488 . . . . . . . [Object-oriented]
9/449 . . . . . . . [Object-oriented method invocation or resolution]
9/4491 . . . . . . . [Optimising based on receiver type]
Operating system execution engines

- Emulation; Interpretation; Software simulation
- { Hypervisors; Virtual machine monitors }
- { Multi-language systems; Localisation; Internationalisation }
- Emulation; Interpretation; Software simulation, e.g. virtualisation or emulation of application or operating system execution engines

Abstract machines for programme code execution, e.g. Java virtual machine [JVM], interpreters, emulators

- { Runtime interpretation or emulation, e.g. emulator loops, bytecode interpretation }
- { Command shells }
- { Runtime code conversion or optimisation }
- { Involving translation to a different instruction set architecture, e.g. just-in-time translation in a JVM }
- Optimisation or modification within the same instruction set architecture, e.g. HP Dynamo
- { Embedded in an application, e.g. JavaScript in a Web browser }
- { Hypervisors; Virtual machine monitors }
- { Provision of facilities of other operating environments, e.g. WINE (I/O emulation G06F 13/105) }
- { Bare-metal, i.e. hypervisor runs directly on hardware }
- { Guest-host, i.e. hypervisor is an application program itself, e.g. VirtualBox }
- { Para-virtualisation, i.e. guest operating system has to be modified }
- { Instruction set architectures of guest OS and hypervisor or native processor differ, e.g. Bochs or VirtualPC on PowerPC MacOS }
- { Hypervisor-specific management and integration aspects }

Creating, deleting, cloning virtual machine instances

Nested virtual machines

Distribution of virtual machine instances; Migration and load balancing

Starting, stopping, suspending or resuming virtual machine instances

I/O management, e.g. providing access to device drivers or storage

Memory management, e.g. access or allocation

Isolation or security of virtual machine instances

Monitoring or debugging support

Network integration; Enabling network access in virtual machine instances

Multiprogramming arrangements

{ Saving or restoring of program or task context }

{ with multiple register sets }

Program control block organisation

{ Distributed object oriented systems (remote method invocation [RMI]) G06F 9/548 }

Transaction processing

{ Transactional memory (G06F 9/528 takes precedence) }

Specific access rights for resources, e.g. using capability register

Program initiating; Program switching, e.g. by interrupt

Task transfer initiation or dispatching

{ by interrupt, e.g. masked }

{ Priority circuits therefor }

{ Interrupt from clock, e.g. time of day }

with variable priority

{ time dependent }

{ by program, e.g. task dispatcher, supervisor, operating system }

{ Task life-cycle, e.g. stopping, restarting, resuming execution (G06F 9/4881 takes precedence) }

{ resumption being on a different machine, e.g. task migration, virtual machine migration (G06F 9/5088 takes precedence) }

{ the task being a mobile agent, i.e. specifically designed to migrate }

{ with creation or replication }

{ with migration policy, e.g. auction, contract negotiation }

{ Scheduling strategies for dispatcher, e.g. round robin, multi-level priority queues }

involving deadlines, e.g. rate based, periodic

{ taking into account power or heat criteria (power management in computers in general G06F 1/3203; thermal management in computers in general G06F 1/206) }

Allocation of resources, e.g. of the central processing unit [CPU]

{ to service a request }

{ the resources being hardware resources other than CPUs, Servers and Terminals }

{ the resource being the memory }

{ Mechanisms to release resources }

{ the resource being a machine, e.g. CPUs, Servers, Terminals }

considering data affinity

considering the execution order of a plurality of tasks, e.g. taking priority or time dependency constraints into consideration (scheduling strategies G06F 9/4881 and subgroups)
G06F

9/505  . . . . [considering software capabilities, i.e. software resources associated or available to the machine]
9/506  . . . . [Partitioning or combining of resources]
9/506  . . . . (Algorithms for mapping a plurality of inter-dependent sub-tasks onto a plurality of physical CPUs (mapping at compile time, see G06F 8/451)]
9/507  . . . . [Grid computing]
9/507  . . . . (Logical partitioning of resources; Management or configuration of virtualized resources (specific details on emulation or internal functioning of virtual machines G06F 9/455)]
9/508  . . . . [Techniques for rebalancing the load in a distributed system]
9/509  . . . . (involving task migration)
9/509  . . . . [where the allocation takes into account power or heat criteria (power management in computers in general G06F 1/3203; thermal management in computers in general G06F 1/206)]
9/52  . . . . Program synchronisation; Mutual exclusion, e.g. by means of semaphores
9/52  . . . . [Barrier synchronisation]
9/52  . . . . [Deadlock detection or avoidance]
9/52  . . . . [Mutual exclusion algorithms]
9/52  . . . . [by using speculative mechanisms]
9/54  . . . . Interprogram communication
9/54  . . . . (via adapters, e.g. between incompatible applications)
9/54  . . . . [Event management; Broadcasting; Multiprogramming; Notifications]
9/54  . . . . [User-generated data transfer, e.g. clipboards, dynamic data exchange [DDE], object linking and embedding [OLE]]
9/54  . . . . [Buffers; Shared memory; Pipes]
9/54  . . . . [where tasks reside in different layers, e.g. user- and kernel-space]
9/54  . . . . [Message passing systems or structures, e.g. queues]
9/54  . . . . [Remote procedure calls [RPC]; Web services]
9/54  . . . . [Object oriented; Remote method invocation [RMI] (non-remote method invocation G06F 9/449)]
11/00  [Error detection; Error correction; Monitoring (error detection, correction or monitoring in information storage based on relative movement between record carrier and transducer G11B 20/18; monitoring, i.e. supervising the progress of recording or reproducing G11B 27/36; in static stores G11C 29/00)]

**NOTE**

In this group the indexing codes of G06F 1/00 - G06F 15/00 are added

11/002  . . . . [protecting against parasitic influences, e.g. noise, temperatures]

**WARNING**

This group is no longer used for the classification of new documents as from January 1, 2011. The documents are classified in G06F 11/07 and subgroups according to the features used for protecting

11/004  . . . . (Error avoidance (G06F 11/07 and subgroups take precedence))
11/006  . . . . (Identification (G06F 11/2289 takes precedence))
11/008  . . . . (Reliability or availability analysis)
11/007  . . . . [Responding to the occurrence of a fault, e.g. fault tolerance]
11/0703  . . . . [Error or fault processing not based on redundancy, i.e. by taking additional measures to deal with the error or fault not making use of redundancy in operation, in hardware, or in data representation]
11/0706  . . . . [the processing taking place on a specific hardware platform or in a specific software environment]
11/0709  . . . . [in a distributed system consisting of a plurality of standalone computer nodes, e.g. clusters, client-server systems]
11/0712  . . . . [in a virtual computing platform, e.g. logically partitioned systems]
11/0715  . . . . [in a system implementing multitasking (multitasking per se G06F 9/46)]
11/0718  . . . . [in an object-oriented system]
11/0721  . . . . [within a central processing unit [CPU]]
11/0724  . . . . [in a multiprocessor or a multi-core unit (multiprocessors per se G06F 15/80)]
11/0727  . . . . [in a storage system, e.g. in a DASD or network based storage system (circuits for error detection or correction within digital recording or reproducing units G11B 20/18; drivers for digital recording or reproducing units G06F 3/06; storage area networks H04L 29/08/59)]
11/073  . . . . [in a memory management context, e.g. virtual memory or cache management (memory management G06F 12/00; testing of static memory units G11C 29/00)]
11/0733  . . . . [in a data processing system embedded in an image processing device, e.g. printer, facsimile, scanner]
11/0736  . . . . [in functional embedded systems, i.e. in a data processing system designed as a combination of hardware and software dedicated to performing a certain function (testing or monitoring of automated control systems G05B 23/02)]
11/0739  . . . . [in a data processing system embedded in automotive or aircraft systems]
11/0742  . . . . [in a data processing system embedded in a mobile device, e.g. mobile phones, handheld devices]
11/0745  . . . . [in an input/output transactions management context (input/output processing in general G06F 13/00)]
Error detection or correction by redundancy in the event of error, e.g. for controlling element

Safety measures, i.e. ensuring safe condition in information, e.g. parity check, casting out 9's or adding special bits or symbols to the coded out-of-m codes

Using codes with inherent redundancy, e.g. n-network context H04L 29/14

in an instruction pipeline G06F 9/3861

G06F 11/1402

G06F 11/36

G06F 11/22

Diagnosis (in a hardware test environment)

Root cause analysis, i.e. error or fault

Error or fault detection not based on

in individual solid state devices (G06F 11/1004 takes precedence)

in a remote unit communicating with a single-box computer node experiencing an error/fault (remote testing G06F 11/2294)

Error or fault detection not based on redundancy (power supply failures G06F 1/30; network fault management H04L 41/06)

by exceeding limits]

by exceeding a count or rate limit, e.g. word- or bit count limit

by bit configuration check, e.g. of formats or tags

Error or fault reporting or storing (reporting or storing of non-error data G06F 11/30; G06F 11/34)

Readable error formats, e.g. cross-platform generic formats, human understandable formats

Means for error signaling, e.g. using interrupts, exception flags, dedicated error registers

Content or structure details of the error report, e.g. specific table structure, specific error fields

Dumping, i.e. gathering error/state information after a fault for later diagnosis

Error filtering or prioritizing based on a policy defined by the user or on a policy defined by a hardware/software module, e.g. according to a severity level

Routing of error reports, e.g. with a specific transmission path or data flow

Storage of error reports, e.g. persistent data storage, storage using memory protection

Root cause analysis, i.e. error or fault diagnosis (in a hardware test environment G06F 11/22; in a software test environment G06F 11/36)

Remedial or corrective actions (by retry G06F 11/1402; recovery from an exception in an instruction pipeline G06F 9/3861; in a network context H04L 29/14)

Safety measures, i.e. ensuring safe condition in the event of error, e.g. for controlling element

Error detection or correction by redundancy in data representation, e.g. by using checking codes

Using codes with inherent redundancy, e.g. n-out-of-m codes

Adding special bits or symbols to the coded information, e.g. parity check, casting out 9's or 11's

To protect a block of data words, e.g. CRC or checksum (G06F 11/1076 takes precedence; security arrangements for protecting computers or computer systems against unauthorized activity G06F 21/00)

in individual solid state devices (G06F 11/1004 takes precedence)

Using codes or arrangements adapted for a specific type of error (G06F 11/1048 takes precedence)

Error in accessing a memory location, i.e. addressing error

Error in check bits

Identification of the type of error

Adjacent errors, e.g. error in n-bit (n>1) wide storage units, i.e. package error

Simple parity

Unidirectional errors

using arithmetic codes, i.e. codes which are preserved during operation, e.g. modulo 9 or 11 check

with specific ECC/EDC distribution

using arrangements adapted for a specific error detection or correction feature

Bypassing or disabling error detection or correction

Updating check bits on partial write, i.e. read/modify/write

Correcting systematically all correctable errors, i.e. scrubbing

in cache or content addressable memories

in sector programmable memories, e.g. flash disk (G06F 11/1072 takes precedence)

in multilevel memories

Parity data used in redundant arrays of independent storages, e.g. in RAID systems

Parity data distribution in semiconductor storages, e.g. in SSD

Reconstruction on already foreseen single or plurality of spare disks

Rebuilding, e.g. when physically replacing a failing disk

Parity calculation or recalculation after configuration or reconfiguration of the system

Error detection or correction of the data by redundancy in operation (G06F 11/16 takes precedence)

Saving, restoring, recovering or retrying

at machine instruction level

Checking the instruction stream

for bus or memory accesses

at system level

Boot up procedures

Reconfiguring to eliminate the error (group management mechanisms in a peer-to-peer network H04L 67/1044)

by reconfiguration of paths

by reconfiguration of node membership

with loss of hardware functionality

with loss of software functionality

during software upgrading

using file system or storage system metadata

Restarting or rejuvenating

Resetting or repowering

Transmit or communication errors

Point-in-time backing up or restoration of persistent data
Error detection or correction of the data by redundant processing systems

Error detection by comparing the output of counters or frequency dividers

Circuits for correct operation

Transducer for correct operation

Relative movement between record carrier and transducer

Error detection in communications, e.g. transmission, interfaces

Error detection by comparing the output of redundant processing systems

Using mutual exchange of the output between the redundant processing components

Using additional compare functionality in one or some but not all of the redundant processing components

Error detection by comparing the output of redundant processing components

Management of the backup or restore process

Backup scheduling policy

For networked environments

To make the backup process non-disruptive

Backup restoration techniques

Involving logging of persistent data for recovery

[Details of time redundant execution on a single processing unit]

Error detection or correction of the data by redundancy in hardware

[where the fault affects the clock signals of a processing unit and the redundancy is at or within the level of clock signal generation hardware]

Error detection by comparing the output signals of redundant hardware

Error detection or correction in information storage based on relative movement between record carrier and transducer

Checking static stores for correct operation

For logic circuits

For pulse counters or frequency dividers

[where the redundant component is persistent storage]

[where the redundant component is an I/O device or an adapter therefor]

Displays

In communications, e.g. transmission, interfaces

Error detection by comparing the output of redundant processing systems

Using mutual exchange of the output between the redundant processing components

Using additional compare functionality in one or some but not all of the redundant processing components

[where the comparison is not performed by the redundant processing components]

[and the comparison itself uses redundant hardware]

[with continued operation after detection of the error]

[where the output of only one of the redundant processing components can drive the attached hardware, e.g. memory or I/O]

Data re-synchronization of a redundant component, or initial sync of replacement, additional or spare unit

The resynchronized component or unit being a persistent storage device

Re-synchronization of failed mirror storage

Rebuild or reconstruction of parity RAID storage

[where the redundant component is memory or memory area]

Error detection by comparing the memory output

Temporal synchronisation or re-synchronisation of redundant processing components

[at clock signal level]

[at instruction level]

[at event level, e.g. by interrupt or result of polling]

[using a quantum]

[which are operating with time diversity]

Using passive fault-masking of the redundant circuits

Error detection by comparing the output of redundant processing systems with continued operation after detection of the error

Eliminating the failing redundant component

Based on mutual exchange of the output between redundant processing components

By voting, the voting not being performed by the redundant components

Where the redundant components implement processing functionality

And the voting is itself performed redundantly

Passive fault masking when reading multiple copies of the same data

Voting techniques

Where exact match is not required

Using active fault-masking, e.g. by switching out faulty elements or by switching in spare elements

[where interconnections or communication control functionality are redundant]

Flexible arrangements for bus networks involving redundancy

Using redundant communication controllers

Using redundant communication media

{between storage system components}

{and using different communication protocols}

{Redundant power supplies (power supply failure G06F 1/30)}
11/2017 . . . . [where memory access, memory control or I/O control functionality is redundant. (redundant communication control functionality G06F 11/2005; redundant storage control functionality G06F 11/2089)]

11/202 . . . . [where processing functionality is redundant (redundant communication control functionality G06F 11/2005; redundant storage control functionality G06F 11/2089)]

11/2023 . . . . [Faioler techniques]
11/2025 . . . . [using centralised failover control functionality]
11/2028 . . . . [eliminating a faulty processor or activating a spare]
11/203 . . . . [using migration]
11/2033 . . . . [switching over of hardware resources]
11/2035 . . . . [without idle spare hardware]
11/2038 . . . . [with a single idle spare processing component]
11/2041 . . . . [with more than one idle spare processing component]
11/2043 . . . . [where the redundant components share a common memory address space]
11/2046 . . . . [where the redundant components share persistent storage (G06F 11/2043 takes precedence)]
11/2048 . . . . [where the redundant components share neither address space nor persistent storage]
11/2051 . . . . [in regular structures]
11/2053 . . . . [where persistent mass storage functionality or persistent mass storage control functionality is redundant (error detection or correction in information storage based on relative movement between record carrier and transducer G11B 20/18)]

11/2056 . . . . [by mirroring]
11/2058 . . . . [using more than 2 mirrored copies]
11/2061 . . . . [combined with de-clustering of data]
11/2064 . . . . [while ensuring consistency]
11/2066 . . . . [Optimisation of the communication load]
11/2069 . . . . [Management of state, configuration or failover]
11/2071 . . . . [using a plurality of controllers]
11/2074 . . . . [Asynchronous techniques]
11/2076 . . . . [Synchronous techniques]
11/2079 . . . . [Bidirectional techniques]
11/2082 . . . . [Data synchronisation]
11/2084 . . . . [on the same storage unit]
11/2087 . . . . [with a common controller]
11/2089 . . . . [Redundant storage control functionality]
11/2092 . . . . [Techniques of failing over between control units]
11/2094 . . . . [Redundant storage or storage space (G06F 11/2056 takes precedence)]
11/2097 . . . . [maintaining the standby controller/process unit updated (initialisation or resynchronisation thereof G06F 11/1658 and subgroups)]

11/22 . . . . Detection or location of defective computer hardware by testing during standby operation or during idle time, e.g. start-up testing

11/2205 . . . . [using arrangements specific to the hardware being tested]
11/221 . . . . [to test buses, lines or interfaces, e.g. stuck-at or open line faults]
11/2215 . . . . [to test error correction or detection circuits]
11/2221 . . . . [to test input/output devices or peripheral units]
11/2226 . . . . [to test ALU]
11/2231 . . . . [to test interrupt circuits]
11/2236 . . . . [to test CPU or processors]
11/2242 . . . . [in multi-processor systems, e.g. one processor becoming the test master (G06F 11/2736 takes precedence)]
11/2247 . . . . [Verification or detection of system hardware configuration]
11/2252 . . . . [using fault dictionaries]
11/2257 . . . . [using expert systems]
11/2263 . . . . [using neural networks]
11/2268 . . . . [Logging of test results]
11/2273 . . . . [Test methods]
11/2011/2278 . . . . [Power-On Test, e.g. POST]
11/2284 . . . . [by power-on test, e.g. power-on self test [POST]]
11/2289 . . . . [by configuration test]
11/2294 . . . . [by remote test]
11/24 . . . . Marginal checking [or other specified testing methods not covered by G06F 11/26, e.g. race tests]
11/25 . . . . Testing of logic operation, e.g. by logic analysers
11/26 . . . . Functional testing
11/261 . . . . [by simulating additional hardware, e.g. fault simulation]
11/263 . . . . [Generation of test inputs, e.g. test vectors, patterns or sequences [with adaptation of the tested hardware for testability with external testers]
11/2635 . . . . [using a storage for the test inputs, e.g. test ROM, script files]
11/267 . . . . [Reconfiguring circuits for testing, e.g. LSSD, partitioning]
11/27 . . . . [Built-in tests]
11/273 . . . . [Tester hardware, i.e. output processing circuits (G06F 11/263 takes precedence)]
11/2733 . . . . [Test interface between tester and unit under test]
11/2736 . . . . [using a dedicated service processor for test]
11/277 . . . . [with comparison between actual response and known fault-free response]
11/28 . . . . by checking the correct order of processing (G06F 11/08 - G06F 11/26 take precedence; monitoring patterns of pulse trains H03K 5/19)
11/30 . . . . Monitoring
11/3003 . . . . [Monitoring arrangements especially adapted to the computing system or computing system component being monitored]
11/3006 . . . . [where the computing system is distributed, e.g. networked systems, clusters, multiprocessor systems (multiprogramming arrangements G06F 9/46; allocation of resources G06F 9/50)]
11/301 . . . . [where the computing system is a virtual computing platform, e.g. logically partitioned systems (virtual machines G06F 9/45533; logical partitioning of resources G06F 9/5077)]
G06F

11/3013 . . . {where the computing system is an embedded system, i.e. a combination of hardware and software dedicated to perform a certain function in mobile devices, printers, automotive or aircraft systems (testing or monitoring of control systems or parts thereof G05B 23/02)}

11/3017 . . . {where the computing system is implementing multitasking (multiprogramming arrangements G06F 9/46; allocation of resources G06F 9/50)}

11/302 . . . {where the computing system component is a software system}

11/3024 . . . {where the computing system component is a central processing unit [CPU]}

11/3027 . . . {where the computing system component is a bus}

11/3031 . . . {where the computing system component is a motherboard or an expansion card}

11/3034 . . . {where the computing system component is a storage system, e.g. DASD based or network based (digital recording or reproducing G11B 20/18; digital input from or digital output to record carriers G06F 3/06; arrangements and networking functions for distributed storage of data in a network H04L 29/08549)}

11/3037 . . . {where the computing system component is a memory, e.g. virtual memory, cache (accessing, addressing or allocating within memory systems or architectures G06F 12/00; checking stores for correct operation G11C 29/00)}

11/3041 . . . {where the computing system component is an input/output interface (interconnection of, or transfer of information or other signals between, memories, input/output devices or central processing units G06F 13/00)}

11/3044 . . . {where the computing system component is the mechanical casing of the computing system}

11/3048 . . . {where the topology of the computing system or computing system component explicitly influences the monitoring activity, e.g. serial, hierarchical systems}

11/3051 . . . {Monitoring arrangements for monitoring the configuration of the computing system or of the computing system component, e.g. monitoring the presence of processing resources, peripherals, I/O links, software programs (verification or detection of system hardware configuration G06F 11/2247)}

11/3055 . . . {Monitoring arrangements for monitoring the status of the computing system or of the computing system component, e.g. monitoring if the computing system is on, off, available, not available (error or fault processing without redundancy G06F 11/0703; error detection or correction by redundancy in data representation G06F 11/08; error detection or correction by redundancy in operation G06F 11/14; error detection or correction by redundancy in hardware G06F 11/16)}

11/3058 . . . {Monitoring arrangements for monitoring environmental properties or parameters of the computing system or of the computing system component, e.g. monitoring of power, currents, temperature, humidity, position, vibrations (thermal management in cooling arrangements of a computing system G06F 1/206)}

11/3062 . . . {where the monitored property is the power consumption (power management in a computing system G06F 1/3203)}

11/3065 . . . {Monitoring arrangements determined by the means or processing involved in reporting the monitored data (error or fault reporting or logging G06F 11/0766)}

11/3068 . . . {where the reporting involves data format conversion}

11/3072 . . . {where the reporting involves data filtering, e.g. pattern matching, time or event triggered, adaptive or policy-based reporting}

11/3075 . . . {the data filtering being achieved in order to maintain consistency among the monitored data, e.g. ensuring that the monitored data belong to the same timeframe, to the same system or component}

11/3079 . . . {the data filtering being achieved by reporting only the changes of the monitored data}

11/3082 . . . {the data filtering being achieved by aggregating or compressing the monitored data}

11/3086 . . . {where the reporting involves the use of self describing data formats, i.e. metadata, markup languages, human readable formats}

11/3089 . . . {Monitoring arrangements determined by the means or processing involved in sensing the monitored data, e.g. interfaces, connectors, sensors, probes, agents (software debugging using additional hardware using a specific debug interface G06F 11/3656; performance evaluation by tracing or monitoring G06F 11/3466)}

11/3093 . . . {Configuration details thereof, e.g. installation, enabling, spatial arrangement of the probes}

11/3096 . . . {wherein the means or processing minimize the use of computing system or of computing system component resources, e.g. non-intrusive monitoring which minimizes the probe effect: sniffing, intercepting, indirectly deriving the monitored data from other directly available data}

11/32 . . . with visual [or acoustical] indication of the functioning of the machine

11/321 . . . {Display for diagnostics, e.g. diagnostic result display, self-test user interface}

11/322 . . . {Display of waveforms, e.g. of logic analysers (G06F 11/323 takes precedence)}

11/323 . . . {Visualisation of programs or trace data}

11/324 . . . {Display of status information}

11/325 . . . {by lamps or LED's}

11/326 . . . {for error or online/offline status}

11/327 . . . {Alarm or error message display}

11/328 . . . {Computer systems status display (G06F 11/327 takes precedence)}

11/34 . . . {Recording or statistical evaluation of computer activity, e.g. of down time, of input/output operation; Recording or statistical evaluation of user activity, e.g. usability assessment}

11/3404 . . . {for parallel or distributed programming}

11/3409 . . . {for performance assessment}

11/3414 . . . {Workload generation, e.g. scripts, playback}

11/3419 . . . {by assessing time}
11/3423 . . . . { Benchmarking }
11/3428 . . . . { for load management (allocation of a server based on load conditions G06F 9/505; load rebalancing G06F 9/5083; redistributing the load in a network by a load balancer H04L 67/1029) }
11/3438 . . . . { monitoring of user actions (checking the network activity of the user for network-specific applications H04L 67/22) }
11/3442 . . . . { for planning or managing the needed capacity }
11/3447 . . . . { Performance evaluation by modeling }
11/3452 . . . . { Performance evaluation by statistical analysis }
11/3457 . . . . { Performance evaluation by simulation }
11/3461 . . . . { Trace driven simulation }
11/3466 . . . . { Performance evaluation by tracing or monitoring }
11/3471 . . . . [ Address tracing ]
11/3476 . . . . { Data logging (G06F 11/14, G06F 11/2205 take precedence) }
11/348 . . . . { Circuit details, i.e. tracer hardware }
11/3485 . . . . [ for I/O devices ]
11/349 . . . . [ for interfaces, busses ]
11/3495 . . . . [ for systems ]
11/36 . Preventing errors by testing or debugging software
11/3604 . . . . { Software analysis for verifying properties of programs (byte-code verification G06F 9/44589) }
11/3608 . . . . { using formal methods, e.g. model checking, abstract interpretation (theorem proving G06N 5/006) }
11/3612 . . . . [ by runtime analysis (performance monitoring G06F 11/3466) ]
11/3616 . . . . [ using software metrics ]
11/362 . . . . [ Software debugging ]
11/3624 . . . . [ by performing operations on the source code, e.g. via a compiler ]
11/3628 . . . . [ of optimised code (optimisation G06F 8/443) ]
11/3632 . . . . [ of specific synchronisation aspects ]
11/3636 . . . . [ by tracing the execution of the program ]
11/364 . . . . [ tracing values on a bus ]
11/3644 . . . . [ by instrumenting at runtime ]
11/3648 . . . . [ using additional hardware ]
11/3652 . . . . [ in-circuit-emulation [ICE] arrangements ]
11/3656 . . . . [ using a specific debug interface ]
11/366 . . . . [ using diagnostics (G06F 11/0703 takes precedence) ]
11/3664 . . . . [ Environments for testing or debugging software ]
11/3668 . . . . [ Software testing (software testing in telephone exchanges H04M 3/242, testing of hardware G06F 11/22) ]
11/3672 . . . . [ Test management ]
11/3676 . . . . [ for coverage analysis ]
11/368 . . . . [ for test version control, e.g. updating test cases to a new software version ]
11/3684 . . . . [ for test design, e.g. generating new test cases ]
11/3688 . . . . [ for test execution, e.g. scheduling of test suites ]
11/3692 . . . . [ for test results analysis ]
11/3696 . . . . [ Methods or tools to render software testable ]

12/00 Accessing, addressing or allocating within memory systems or architectures (digital input from, or digital output to record carriers, e.g. to disk storage units, G06F 3/06)
12/02 . Addressing or allocation; Relocation (program address sequencing G06F 9/00; arrangements for selecting an address in a digital store G11C 8/00)
12/0207 . [ with multidimensional access, e.g. row/column, matrix ]
12/0215 . [ with look ahead addressing means ]
12/0223 . [ User address space allocation, e.g. contiguous or non contiguous base addressing ]
12/023 . [ Free address space management ]
12/0238 . . . . [ Memory management in non-volatile memory, e.g. resistive RAM or ferroelectric memory ]
12/0246 . . . . [ in block erasable memory, e.g. flash memory ]
12/0253 . . . . [ Garbage collection, i.e. reclamation of unreferenced memory ]
12/0261 . . . . [ using reference counting ]
12/0269 . . . . [ Incremental or concurrent garbage collection, e.g. in real-time systems (G06F 12/0261 takes precedence) ]
12/0276 . . . . [ Generational garbage collection ]
12/0284 . . . . [ Multiple user address space allocation, e.g. using different base addresses (interprocessor communication G06F 15/163) ]
12/0292 . . . . [ using tables or multilevel address translation means (G06F 12/023 takes precedence; address translation in virtual memory systems G06F 12/10) ]
12/04 . . . . Addressing variable-length words or parts of words
12/06 . . . . Addressing a physical block of locations, e.g. base addressing, module addressing, memory dedication (G06F 12/08 takes precedence)

NOTE
This group is limited to Module addressing or allocation; base addressing is classified in G06F 12/023.

12/0607 . . . . [ Interleaved addressing ]
12/0615 . . . . [ Address space extension ]
12/0623 . . . . [ for memory modules ]
12/063 . . . . [ for I/O modules, e.g. memory mapped I/O (I/O protocol G06F 13/42) ]
12/0638 . . . . [ Combination of memories, e.g. ROM and RAM such as to permit replacement or supplementing of words in one module by words in another module (address formation of the next microinstruction G06F 9/26; masking faults in memories by using spares or by reconfiguring G11C 29/70) ]
12/0646 . . . . [ Configuration or reconfiguration ]
12/0653 . . . . [ with centralised address assignment ]
12/0661 . . . . [ and decentralised selection ]
12/0669 . . . . [ with decentralised address assignment ]
12/0676 . . . . [ the address being position dependent ]
12/0684 . . . . [ with feedback, e.g. presence or absence of unit detected by addressing, overflow detection ]
12/0692 . . . . [ Multiconfiguration, e.g. local and global addressing ]
virtual memory systems

Addressing of a memory level in which the access to the desired data or data block requires associative addressing means, e.g. caches

Multiuser, multiprocessor or multiprocessing cache systems

with cache invalidating means

with multilevel cache hierarchies

with a network or matrix configuration

Cache consistency protocols

using directory methods

[Associative directories]

[Copy directories (local copy tags for implementing a bus snooping protocol)]

[Distributed directories, e.g. linked lists of caches]

[Limited pointers directories; Stateless directories without pointers]

[with concurrent directory accessing, i.e. handling multiple concurrent coherency transactions]

using a bus scheme, e.g. with bus monitoring or watching means

[in combination with broadcast means (e.g. for invalidation or updating)]

[for main memory peripheral accesses (e.g. I/O or DMA)]

with software control, e.g. non-cacheable data

with a shared cache

for multiprocessor or multitasking

Multiple simultaneous or quasi-simultaneous cache accessing

Cache with multiple tag or data arrays being simultaneously accessible

[Partitioned cache, e.g. separate instruction and operand caches]

[Cache with interleaved addressing]

[Cache with multiport tag or data arrays]

Overlapped cache accessing, e.g. pipeline

[by multiple requestors]

[with reload from main memory]

with prefetch

using pseudo-associative means, e.g. set-associative or hashing

for peripheral storage systems, e.g. disk cache

Data transfer between cache memory and other subsystems, e.g. storage devices or host systems

Allocation or management of cache space

Mapping of cache memory to specific storage devices or parts thereof

with dedicated cache, e.g. instruction or stack

Cache access modes

Burst mode

Page mode

Parallel mode, e.g. in parallel with main memory or CPU

Variable-length word access

using selective caching, e.g. bypass

using clearing, invalidating or resetting means

Caches characterised by their organisation or structure

of parts of caches, e.g. directory or tag array

with two or more cache hierarchy levels

Address translation

using page tables, e.g. page table structures

involving hashing techniques, e.g. inverted page tables

using associative or pseudo-associative address translation means, e.g. translation look-aside buffer [TLB]

for multiple virtual address spaces, e.g. segmentation

associated with a data cache

{the data cache being concurrently physically addressed}

{the data cache being concurrently virtually addressed}

Decentralised address translation, e.g. in distributed shared memory systems

for peripheral access to main memory, e.g. direct memory access [DMA]

for multiple virtual address spaces, e.g. segmentation

Replacement control

using replacement algorithms

of the least frequently used [LFU] type, e.g. with individual count value

with age lists, e.g. queue, most recently used [MRU] list or least recently used [LRU] list

{being minimized, e.g. non MRU}

{being generated by decoding an array or storage}

with special data handling, e.g. priority of data or instructions, handling errors or pinning

using additional replacement algorithms

adapted to multidimensional cache systems, e.g. set-associative, multicache, multiset or multilevel

Protection against unauthorised use of memory {or access to memory}

(by using cryptography [digital transmission])

(by checking the object accessibility, e.g. type of access defined by the memory independently of subject rights)

{the protection being physical, e.g. cell, word, block}

{for a module or a part of a module}

{for a range}
13/00 Interconnection of, or transfer of information or other signals between, memories, input/output devices or central processing units (interface circuits for specific input/output devices G06F 3/00; multiprocessor systems G06F 15/16 (multiprogram control therefor G06F 9/46))

13/10 Program control for peripheral devices (G06F 13/14 - G06F 13/42 take precedence)

13/16 . Handling requests for interconnection or transfer for access to memory bus (G06F 13/28 takes precedence)

13/1605 . [based on arbitration (arbitration in handling access to a common bus or bus system G06F 13/36)]

13/161 . [with latency improvement]

13/1615 . [using a concurrent pipeline structure]

13/1621 . [by maintaining request order]

13/1626 . [by reordering requests]

13/1631 . [through address comparison]

13/1636 . [using refresh]

13/1642 . [with request queuing]

13/1647 . [with interleaved bank access]

13/1652 . [in a multiprocessor architecture (interprocessor communication using common memory G06F 15/167)]

13/1657 . [Access to multiple memories]

13/1663 . [Access to shared memory]

13/1668 . [Details of memory controller]

13/1673 . [using buffers]

13/1678 . [using bus width]

13/1684 . [using multiple buses]

13/1689 . [Synchronisation and timing concerns (synchronisation on a memory bus G06F 13/4234)]

13/1694 . [Configuration of memory controller to different memory types]

13/18 . based on priority control (G06F 13/1605 takes precedence)

13/20 . for access to input/output bus

13/22 . using successive scanning, e.g. polling (G06F 13/24 takes precedence)

13/225 . [with priority control]

13/24 . using interrupt (G06F 13/32 takes precedence)

13/26 . with priority control

13/28 . using burst mode transfer, e.g. direct memory access (DMA), cycle steal (G06F 13/32 takes precedence)

13/282 . [Cycle stealing DMA (G06F 13/30 takes precedence)]

13/285 . [Halt stealing DMA (G06F 13/30 takes precedence)]

13/287 . [Multiplexed DMA (G06F 13/30 takes precedence)]

13/30 . with priority control

13/32 . using combination of interrupt and burst mode transfer

13/34 . with priority control

13/36 . for access to common bus or bus system

13/362 . with centralised access control

13/3625 . [using a time dependent access]

13/364 . using independent requests or grants, e.g. using separated request and grant lines

13/366 . using a centralised polling arbiter

13/368 . with decentralised access control

13/37 . using a physical-position-dependent priority, e.g. daisy chain, round robin or token passing

13/372 . using a time-dependent priority, e.g. individually loaded time counters or time slot

13/374 . using a self-select method with individual priority code comparator

13/376 . using a contention resolving method, e.g. collision detection, collision avoidance

13/378 . using a parallel poll method

13/38 . Information transfer, e.g. on bus (G06F 13/14 takes precedence)

13/382 . [using universal interface adapter]

13/385 . [for adaptation of a particular data processing system to different peripheral devices]

13/387 . [for adaptation of different data processing systems to different peripheral devices, e.g. protocol converters for incompatible systems, open system]

13/40 . Bus structure (for computer networks G06F 15/163; for optical bus networks H04B 10/25)

13/4004 . [Coupling between buses]

13/4009 . [with data restructuring]

13/4013 . [with data re-ordering, e.g. Endian conversion]

13/4018 . [with data-width conversion]

13/4022 . [using switching circuits, e.g. switching matrix, connection or expansion network (G06F 13/4009 takes precedence)]

13/4027 . [using bus bridges (G06F 13/4022 takes precedence)]
Digital computers in general (details G06F 9/00 – G06F 13/00): Data processing equipment in general

15/00

15/02 . . . manually operated with input through keyboard and computation using a built-in program, e.g. pocket calculators

15/0208 . . . [for combination with other devices having a different main function, e.g. watches, pens]
15/0216 . . . [Constructional details or arrangements]
15/0225 . . . [User interface arrangements, e.g. keyboard, display; Interfaces to other computer systems]
15/0233 . . . [with printing provisions]
15/0241 . . . [of the IC-card-like type]
15/025 . . . [adapted to a specific application]
15/0258 . . . [for unit conversion]
15/0266 . . . [for time management, e.g. calendars, diaries]
15/0275 . . . [for measuring]
15/0283 . . . [for data storage and retrieval]
15/0291 . . . [for reading, e.g. e-books (constructional details of portable computers G06F 1/1613)]
15/04 . programme simultaneously with the introduction of data to be processed, e.g. on the same record carrier
15/08 . . . using a plugboard for programming
15/10 . . . Tabulators
15/12 . . . having provision for both printed and punched output
15/14 . . . Calculating-punches
15/16 . . . Combinations of two or more digital computers each having at least an arithmetic unit, a program unit and a register, e.g. for a simultaneous processing of several programs {coordinating program control therefor G06F 9/52; in regulating and control system G05B)}
15/161 . . . [Computing infrastructure, e.g. computer clusters, blade chassis or hardware partitioning (casings, cabinets, racks or drawers for data centers H05K 5/00)]
15/163 . . . Interprocessor communication
15/167 . . . . using a common memory, e.g. mailbox
15/17 . . . . using an input/output type connection, e.g. channel, I/O port
15/173 . . . . using an interconnection network, e.g. matrix, shuffle, pyramid, star, snowflake
15/17306 . . . [Intercommunication techniques]
15/17312 . . . . [Routing techniques specific to parallel machines, e.g. wormhole, store and forward, shortest path problem congestion (routing on a LAN H04L 45/00)]
15/17318 . . . . [Parallel communications techniques, e.g. gather, scatter, reduce, broadcast, multicast, all to all]
15/17325 . . . . [Synchronisation; Hardware support therefor (intertask synchronisation G06F 9/52)]
15/17331 . . . . [Distributed shared memory [DSM], e.g. remote direct memory access [RDMA]]
15/17337 . . . . [Direct connection machines, e.g. completely connected computers, point to point communication networks (coupling between buses G06F 13/4004)]
15/17343 . . . . . [wherein the interconnection is dynamically configurable, e.g. having loosely coupled nearest neighbor architecture (reconfigurable processors arrays G06F 15/7867)]
15/1735 . . . . [Network adapters, e.g. SCI, Myrinet (protocol engines H04L 29/06081)]
15/17356 . . . . [Indirect interconnection networks]
15/17362 . . . . [hierarchical topologies]
15/17368 . . . . {non hierarchical topologies}
15/17375 . . . . {One dimensional, e.g. linear array, ring}
15/17381 . . . . {Two dimensional, e.g. mesh, torus}
15/17387 . . . . {Three dimensional, e.g. hypercubes}
15/17393 . . . . {having multistage networks, e.g. broadcasting scattering, gathering, hot spot contention, combining/ decombing}
15/177 . . . . {Initialisation or configuration control} (processor initialisation G06F 9/4405)
15/76 . . . . {Architectures of general purpose stored program computers (with program plugboard G06F 15/08; multicomputers G06F 15/16)
15/761 . . . . {Indexing scheme relating to architectures of general purpose stored programme computers}
15/763 . . . . {ASIC}
15/765 . . . . {Cache}
15/766 . . . . {Flash EPROM}
15/768 . . . . {Gate array}
15/78 . . . . {comprising a single central processing unit}
15/7803 . . . . {System on board, i.e. computer system on one or more PCB, e.g. motherboards, daughterboards or blades}
15/7807 . . . . {System on chip, i.e. computer system on a single chip; System in package, i.e. computer system on one or more chips in a single package}
15/781 . . . . {On-chip cache; Off-chip memory}
15/7814 . . . . {Specially adapted for real time processing, e.g. comprising hardware timers}
15/7817 . . . . {Specially adapted for signal processing, e.g. Harvard architectures}
15/7821 . . . . {Tightly coupled to memory, e.g. computational memory, smart memory, processor in memory}
15/7825 . . . . {Globally asynchronous, locally synchronous, e.g. network on chip}
15/7828 . . . . {without memory}
15/7832 . . . . {on one IC chip (single chip microprocessors)}
15/7835 . . . . {on more than one IC chip}
15/7839 . . . . {with memory}
15/7842 . . . . {on one IC chip (single chip microcontrollers)}
15/7846 . . . . {On-chip cache and off-chip main memory}
15/785 . . . . {with decentralized control, e.g. smart memories}
15/7853 . . . . {including a ROM}
15/7857 . . . . {using interleaved memory (addressing G06F 12/0607)}
15/786 . . . . {using a single memory module}
15/7864 . . . . {on more than one IC chip}
15/7867 . . . . {with reconfigurable architecture}
15/7871 . . . . {Reconfiguration support, e.g. configuration loading, configuration switching, or hardware OS}
15/7875 . . . . {for multiple contexts}
15/7878 . . . . {for pipeline reconfiguration}
15/7882 . . . . {for self reconfiguration}
15/7885 . . . . {Runtime interface, e.g. data exchange, runtime control}
15/7889 . . . . {Reconfigurable logic implemented as a co-processor (instruction execution using a co-processor G06F 9/3877)}
15/7892 . . . . {Reconfigurable logic embedded in CPU, e.g. reconfigurable unit}
15/7896 . . . . {Modular architectures, e.g. assembled from a number of identical packages}
15/80 . . . . {comprising an array of processing units with common control, e.g. single instruction multiple data processors (G06F 15/82 takes precedence ; for correlation function computation G06F 17/15)}
15/8007 . . . . {single instruction multiple data [SIMD] multiprocessors}
15/8015 . . . . {One dimensional arrays, e.g. rings, linear arrays, buses}
15/8023 . . . . {Two dimensional arrays, e.g. mesh, torus}
15/803 . . . . {Three-dimensional arrays or hypercubes}
15/8038 . . . . {Associative processors}
15/8046 . . . . {Systolic arrays}
15/8053 . . . . {Vector processors}
15/8061 . . . . {Details on data memory access}
15/8069 . . . . {using a cache}
15/8076 . . . . {Details on data register access}
15/8084 . . . . {Special arrangements thereof, e.g. mask or switch}
15/8092 . . . . {Array of vector units}
15/82 . . . . {data or demand driven}
15/825 . . . . {Dataflow computers}
16/00 Information retrieval; Database structures therefor; File system structures therefor
16/10 . . . . {File systems; File servers}
16/11 . . . . {File system administration, e.g. details of archiving or snapshots (file system backup G06F 11/14)}
16/113 . . . . {Details of archiving (lifecycle management in storage systems G06F 3/0649; backup systems G06F 11/1446)}
16/116 . . . . {Details of conversion of file system types or formats}
16/119 . . . . {Details of migration of file systems (migration mechanisms in storage systems G06F 3/0647)}
16/122 . . . . {using management policies (backup systems G06F 11/1446; file migration policies for HSM systems G06F 16/185)}
16/125 . . . . {characterised by the use of retention policies (retention policies for HSM systems G06F 16/185)}
16/128 . . . . {Details of file system snapshots on the file-level, e.g. snapshot creation, administration, deletion (use of snapshots for error detection or correction G06F 11/14, G06F 11/16)}
16/13 . . . . {File access structures, e.g. distributed indices (arrangements of input from, or output to, record carriers G06F 3/06)}
16/134 . . . . {Distributed indices}
16/137 . . . . {Hash-based (content-based indexing of textual data G06F 16/31)}
16/14 . . . . {Details of searching files based on file metadata}
16/144 . . . . {Query formulation}
16/148 . . . . {File search processing}
16/152 . . . . {using file content signatures, e.g. hash values}
G06F

16/156 . . . [Query results presentation]
16/16 . . . File or folder operations, e.g. details of user interfaces specifically adapted to file systems
16/162 . . . [Delete operations (erasing in storage systems G06F 3/0652)]
16/164 . . . [File meta data generation]
16/166 . . . [File name conversion]
16/168 . . . [Details of user interfaces specifically adapted to file systems, e.g. browsing and visualisation, 2d or 3d GUIs (query results presentation G06F 16/156)]
16/17 . . . Details of further file system functions
16/172 . . . Caching, prefetching or hoarding of files
16/1724 . . . [Details of de-fragmentation performed by the file system (saving storage space on storage systems G06F 3/0608; management of blocks in storage devices G06F 3/0641)]
16/1727 . . . [Details of free space management performed by the file system (saving storage space on storage systems G06F 3/0608; management of blocks in storage devices G06F 3/0641)]
16/173 . . . [Customisation support for file systems, e.g. localisation, multi-language support, personalisation]
16/1734 . . . [Details of monitoring file system events, e.g. by the use of hooks, filter drivers, logs]
16/1737 . . . [for reducing power consumption or coping with limited storage space, e.g. in mobile devices (saving storage space on storage devices G06F 3/0608; power saving in storage systems G06F 3/0625)]
16/174 . . . Redundancy elimination performed by the file system (management of the data involved in backup or backup restore using de-duplication of the data G06F 11/14)]
16/1744 . . . [using compression, e.g. sparse files]
16/1748 . . . [De-duplication implemented within the file system, e.g. based on file segments (de-duplication techniques in storage systems for the management of data blocks G06F 3/0641)]
16/1752 . . . . . [based on file chunks]
16/1756 . . . . . [based on delta files]
16/176 . . . Support for shared access to files; File sharing support
16/1767 . . . . . [Concurrency control, e.g. optimistic or pessimistic approaches]
16/1774 . . . . . [Locking methods, e.g. locking methods for file systems allowing shared and concurrent access to files]
16/178 . . . Techniques for file synchronisation in file systems
16/1787 . . . . [Details of non-transparently synchronising file systems]
16/1794 . . . . [Details of file format conversion]

**WARNING**

Group G06F 16/1794 is impacted by reclassification into group G06F 16/258.
Groups G06F 16/1794 and G06F 16/258 should be considered in order to perform a complete search.

16/18 . . . File system types

16/1805 . . . [Append-only file systems, e.g. using logs or journals to store data]
16/181 . . . . [providing write once read many [WORM] semantics]
16/1815 . . . [Journaling file systems]
16/182 . . . Distributed file systems
16/1824 . . . [implemented using Network-attached Storage [NAS] architecture (distributed or networked storage systems G06F 3/067; protocols for distributed storage of data in a network H04L 67/1097)]
16/1827 . . . . [Management specifically adapted to NAS (management of storage area networks [SAN] G06F 3/067)]
16/183 . . . . [Providing of network file services by network file servers, e.g. by using NFS, CIFS (network file access protocols H04L 67/1097)]
16/1834 . . . . [implemented based on peer-to-peer networks, e.g. gnutella (p2p communication protocols H04L 67/104)]
16/1837 . . . . [Management specially adapted to peer-to-peer storage networks (topology management mechanisms of peer-to-peer networks H04L 67/104)]
16/184 . . . . . [implemented as replicated file system]
16/1844 . . . . . [Management specifically adapted to replicated file systems]
16/1847 . . . . . [specifically adapted to static storage, e.g. adapted to flash memory or SSD]
16/185 . . . . . [Hierarchical storage management [HSM] systems, e.g. file migration or policies thereof (details of archived G06F 16/11)]
16/1858 . . . . [Parallel file systems, i.e. file systems supporting multiple processors]
16/1865 . . . . [Transactional file systems]
16/1873 . . . . [Versioning file systems, temporal file systems, e.g. file system supporting different historic versions of files]
16/188 . . . . . . [Virtual file systems]
16/192 . . . . . . [Implementing virtual folder structures]
16/196 . . . . . . [Specific adaptations of the file system to access devices and non-file objects via standard file system access operations, e.g. pseudo file systems (dedicated interfaces to storage systems G06F 3/0601)]
16/20 . . . of structured data, e.g. relational data
16/21 . . . . Design, administration or maintenance of databases
16/211 . . . . . (Schema design and management)
16/212 . . . . . [with details for data modelling support]
16/213 . . . . . [with details for schema evolution support]
16/214 . . . . . [Database migration support]
16/215 . . . . . [Improving data quality; Data cleansing, e.g. de-duplication, removing invalid entries or correcting typographical errors]
16/217 . . . . . [Database tuning (G06F 16/2282 takes precedence; database performance monitoring G06F 11/3409)]
16/219 . . . . . [Managing data history or versioning (querying versioned data G06F 16/2474; querying temporal data G06F 16/2477)]
16/22 . . . . Indexing; Data structures therefor; Storage structures
The text is a warning notice related to database management and queries. It discusses various groups and their implications, including reclassification, query processing, query formulation, and optimization. The notice advises considering certain groups and operations for complete search and reclassification.
16/24562 . . . . . . { Pointer or reference processing operations }
16/24564 . . . . . . { Applying rules; Deductive queries }
16/24567 . . . . . . { [Triggers; Constraints] }
16/24566 . . . . . . { Query processing with adaptation to specific hardware, e.g. adapted for using GPUs or SSDs }
16/24558 . . . . . . { Special types of queries, e.g. statistical queries, fuzzy queries or distributed queries }
16/24569 . . . . . . { Query processing with adaptation to specific hardware, e.g. adapted for using GPUs or SSDs }
16/2457 . . . . . . with adaptation to user needs
16/24573 . . . . . . . { using context }
16/24575 . . . . . . . { using data annotations, e.g. user-defined metadata }
16/24578 . . . . . . . { using context }
16/2458 . . . . . . . { using data annotations, e.g. user-defined metadata }
16/2462 . . . . . . . { Approximate or statistical queries }
16/2465 . . . . . . . { Query processing support for facilitating data mining operations in structured databases }
16/2466 . . . . . . . { Query processing support for facilitating data mining operations in structured databases }
16/2468 . . . . . . . { Fuzzy queries }
16/2471 . . . . . . { Distributed queries }
16/2474 . . . . . . . . { Sequence data queries, e.g. querying versioned data }
16/2477 . . . . . . . . { Temporal data queries }
16/248 . . . . . . . . . . { Presentation of query results }
16/2469 . . . . . . Integrating or interfacing systems involving database management systems

**WARNING**

Group G06F 16/25 is incomplete pending reclassification of documents from group G06F 16/25.

Groups G06F 16/23 and G06F 16/25 should be considered in order to perform a complete search.

16/252 . . . . . . [between a Database Management System and a front-end application]
16/254 . . . . . . . { Extract, transform and load (ETL) procedures, e.g. ETL data flows in data warehouses }
16/256 . . . . . . . . [in federated or virtual databases]
16/258 . . . . . . . . . . { Data format conversion from or to a database }

**WARNING**

Groups G06F 16/258 is incomplete pending reclassification of documents from group G06F 16/1794.

Groups G06F 16/1794 and G06F 16/258 should be considered in order to perform a complete search.

16/26 . . . . . . Visual data mining; Browsing structured data

16/27 . . . . . . Replication, distribution or synchronisation of data between databases or within a distributed database system; Distributed database system architectures therefor

**WARNING**

Group G06F 16/27 is impacted by reclassification into groups G06F 16/27, G06F 16/275, and G06F 16/278.

All groups listed in this Warning should be considered in order to perform a complete search.

16/273 . . . . . . { Asynchronous replication or reconciliation }

**WARNING**

Groups G06F 16/273 is incomplete pending reclassification of documents from group G06F 16/27.

Groups G06F 16/27 and G06F 16/273 should be considered in order to perform a complete search.

16/275 . . . . . . { Synchronous replication }

**WARNING**

Groups G06F 16/275 is incomplete pending reclassification of documents from group G06F 16/27.

Groups G06F 16/27 and G06F 16/275 should be considered in order to perform a complete search.

16/278 . . . . . . { Data partitioning, e.g. horizontal or vertical partitioning }

**WARNING**

Groups G06F 16/278 is incomplete pending reclassification of documents from group G06F 16/27.

Groups G06F 16/27 and G06F 16/278 should be considered in order to perform a complete search.

16/28 . . . . . . Databases characterised by their database models, e.g. relational or object models
16/282 . . . . . . . . . . { Hierarchical databases, e.g. IMS, LDAP data stores or Lotus Notes }
16/283 . . . . . . . . . . { Multi-dimensional databases or data warehouses, e.g. MOLAP or ROLAP }
16/284 . . . . . . . . . . { Relational databases }
16/285 . . . . . . . . . . . . . . { Clustering or classification }
16/287 . . . . . . . . . . . . . . . . { Visualization; Browsing }
16/288 . . . . . . . . . . . . . . . . . . . . { Entity relationship models }
16/289 . . . . . . . . . . . . . . . . . . . . . . { Object oriented databases }
16/29 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .}Note

In groups G06F 16/30, G06F 16/31, G06F 16/313, G06F 16/316, G06F 16/319, G06F 16/322, G06F 16/325, G06F 16/328, G06F 16/333, G06F 16/332, G06F 16/3325, G06F 16/3326, G06F 16/3328, G06F 16/3329, G06F 16/3331, G06F 16/3332, G06F 16/3334, G06F 16/3335, 32
16/31 . . . Indexing; Data structures therefor; Storage structures
16/313 . . . {Selection or weighting of terms for indexing}
16/316 . . . {Indexing structures}
16/319 . . . {Inverted lists}
16/322 . . . . {Trees}
16/325 . . . . {Hash tables}
16/328 . . . . {Management therefor}
16/33 . . . Querying
16/332 . . . Query formulation
16/3322 . . . . {using system suggestions (G06F 16/3325 takes precedence)}
16/3323 . . . . . {using document space presentation or visualization, e.g. category, hierarchy or range presentation and selection}
16/3325 . . . . {Reformulation based on results of preceding query}
16/3326 . . . . . {using relevance feedback from the user, e.g. relevance feedback on documents, documents sets, document terms or passages}
16/3328 . . . . . {using graphical result space presentation or visualisation}
16/3329 . . . . {Natural language query formulation or dialogue systems}
16/3331 . . . {Query processing}
16/3332 . . . {Query translation}
16/3334 . . . . {Selection or weighting of terms from queries, including natural language queries}
16/3335 . . . . {Syntactic pre-processing, e.g. stopword elimination, stemming}
16/3337 . . . . {Translation of the query language, e.g. Chinese to English}
16/3338 . . . . {Query expansion}
16/334 . . . {Query execution (G06F 16/335 takes precedence)}
16/3341 . . . . {using boolean model}
16/3343 . . . . {using phonetics}
16/3344 . . . . {using natural language analysis}
16/3346 . . . . {using probabilistic model}
16/3347 . . . . {using vector based model}
16/3349 . . . {Reuse of stored results of previous queries}
16/335 . . . Filtering based on additional data, e.g. user or group profiles (filtering in web context G06F 16/9535, G06F 16/9536)
16/337 . . . . {Profile generation, learning or modification}
16/338 . . . Presentation of query results
16/34 . . . Browsing; Visualisation therefor
16/345 . . . {Summarisation for human users}

16/35 . . . Clustering; Classification
16/353 . . . [into predefined classes]
16/355 . . . {Class or cluster creation or modification}
16/358 . . . {Browsing; Visualisation therefor}
16/36 . . . Creation of semantic tools, e.g. ontology or thesauri
16/367 . . . {Ontology}
16/374 . . . . {Thesaurus}
16/38 . . . Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually

WARNING
Group G06F 16/38 is impacted by reclassification into groups G06F 16/383 and G06F 16/387.

All groups listed in this Warning should be considered in order to perform a complete search.

16/381 . . . . {using identifiers, e.g. barcodes, RFIDs (for URLs G06F 16/9554)}
16/382 . . . . {using citations (hypermedia G06F 16/944)}
16/383 . . . . using metadata automatically derived from the content

WARNING
Group G06F 16/383 is incomplete pending reclassification of documents from group G06F 16/38.

Groups G06F 16/38 and G06F 16/383 should be considered in order to perform a complete search.

16/387 . . . using geographical or spatial information, e.g. location

WARNING
Group G06F 16/387 is incomplete pending reclassification of documents from group G06F 16/38.

Groups G06F 16/38 and G06F 16/387 should be considered in order to perform a complete search.

16/40 . . . of multimedia data, e.g. slideshows comprising image and additional audio data (retrieval of still image data G06F 16/50; retrieval of audio data G06F 16/60; retrieval of video data G06F 16/70)

NOTE
In groups G06F 16/40, G06F 16/41, G06F 16/43, G06F 16/432, G06F 16/433, G06F 16/434, G06F 16/435, G06F 16/436, G06F 16/437, G06F 16/438, G06F 16/4387, G06F 16/4393, G06F 16/44, G06F 16/444, G06F 16/447 and G06F 16/445, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/48, G06F 16/483, G06F 16/487 and G06F 16/489.
G06F

G06F 16/40 (continued)

WARNING
Group G06F 16/40 is impacted by reclassification into groups G06F 16/45, G06F 16/48, G06F 16/483, G06F 16/487, and G06F 16/489.

All groups listed in this Warning should be considered in order to perform a complete search.

16/41 . . . Indexing; Data structures therefor; Storage structures

16/43 . . . Querying

WARNING
Group G06F 16/43 is impacted by reclassification into groups G06F 16/432, G06F 16/48, G06F 16/483, G06F 16/487, and G06F 16/489.

All groups listed in this Warning should be considered in order to perform a complete search.

16/432 . . . Query formulation

WARNING
Group G06F 16/432 is incomplete pending reclassification of documents from group G06F 16/43.

Groups G06F 16/43 and G06F 16/432 should be considered in order to perform a complete search.

16/433 . . . . [using audio data]
16/434 . . . . . [using image data, e.g. images, photos, pictures taken by a user]
16/435 . . . . Filtering based on additional data, e.g. user or group profiles
16/436 . . . . . [using biological or physiological data of a human being, e.g. blood pressure, facial expression, gestures]
16/437 . . . . . [Administration of user profiles, e.g. generation, initialisation, adaptation, distribution]
16/438 . . . . Presentation of query results
16/4387 . . . . . [by the use of playlists]
16/4393 . . . . . . [Multimedia presentations, e.g. slide shows, multimedia albums]
16/44 . . . Browsing; Visualisation therefor
16/444 . . . . [Spatial browsing, e.g. 2D maps, 3D or virtual spaces]
16/447 . . . . [Temporal browsing, e.g. timeline]
16/45 . . . Clustering; Classification

WARNING
Group G06F 16/45 is incomplete pending reclassification of documents from group G06F 16/40.

Groups G06F 16/40 and G06F 16/45 should be considered in order to perform a complete search.

16/48 . . . Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually

WARNING
Group G06F 16/48 is incomplete pending reclassification of documents from groups G06F 16/40 and G06F 16/43.

Groups G06F 16/40, G06F 16/43, and G06F 16/48 should be considered in order to perform a complete search.

16/483 . . . using metadata automatically derived from the content

WARNING
Group G06F 16/483 is incomplete pending reclassification of documents from groups G06F 16/40 and G06F 16/43.

Groups G06F 16/40, G06F 16/43, and G06F 16/483 should be considered in order to perform a complete search.

16/487 . . . using geographical or spatial information, e.g. location

WARNING
Group G06F 16/487 is incomplete pending reclassification of documents from groups G06F 16/40 and G06F 16/43.

Groups G06F 16/40, G06F 16/43, and G06F 16/487 should be considered in order to perform a complete search.

16/489 . . . [using time information]

WARNING
Group G06F 16/489 is incomplete pending reclassification of documents from groups G06F 16/40 and G06F 16/43.

Groups G06F 16/40, G06F 16/43, and G06F 16/489 should be considered in order to perform a complete search.

16/50 . . . of still image data

NOTE
In groups G06F 16/50, G06F 16/51, G06F 16/53, G06F 16/532, G06F 16/535, G06F 16/538, G06F 16/54, G06F 16/55 and G06F 16/56, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/58, G06F 16/583, G06F 16/5838, G06F 16/5846, G06F 16/5854, G06F 16/5862 and G06F 16/587.

WARNING
Group G06F 16/50 is impacted by reclassification into groups G06F 16/53, G06F 16/532, G06F 16/535, G06F 16/538, and G06F 16/55.

All groups listed in this Warning should be considered in order to perform a complete search.
16/51 . . . Indexing; Data structures therefor; Storage structures

16/53 . . . Querying

**WARNING**

Group G06F 16/53 is incomplete pending reclassification of documents from group G06F 16/50.

Groups G06F 16/50 and G06F 16/53 should be considered in order to perform a complete search.

16/532 . . . Query formulation, e.g. graphical querying

**WARNING**

Group G06F 16/532 is incomplete pending reclassification of documents from group G06F 16/50.

Groups G06F 16/50 and G06F 16/532 should be considered in order to perform a complete search.

16/535 . . . Filtering based on additional data, e.g. user or group profiles

**WARNING**

Group G06F 16/535 is incomplete pending reclassification of documents from group G06F 16/50.

Groups G06F 16/50 and G06F 16/535 should be considered in order to perform a complete search.

16/538 . . . Presentation of query results

**WARNING**

Group G06F 16/538 is incomplete pending reclassification of documents from group G06F 16/50.

Groups G06F 16/50 and G06F 16/538 should be considered in order to perform a complete search.

16/54 . . . Browsing; Visualisation therefor

16/55 . . . Clustering; Classification

**WARNING**

Group G06F 16/55 is incomplete pending reclassification of documents from group G06F 16/50.

Groups G06F 16/50 and G06F 16/55 should be considered in order to perform a complete search.

16/56 . . . having vectorial format

16/58 . . . Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually

**WARNING**

Group G06F 16/58 is impacted by reclassification into group G06F 16/587.

Groups G06F 16/58 and G06F 16/587 should be considered in order to perform a complete search.

16/583 . . . using metadata automatically derived from the content

16/588 . . . [using colour]

**WARNING**

Group G06F 16/5838 is impacted by reclassification into groups G06F 16/5846, G06F 16/5854, and G06F 16/5862.

All groups listed in this Warning should be considered in order to perform a complete search.

16/5846 . . . [using extracted text]

**WARNING**

Group G06F 16/5846 is incomplete pending reclassification of documents from group G06F 16/5838.

Groups G06F 16/5838 and G06F 16/5846 should be considered in order to perform a complete search.

16/5854 . . . [using shape and object relationship]

**WARNING**

Group G06F 16/5854 is incomplete pending reclassification of documents from group G06F 16/5838.

Groups G06F 16/5838 and G06F 16/5854 should be considered in order to perform a complete search.

16/5862 . . . [using texture]

**WARNING**

Group G06F 16/5862 is incomplete pending reclassification of documents from group G06F 16/5838.

Groups G06F 16/5838 and G06F 16/5862 should be considered in order to perform a complete search.

16/5866 . . . [using information manually generated, e.g. tags, keywords, comments, manually generated location and time information]

**WARNING**

Group G06F 16/5866 is impacted by reclassification into group G06F 16/587.

Groups G06F 16/5866 and G06F 16/587 should be considered in order to perform a complete search.

16/587 . . . using geographical or spatial information, e.g. location

**WARNING**

Group G06F 16/587 is incomplete pending reclassification of documents from groups G06F 16/58 and G06F 16/5866.

Groups G06F 16/58, G06F 16/5866, and G06F 16/587 should be considered in order to perform a complete search.
NOTE
In groups G06F 16/60, G06F 16/61, G06F 16/63, G06F 16/632, G06F 16/634, G06F 16/635, G06F 16/636, G06F 16/637, G06F 16/638, G06F 16/639, G06F 16/64, and G06F 16/65, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/68, G06F 16/683, G06F 16/685, G06F 16/686 and G06F 16/687.

WARNING
Group G06F 16/60 is impacted by reclassification into groups G06F 16/63 and G06F 16/65.
Groups G06F 16/60, G06F 16/63, and G06F 16/65 should be considered in order to perform a complete search.

16/60 . . of audio data

NOTE
In groups G06F 16/60, G06F 16/61, G06F 16/63, G06F 16/632, G06F 16/634, G06F 16/635, G06F 16/636, G06F 16/637, G06F 16/638, G06F 16/639, G06F 16/64, and G06F 16/65, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/68, G06F 16/683, G06F 16/685, G06F 16/686 and G06F 16/687.

WARNING
Group G06F 16/60 is impacted by reclassification into groups G06F 16/63 and G06F 16/65.
Groups G06F 16/60, G06F 16/63, and G06F 16/65 should be considered in order to perform a complete search.

16/61 . . Indexing; Data structures therefor; Storage structures

16/63 . . Querying

WARNING
Group G06F 16/63 is incomplete pending reclassification of documents from group G06F 16/60.
Groups G06F 16/60 and G06F 16/63 should be considered in order to perform a complete search.

16/632 . . . Query formulation
16/634 . . . [Query by example, e.g. query by humming]
16/635 . . . Filtering based on additional data, e.g. user or group profiles
16/636 . . . [by using biological or physiological data]
16/637 . . . [Administration of user profiles, e.g. generation, initialization, adaptation or distribution]
16/638 . . . Presentation of query results
16/639 . . . [using playlists]
16/64 . . Browsing; Visualisation therefor (generation of a list or set of audio data G06F 16/638)
16/65 . . Clustering; Classification

WARNING
Group G06F 16/65 is incomplete pending reclassification of documents from group G06F 16/60.
Groups G06F 16/60 and G06F 16/65 should be considered in order to perform a complete search.

16/64 . . Browsing; Visualisation therefor (generation of a list or set of audio data G06F 16/638)

NOTE
In groups G06F 16/70, G06F 16/71, G06F 16/73, G06F 16/732, G06F 16/7328, G06F 16/7335, G06F 16/7343, G06F 16/735, G06F 16/738, G06F 16/739, G06F 16/74, G06F 16/743, G06F 16/745, G06F 16/747, G06F 16/75, and G06F 16/75, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/78, G06F 16/783, G06F 16/7834, G06F 16/7837, G06F 16/784, G06F 16/7844, G06F 16/7847, G06F 16/785, G06F 16/7854, G06F 16/7857, G06F 16/786, G06F 16/7864, G06F 16/7867 and G06F 16/787.

WARNING
Group G06F 16/70 is impacted by reclassification into group G06F 16/75.
Groups G06F 16/70 and G06F 16/75 should be considered in order to perform a complete search.

16/67 . . of video data

NOTE
In groups G06F 16/70, G06F 16/71, G06F 16/73, G06F 16/732, G06F 16/7328, G06F 16/7335, G06F 16/7343, G06F 16/735, G06F 16/738, G06F 16/739, G06F 16/74, G06F 16/743, G06F 16/745, G06F 16/747, G06F 16/75, and G06F 16/75, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/78, G06F 16/783, G06F 16/7834, G06F 16/7837, G06F 16/784, G06F 16/7844, G06F 16/7847, G06F 16/785, G06F 16/7854, G06F 16/7857, G06F 16/786, G06F 16/7864, G06F 16/7867 and G06F 16/787.
Querying

**WARNING**

Group G06F 16/73 is impacted by reclassification into group G06F 16/732.
Groups G06F 16/73 and G06F 16/732 should be considered in order to perform a complete search.

Query formulation

**WARNING**

Group G06F 16/732 is incomplete pending reclassification of documents from group G06F 16/73.
Groups G06F 16/73 and G06F 16/732 should be considered in order to perform a complete search.

Query by example, e.g. a complete video frame or video sequence (graphical querying G06F 16/7335)

Graphical querying, e.g. query-by-region, query-by-sketch, query-by-trajectory, GUIs for designating a person/face/ object as a query predicate (end-user interface involving hot spots associated with the video H04N 21/4725; end-user interface for selecting a Region of Interest H04N 21/4728)

Query language or query format

Filtering based on additional data, e.g. user or group profiles

Presentation of query results

[in form of a video summary, e.g. the video summary being a video sequence, a composite still image or having synthesized frames]

Browsing; Visualisation therefor (end-user interfaces for requesting or interacting with video content, e.g. video on demand interfaces or electronic program guides, H04N 21/472)

[a collection of video files or sequences]

{the internal structure of a single video sequence}

{Hypervideo (linking data to content, e.g. by linking an URL to a video object in the context of video distribution systems H04N 21/858)}

Clustering; Classification

**WARNING**

Group G06F 16/75 is incomplete pending reclassification of documents from group G06F 16/70.
Groups G06F 16/70 and G06F 16/75 should be considered in order to perform a complete search.

Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually

**WARNING**

Group G06F 16/78 is impacted by reclassification into group G06F 16/787.
Groups G06F 16/78 and G06F 16/787 should be considered in order to perform a complete search.

using metadata automatically derived from the content

{using audio features}

{using objects detected or recognised in the video content}

{the detected or recognised objects being people}

{using original textual content or text extracted from visual content or transcript of audio data}

{using low-level visual features of the video content}

{using colour or luminescence}

{using shape (G06F 16/7837 takes precedence)}

{using texture (G06F 16/7837 takes precedence)}

{using motion, e.g. object motion or camera motion}

{using domain-transform features, e.g. DCT or wavelet transform coefficients}

{using information manually generated, e.g. tags, keywords, comments, title and artist information, manually generated time, location and usage information, user ratings}

**WARNING**

Group G06F 16/7867 is impacted by reclassification into group G06F 16/787.
Groups G06F 16/7867 and G06F 16/787 should be considered in order to perform a complete search.

using geographical or spatial information, e.g. location

**WARNING**

Group G06F 16/787 is incomplete pending reclassification of documents from groups G06F 16/78 and G06F 16/7867.
Groups G06F 16/78, G06F 16/787, and G06F 16/7867 should be considered in order to perform a complete search.

of semi-structured data, e.g. markup language structured data such as SGML, XML or HTML (content-based retrieval of web data G06F 16/95)
Indexing, e.g. XML tags; Data structures therefor; Storage structures

**WARNING**
Group G06F 16/81 is incomplete pending reclassification of documents from group G06F 16/83.

Groups G06F 16/83 and G06F 16/81 should be considered in order to perform a complete search.

16/83 . . . Querying

**WARNING**
Group G06F 16/83 is impacted by reclassification into groups G06F 16/81 and G06F 16/835.

Groups G06F 16/83, G06F 16/81, and G06F 16/835 should be considered in order to perform a complete search.

Query formulation

Query processing

**WARNING**
Group G06F 16/835 is incomplete pending reclassification of documents from group G06F 16/83.

Groups G06F 16/83 and G06F 16/835 should be considered in order to perform a complete search.

Querying (for retrieval from the web G06F 16/953)

Query formulation

Query processing

**WARNING**
Group G06F 16/903 is impacted by reclassification into group G06F 16/9035.

Groups G06F 16/903 and G06F 16/9035 should be considered in order to perform a complete search.

Query translation

Query optimisation

Presentation of query results

Mapping; Conversion

Mark-up to a database

Presentation of query results

Details of database functions independent of the retrieved data types

**NOTE**
In groups G06F 16/90, G06F 16/901, G06F 16/9014, G06F 16/9017, G06F 16/902, G06F 16/9024, G06F 16/9027, G06F 16/903, G06F 16/9032, G06F 16/90324, G06F 16/90328, G06F 16/90332, G06F 16/90335, G06F 16/90339, G06F 16/90344, G06F 16/90348, G06F 16/9035, G06F 16/90358, G06F 16/9038, G06F 16/904, and G06F 16/906, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/907, G06F 16/907, and G06F 16/909.

**WARNING**
Group G06F 16/90 is impacted by reclassification into group G06F 16/906.

Groups G06F 16/90 and G06F 16/906 should be considered in order to perform a complete search.

Mapping to a database

Mark-up to mark-up conversion (conversion for visualization in web browsing G06F 16/9577)

Clustering; Classification

**WARNING**
Group G06F 16/906 is incomplete pending reclassification of documents from group G06F 16/90.

Groups G06F 16/90 and G06F 16/906 should be considered in order to perform a complete search.
Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually

**WARNING**

Group G06F 16/907 is impacted by reclassification into groups G06F 16/908 and G06F 16/909.

Groups G06F 16/907, G06F 16/908, and G06F 16/909 should be considered in order to perform a complete search.

using metadata automatically derived from the content

**WARNING**

Group G06F 16/908 is incomplete pending reclassification of documents from group G06F 16/907.

Groups G06F 16/907 and G06F 16/908 should be considered in order to perform a complete search.

using geographical or spatial information, e.g. location (spatiotemporally dependent retrieval from the web G06F 16/9537)

**WARNING**

Group G06F 16/909 is incomplete pending reclassification of documents from group G06F 16/907.

Groups G06F 16/907 and G06F 16/908 should be considered in order to perform a complete search.

Document management systems

Hyperlinking G06F 40/134

Retrieval from the web

Indexing; Web crawling techniques

**WARNING**

Group G06F 16/951 is impacted by reclassification into groups G06F 16/953, G06F 16/9532 and G06F 16/9538.

All groups listed in this Warning should be considered in order to perform a complete search.

Querying, e.g. by the use of web search engines

**WARNING**

Group G06F 16/953 is incomplete pending reclassification of documents from group G06F 16/951.

Groups G06F 16/951 and G06F 16/953 should be considered in order to perform a complete search.

Query formulation

**WARNING**

Group G06F 16/9532 is incomplete pending reclassification of documents from group G06F 16/951.

Groups G06F 16/951 and G06F 16/9532 should be considered in order to perform a complete search.

Search customisation based on user profiles and personalisation

**WARNING**

Group G06F 16/9535 is incomplete pending reclassification of documents from group G06F 16/9536 and G06F 16/9538.

Groups G06F 16/9535, G06F 16/9536, and G06F 16/9538 should be considered in order to perform a complete search.

Search customisation based on social or collaborative filtering

**WARNING**

Group G06F 16/9536 is incomplete pending reclassification of documents from group G06F 16/9535.

Groups G06F 16/9535 and G06F 16/9536 should be considered in order to perform a complete search.

Spatial or temporal dependent retrieval, e.g. spatiotemporal queries

Presentation of query results

**WARNING**

Group G06F 16/9538 is incomplete pending reclassification of documents from groups G06F 16/951 and G06F 16/9535.

Groups G06F 16/951, G06F 16/9535, and G06F 16/9538 should be considered in order to perform a complete search.

Navigation, e.g. using categorised browsing

using information identifiers, e.g. uniform resource locators [URL]
{ by using bar codes }
{ Details of hyperlinks; Management of linked annotations }
{ Bookmark management }
{ URL specific, e.g. using aliases, detecting broken or misspelled links }

Browsing optimisation, e.g. caching or content distillation

{ of access to content, e.g. by caching }
{ Optimising the visualization of content, e.g. distillation of HTML documents }

Organisation or management of web site content, e.g. publishing, maintaining pages or automatic linking

{ Access to data in other repository systems, e.g. legacy data or dynamic Web page generation }
16/986 . . . . {Document structures and storage, e.g. HTML extensions}

17/00 Digital computing or data processing equipment or methods, specially adapted for specific functions (information retrieval, database structures or file system structures therefor G06F 16/00)

17/10 . Complex mathematical operations { (function generation by table look-up G06F 1/03: evaluation of elementary functions by calculation G06F 7/544)

17/11 . . . for solving equations, e.g. nonlinear equations, general mathematical optimization problems (optimization specially adapted for a specific administrative, business or logistic context G06Q 10/04)

17/12 . . . Simultaneous equations, e.g. systems of linear equations

17/13 . . . Fourier, Walsh or analogous domain transformations, e.g. Laplace, Hilbert, Karhunen-Loeve, transforms (for correlation function computation G06F 17/156: spectrum analysers G01R 23/16)

17/14 . . . . [Discrete Fourier transforms]

17/15 . . . Correlation function computation {including computation of convolution operations (arithmetic circuits for sum of products per e.g. e.g. multiply-accumulators G06F 7/5443; digital filters, e.g. FIR, IIR, adaptive filters H03H 17/00)}

17/16 . . . . {Matrix or vector computation, e.g. matrix-matrix or matrix-vector multiplication, matrix factorization (matrix transposition G06F 7/781)

17/17 . . . Function evaluation by approximation methods, e.g. interpolation for numerical control G05B 19/18)

17/18 . . . . {of multidimensional data}

17/40 . Data acquisition and logging (for input to computer G06F 3/00; displays as computer output G06F 3/14; for image data processing G06T 9/00; compression in general H03M 7/30; for transmission H04B 1/66; for pictorial communication H04N; arrangements in telecontrol or telemetry systems for selectively calling a substation from a main station H04Q 9/00)

WARNING
This group is no longer used for the classification of new documents. The documents are classified in the application fields according to the references above

19/00 Digital computing or data processing equipment or methods, specially adapted for specific applications (specially adapted for specific functions G06F 17/00; data processing systems or methods specially adapted for administrative, commercial, financial, managerial, supervisory or forecasting purposes G06Q; healthcare informatics G16H)

WARNING
Group G06F 19/00 is no longer used for the classification of documents as of 02-01-2019. The content of this group is being reclassified into group G16Z 99/00.

Groups G06F 19/00 and G16Z 99/00 should be considered in order to perform a complete search.

19/30 (Frozen) . {Medical informatics, i.e. computer-based analysis or dissemination of patient or disease data (measuring for diagnostic purposes A61B 5/00; recognising patterns in biomedical signals G06K 9/0046; data processing systems or methods specially adapted for administrative or managerial aspects of healthcare or welfare G06Q 50/22)}

WARNING
Group G06F 19/30 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 10/00 – G16H 80/00.

Groups G06F 19/30 and G16H 10/00 – G16H 80/00 should be considered in order to perform a complete search.

19/32 (Frozen) . {Medical data management, e.g. systems or protocols for archival or communication of medical images, computerised patient records or computerised general medical references (information retrieval or databases per se G06F 16/00; data security aspects G06F 21/00)}

WARNING
Group G06F 19/32 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 10/00 – G16H 80/00.

Groups G06F 19/32 and G16H 10/00 – G16H 80/00 should be considered in order to perform a complete search.
(Frozen) . . . [Management of medical image data, e.g. communication or archiving systems such as picture archiving and communication systems [PACS] or related medical protocols such as digital imaging and communications in medicine protocol [DICOM]; Editing of medical image data, e.g. adding diagnosis information (image data processing in general G06T, image data processing related to 3D objects G06F 17/00; biomedical image inspection G06T 7/0012)]

**WARNING**

Group G06F 19/321 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 30/00 – G16H 30/40.

Groups G06F 19/321 and G16H 30/00 – G16H 30/40 should be considered in order to perform a complete search.

(Frozen) . . . [Management of patient independent data, e.g. medical references in digital format]

**WARNING**

Group G06F 19/324 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 70/00 and G16H 70/60.

Groups G06F 19/324, G16H 70/00, and G16H 70/60 should be considered in order to perform a complete search.

(Frozen) . . . [Medical practices, e.g. general treatment protocols]

**WARNING**

Group G06F 19/325 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 70/20 and G16H 70/60.

Groups G06F 19/325, G16H 70/20, and G16H 70/60 should be considered in order to perform a complete search.

(Frozen) . . . [Medication information, e.g. drug reference databases]

**WARNING**

Group G06F 19/326 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 70/40 and G16H 70/60.

Groups G06F 19/326, G16H 70/40, and G16H 70/60 should be considered in order to perform a complete search.

(Frozen) . . . [Health insurance management, e.g. payments or protection against fraud]

**WARNING**

Group G06F 19/328 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G06Q 10/10 and G06Q 40/08.

Groups G06F 19/328, G06Q 10/10 and G06Q 40/08 should be considered in order to perform a complete search.

(Frozen) . . . [Computer-assisted medical diagnosis or treatment, e.g. computerised prescription or delivery of medication or diets, computerised local control of medical devices, medical expert systems or telemedicine]

**WARNING**

Group G06F 19/34 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 10/00 – G16H 80/00. Groups G06F 19/34 and G16H 10/00 – G16H 80/00 should be considered in order to perform a complete search.

Groups G06F 19/34 and G16H 10/00 – G16H 80/00 should be considered in order to perform a complete search.

(Frozen) . . . [Telemedicine, e.g. remote diagnosis, remote control of instruments or remote monitoring of patient carried devices]

**WARNING**

Group G06F 19/3418 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 40/40, G16H 40/60, G16H 40/67, G16H 40/67.

Groups G06F 19/3418, G16H 40/40, G16H 40/60, and G16H 40/67 should be considered in order to perform a complete search.

(Frozen) . . . [Computer-assisted prescription or delivery of medication, e.g. prescription filling or compliance checking]

**WARNING**

Group G06F 19/3456 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 20/10, G16H 20/60, G16H 20/70, and G16H 20/90.

All groups listed in this Warning should be considered in order to perform a complete search.
19/3462 . . . (Frozen) Computer-assisted distribution of medication from dispensers, i.e. making sure that medication is correctly delivered to patients (medication containers A61J 1/00; dispensers activated by money or the like G07F)

**WARNING**

Group G06F 19/3462 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 20/13, G16H 20/60, G16H 20/70, and G16H 20/90.

All groups listed in this Warning should be considered in order to perform a complete search.

19/3468 . . . (Frozen) Computer-assisted delivery of medication via infusion or injection (infusion devices per se A61M 5/14)

**WARNING**

Group G06F 19/3468 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 20/17, G16H 20/60, G16H 20/70, and G16H 20/90.

All groups listed in this Warning should be considered in order to perform a complete search.

19/3475 . . . (Frozen) Computer-assisted prescription or delivery of diets, e.g. prescription filling or compliance checking

**WARNING**

Group G06F 19/3475 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 20/60, G16H 20/70 and G16H 20/90.

Groups G06F 19/3475, G16H 20/60, G16H 20/70 and G16H 20/90 should be considered in order to perform a complete search.

19/3481 . . . (Frozen) Computer-assisted prescription or delivery of treatment by physical action, e.g. surgery or physical exercise (surgical instruments, devices or methods A61B 17/00; apparatuses for physical training A63B)

**WARNING**

Group G06F 19/3481 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 20/50, G16H 20/70 and G16H 20/90.

Groups G06F 19/3481, G16H 20/50, G16H 20/70 and G16H 20/90 should be considered in order to perform a complete search.

19/36 . . . (Frozen) Computer-assisted acquisition of medical data, e.g. computerised clinical trials or questionnaires (measuring analogue medical signals A61B 5/00)

**WARNING**

Group G06F 19/36 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 10/00 – G16H 10/40.

Groups G06F 19/36 and G16H 10/00 – G16H 10/40 should be considered in order to perform a complete search.

21/00 Security arrangements for protecting computers, components thereof, programs or data against unauthorised activity

21/10 . Protecting distributed programs or content, e.g. vending or licensing of copyrighted material

21/105 . . . [Tools for software license management or administration, e.g. managing licenses at corporate level]

21/12 . Protecting executable software

21/121 . . . [Restricting unauthorised execution of programs]

21/123 . . . . [by using dedicated hardware, e.g. dongles, smart cards, cryptographic processors, global positioning systems [GPS] devices]

21/125 . . . . [by manipulating the program code, e.g. source code, compiled code, interpreted code, machine code]

21/126 . . . . [Interacting with the operating system]

21/128 . . . . [Involving web programs, i.e. using technology especially used in internet, generally interacting with a web browser, e.g. hypertext markup language [HTML], applets, java]

21/14 . . . against software analysis or reverse engineering, e.g. by obfuscation

21/16 . Program or content traceability, e.g. by watermarking

21/30 . Authentication, i.e. establishing the identity or authorisation of security principals

21/305 . . . [by remotely controlling device operation]

21/31 . . User authentication

21/313 . . . . [using a call-back technique via a telephone network]

21/316 . . . . [by observing the pattern of computer usage, e.g. typical user behaviour]

21/32 . . Using biometric data, e.g. fingerprints, iris scans or voiceprints

21/33 . . . using certificates

21/335 . . . . [for accessing specific resources, e.g. using Kerberos tickets]

21/34 . . . involving the use of external additional devices, e.g. dongles or smart cards

21/35 . . . . communicating wirelessly

21/36 . . by graphic or iconic representation

21/40 . . . by quorum, i.e. whereby two or more security principals are required

21/41 . . . where a single sign-on provides access to a plurality of computers

21/42 . . . using separate channels for security data

21/43 . . . wireless channels
21/44 . . . Program or device authentication
21/445 . . . [by mutual authentication, e.g. between devices or programs]
21/45 . . . Structures or tools for the administration of authentication
21/46 . . . [by designing passwords or checking the strength of passwords]
21/50 . . . Monitoring users, programs or devices to maintain the integrity of platforms, e.g. of processors, firmware or operating systems
21/51 . . . [at application loading time, e.g. accepting, rejecting, starting or inhibiting executable software based on integrity or source reliability]
21/52 . . . [during program execution, e.g. stack integrity]
21/53 . . . by executing in a restricted environment, e.g. sandbox or secure virtual machine
21/54 . . . by adding security routines or objects to programs
21/55 . . . Detecting local intrusion or implementing counter-measures
21/552 . . . [involving long-term monitoring or reporting]
21/554 . . . [involving event detection and direct action]
21/556 . . . [involving covert channels, i.e. data leakage between processes (inhibiting the analysis of circuitry or operation with measures against power attack G06F 21/755)]
21/56 . . . Computer malware detection or handling, e.g. anti-virus arrangements
21/561 . . . [Virus type analysis]
21/562 . . . [Static detection]
21/563 . . . [by source code analysis]
21/564 . . . [by virus signature recognition]
21/565 . . . [by checking file integrity]
21/566 . . . [Dynamic detection, i.e. detection performed at run-time, e.g. emulation, suspicious activities]
21/567 . . . [using dedicated hardware]
21/568 . . . [eliminating virus, restoring damaged files]
21/57 . . . Certifying or maintaining trusted computer platforms, e.g. secure boots or power-downs, version controls, system software checks, secure updates or assessing vulnerabilities

WARNING
Group G06F 21/57 - G06F 21/577 is incomplete pending reclassification of documents from groups G06F 8/65, G06F 8/71, and G06F 9/445.

All groups listed in this Warning should be considered in order to perform a complete search.

21/572 . . . [Secure firmware programming, e.g. of basic input output system [BIOS]]
21/575 . . . [Secure boot]
21/577 . . . [Assessing vulnerabilities and evaluating computer system security]
21/60 . . . Protecting data
21/602 . . . [Providing cryptographic facilities or services]
21/604 . . . [Tools and structures for managing or administering access control systems]

WARNING
Group G06F 21/75 is impacted by reclassification into group G06F 21/755.

Groups G06F 21/75 and G06F 21/755 should be considered in order to perform a complete search.

21/575 . . . [with measures against power attack]

WARNING
Group G06F 21/755 is incomplete pending reclassification of documents from group G06F 21/75.

Groups G06F 21/75 and G06F 21/755 should be considered in order to perform a complete search.

21/76 . . . in application-specific integrated circuits [ASICs] or field-programmable devices, e.g. field-programmable gate arrays [FPGAs] or programmable logic devices [PLDs]
21/77 . . . in smart cards
21/78 . . . to assure secure storage of data (address-based protection against unauthorised use of memory G06F 12/14; record carriers for use with machines and with at least a part designed to carry digital markings G06K 19/00)

21/79 . . . in semiconductor storage media, e.g. directly-addressable memories

21/80 . . . in storage media based on magnetic or optical technology, e.g. disks with sectors (preventing unauthorised reproduction or copying of disc-type recordable media G11B 20/00)

21/805 . . . {using a security table for the storage subsystem}

21/81 . . . by operating on the power supply, e.g. enabling or disabling power-on, sleep or resume operations

21/82 . . . Protecting input, output or interconnection devices

21/83 . . . input devices, e.g. keyboards, mice or controllers thereof

21/84 . . . output devices, e.g. displays or monitors

21/85 . . . interconnection devices, e.g. bus-connected or in-line devices

21/86 . . . Secure or tamper-resistant housings

21/87 . . . by means of encapsulation, e.g. for integrated circuits

21/88 . . . Detecting or preventing theft or loss

30/00 Computer-aided design [CAD]

NOTE
In this group, it is desirable to add the indexing codes of groups G06F 2111/00 - G06F 2119/00.

WARNING
Group G06F 30/00 is impacted by reclassification into groups G06F 30/10, G06F 30/12, G06F 2111/00, and G06F 2119/22 should be considered in order to perform a complete search.

30/10 . . . Geometric CAD

WARNING
Group G06F 30/10 is incomplete pending reclassification of documents from group G06F 30/00.

Groups G06F 30/00 and G06F 30/10 should be considered in order to perform a complete search.

30/12 . . . characterised by design entry means specially adapted for CAD, e.g. graphical user interfaces [GUI] specially adapted for CAD

WARNING
Group G06F 30/12 is incomplete pending reclassification of documents from groups G06F 30/00, G06F 30/17, and G06F 30/18. All groups listed in this Warning should be considered in order to perform a complete search.

30/13 . . . Architectural design, e.g. computer-aided architectural design [CAAD] related to design of buildings, bridges, landscapes, production plants or roads

30/15 . . . Vehicle, aircraft or watercraft design

30/17 . . . Mechanical parametric or variational design

WARNING
Group G06F 30/17 is impacted by reclassification into groups G06F 30/12 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/17, G06F 30/12 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

30/18 . . . Network design, e.g. design based on topological or interconnect aspects of utility systems, piping, heating ventilation air conditioning [HVAC] or cabling (circuit design at the physical level G06F 30/39; network planning tools for wireless communication networks H04W 16/18)

WARNING
Group G06F 30/18 is impacted by reclassification into groups G06F 30/12 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/18, G06F 30/12 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

30/20 . . . Design optimisation, verification or simulation (optimisation, verification or simulation of circuit designs G06F 30/30)

WARNING
Group G06F 30/20 is impacted by reclassification into groups G06F 30/25, G06F 30/27, G06F 30/28 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/20, G06F 30/25, G06F 30/27, G06F 30/28 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

30/22 . . . using Petri net models

30/23 . . . using finite element methods [FEM] or finite difference methods [FDM]

WARNING
Group G06F 30/23 is impacted by reclassification into groups G06F 30/25, G06F 30/367, G06F 30/398 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/23, G06F 30/25, G06F 30/367, G06F 30/398 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.
using particle-based methods

**WARNING**

Group G06F 30/25 is incomplete pending reclassification of documents from groups G06F 30/20 and G06F 30/23.

Groups G06F 30/20, G06F 30/23, and G06F 30/25 should be considered in order to perform a complete search.

using machine learning, e.g. artificial intelligence, neural networks, support vector machines [SVM] or training a model

**WARNING**

Group G06F 30/27 is incomplete pending reclassification of documents from group G06F 30/20.

Groups G06F 30/20 and G06F 30/27 should be considered in order to perform a complete search.

using fluid dynamics, e.g. using Navier-Stokes equations or computational fluid dynamics [CFD]

**WARNING**

Group G06F 30/28 is incomplete pending reclassification of documents from group G06F 30/20.

Groups G06F 30/20 and G06F 30/28 should be considered.

Circuit design

**WARNING**

Group G06F 30/30 is impacted by reclassification into groups G06F 30/31, G06F 30/32, G06F 30/323, G06F 30/33, G06F 30/333, G06F 30/337, G06F 30/34, G06F 30/343, G06F 30/347, G06F 30/38 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/30, G06F 30/31, G06F 30/32, G06F 30/323, G06F 30/33, G06F 30/333, G06F 30/337, G06F 30/34, G06F 30/343, G06F 30/347, G06F 30/38 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

Design entry, e.g. editors specifically adapted for circuit design

**WARNING**

Group G06F 30/31 is incomplete pending reclassification of documents from groups G06F 30/30, G06F 30/34, and G06F 30/36. All groups listed in this Warning should be considered in order to perform a complete search.

Design verification, e.g. functional simulation or model checking

**WARNING**

Group G06F 30/33 is impacted by reclassification into groups G06F 30/3308, G06F 30/3315 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/33, G06F 30/3308, G06F 30/3315 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

using simulation

**WARNING**

Group G06F 30/3308 is incomplete pending reclassification of documents from group G06F 30/33.

Groups G06F 30/33 and G06F 30/3308 should be considered in order to perform a complete search.

with hardware acceleration, e.g. by using field programmable gate array [FPGA] or emulation
Timing analysis

**WARNING**

Group G06F 30/3312 is impacted by reclassification into groups G06F 30/3315 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/3312, G06F 30/3315 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

Group G06F 30/3315 is incomplete pending reclassification of documents from groups G06F 30/33 and G06F 30/3312.

Groups G06F 30/33, G06F 30/3312 and G06F 30/3315 should be considered in order to perform a complete search.

Design for testability (DFT), e.g. scan chain or built-in self-test (BIST)

**WARNING**

Group G06F 30/333 is incomplete pending reclassification of documents from group G06F 30/30.

Groups G06F 30/30 and G06F 30/333 should be considered in order to perform a complete search.

Delay-insensitive circuit design, e.g. asynchronous or self-timed

**WARNING**

Group G06F 30/36 is impacted by reclassification into groups G06F 30/31, G06F 30/373, G06F 30/38 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/31, G06F 30/373, G06F 30/38 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

Design verification, e.g. using simulation, simulation program with integrated circuit emphasis (SPICE), direct methods or relaxation methods

**WARNING**

Group G06F 30/367 is incomplete pending reclassification of documents from group G06F 30/23.

Groups G06F 30/23 and G06F 30/367 should be considered in order to perform a complete search.

Design optimisation

**WARNING**

Group G06F 30/337 is incomplete pending reclassification of documents from group G06F 30/36.

Groups G06F 30/36 and G06F 30/337 should be considered in order to perform a complete search.

Design optimisation

**WARNING**

Group G06F 30/373 is incomplete pending reclassification of documents from group G06F 30/36.

Groups G06F 30/36 and G06F 30/373 should be considered in order to perform a complete search.

Circuit design at the analogue level
Circuit design at the mixed level of analogue and digital signals

**WARNING**

Group G06F 30/38 is incomplete pending reclassification of documents from groups G06F 30/30 and G06F 30/36.

Groups G06F 30/30, G06F 30/36, and G06F 30/38 should be considered in order to perform a complete search.

Circuit design at the physical level (physical level design for reconfigurable circuits G06F 30/347)

**WARNING**

Group G06F 30/39 is impacted by reclassification into groups G06F 30/347, G06F 30/396, G06F 30/398 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/39, G06F 30/347, G06F 30/396, G06F 30/398 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

Floor-planning or layout, e.g. partitioning or placement

**WARNING**

Group G06F 30/392 is impacted by reclassification into groups G06F 30/396 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/392, G06F 30/396 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

Routing (G06F 30/396 takes precedence)

**WARNING**

Group G06F 30/394 is impacted by reclassification into groups G06F 30/394, G06F 30/395, G06F 30/396 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/394, G06F 30/395, G06F 30/396 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

Circuit design at the physical level (physical level design for reconfigurable circuits G06F 30/347)

**WARNING**

Group G06F 30/394 is incomplete pending reclassification of documents from group G06F 30/39.

Groups G06F 30/394 and G06F 30/3947 should be considered in order to perform a complete search.

**WARNING**

Group G06F 30/3947 is incomplete pending reclassification of documents from group G06F 30/39.

Groups G06F 30/394 and G06F 30/3947 should be considered in order to perform a complete search.

**WARNING**

Group G06F 30/393 is incomplete pending reclassification of documents from group G06F 30/394.

Groups G06F 30/394 and G06F 30/3953 should be considered in order to perform a complete search.

Groups G06F 30/394, G06F 30/3953, G06F 30/396 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

**WARNING**

Group G06F 30/396 is incomplete pending reclassification of documents from groups G06F 30/39, G06F 30/392, and G06F 30/394.

Groups G06F 30/396 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

**WARNING**

Group G06F 30/396 is incomplete pending reclassification of documents from groups G06F 30/23 and G06F 30/39.

Groups G06F 30/23, G06F 30/39 and G06F 30/398 should be considered in order to perform a complete search.

**WARNING**

Group G06F 30/398 is incomplete pending reclassification of documents from groups G06F 30/23 and G06F 30/39.

Groups G06F 30/23, G06F 30/39 and G06F 30/398 should be considered in order to perform a complete search.

**WARNING**

Group G06F 30/398 is also impacted by reclassification into group G06F 2117/04.

All groups listed in this Warning should be considered in order to perform a complete search.

**WARNING**

Group G06F 30/398 is incomplete pending reclassification of documents from groups G06F 30/23 and G06F 30/39.

Groups G06F 30/23, G06F 30/39 and G06F 30/398 should be considered in order to perform a complete search.

Handling natural language data (speech analysis or synthesis, speech recognition G10L)

Text processing (natural language analysis G06F 40/20; semantic analysis G06F 40/30; processing or translation of natural language G06F 40/40)

Formatting, i.e. changing of presentation of documents (automatic justification G06F 40/189; automatic line break hyphenation G06F 40/191)

Display of layout of documents; Previewing

Font handling; Temporal or kinetic typography

Mathematical or scientific formatting; Subscripts; Superscripts

Pagination

Tagging; Marking up (details of markup languages G06F 40/143; Designating a block; Setting of attributes (style sheets, e.g. eXtensible Stylesheet Language Transformation [XSLT], G06F 40/154)

Use of codes for handling textual entities

Storage facilities

Character encoding

Handling non-Latin characters, e.g. kana-to-kanji conversion

Fragmentation of text files, e.g. creating reusable text-blocks; Linking to fragments, e.g. using XInclude; Namespaces

Hyperlinking

Hierarchical processing, e.g. outlines
40/14 . . . Tree-structured documents (parsing G06F 40/205; validation G06F 40/226)

**WARNING**

Group G06F 40/14 is impacted by reclassification into group G06F 40/237.

Groups G06F 40/14 and G06F 40/143 should be considered in order to perform a complete search.

40/143 . . . Markup, e.g. Standard Generalized Markup Language [SGML] or Document Type Definition [DTD]

**WARNING**

Group G06F 40/143 is incomplete pending reclassification of documents from group G06F 40/14.

Groups G06F 40/14 and G06F 40/143 should be considered in order to perform a complete search.

40/146 . . . Coding or compression of tree-structured data

40/149 . . . Adaptation of the text data for streaming purposes, e.g. Efficient XML Interchange [EXI] format

40/151 . . . Transformation

40/154 . . . Tree transformation for tree-structured or markup documents, e.g. XSLT, XSL-FO or stylesheets

40/157 . . . using dictionaries or tables

40/16 . . . Automatic learning of transformation rules, e.g. from examples

40/163 . . . Handling of whitespace

40/166 . . . Editing, e.g. inserting or deleting

40/169 . . . Annotation, e.g. comment data or footnotes

40/171 . . . by use of digital ink

40/174 . . . Form filling; Merging

40/177 . . . of tables; using ruled lines

40/18 . . . of spreadsheets (form-filling G06F 40/174)

40/183 . . . Tabulation, i.e. one-dimensional positioning

40/186 . . . Templates

40/189 . . . Automatic justification

40/191 . . . Automatic line break hyphenation

40/194 . . . Calculation of difference between files

40/197 . . . Version control (for software G06F 8/71)

40/20 . . . Natural language analysis (semantic analysis of natural language G06F 40/30)

**WARNING**

Group G06F 40/20 is impacted by reclassification into group G06F 40/237.

Groups G06F 40/20 and G06F 40/237 should be considered in order to perform a complete search.

40/205 . . . Parsing

40/211 . . . Syntactic parsing, e.g. based on context-free grammar [CFG] or unification grammars

40/216 . . . using statistical methods

40/221 . . . Parsing markup language streams (streaming G06F 40/149)

40/226 . . . Validation

40/232 . . . Orthographic correction, e.g. spell checking or vowelisation

40/237 . . . Lexical tools

**WARNING**

Group G06F 40/237 is incomplete pending reclassification of documents from group G06F 40/20.

Groups G06F 40/20 and G06F 40/237 should be considered in order to perform a complete search.

40/242 . . . Dictionaries

40/247 . . . Thesauruses; Synonyms

40/253 . . . Grammatical analysis; Style critique

40/258 . . . Heading extraction; Automatic titling; Numbering

40/263 . . . Language identification

40/268 . . . Morphological analysis

40/274 . . . Converting codes to words; Guess-ahead of partial word inputs

40/279 . . . Recognition of textual entities

40/284 . . . Lexical analysis, e.g. tokenisation or collocates

40/289 . . . Phrasal analysis, e.g. finite state techniques or chunking

40/295 . . . Named entity recognition

40/30 . . . Semantic analysis

40/35 . . . Discourse or dialogue representation

40/40 . . . Processing or translation of natural language (natural language analysis G06F 40/20; semantic analysis G06F 40/30)

40/42 . . . Data-driven translation

40/44 . . . Statistical methods, e.g. probability models

40/45 . . . Example-based machine translation; Alignment

40/47 . . . Machine-assisted translation, e.g. using translation memory

40/49 . . . using very large corpora, e.g. the web

40/51 . . . Translation evaluation

40/53 . . . Processing of non-Latin text (kana-to-kanji conversion G06F 40/129; vowelisation G06F 40/232)

40/55 . . . Rule-based translation

40/56 . . . Natural language generation

40/58 . . . Use of machine translation, e.g. for multi-lingual retrieval, for server-side translation for client devices or for real-time translation

**2101/00** Indexing scheme relating to the type of digital function generated

2101/02 . . . Linear multivariable functions, i.e. sum of products

2101/04 . . . Trigonometric functions

2101/06 . . . Co-ordinate transformations

2101/08 . . . Powers or roots

2101/10 . . . Logarithmic or exponential functions

2101/12 . . . Reciprocal functions

2101/14 . . . Probability distribution functions

2101/16 . . . PCM compounding functions
Indexing scheme associated with group G06F 30/00, relating to CAD techniques

2111/00 Details relating to CAD techniques

**WARNING**

Groups G06F 2111/00 - G06F 2111/20 are incomplete pending reclassification of documents from groups G06F 30/00, G06F 30/17, G06F 30/18, G06F 30/20, G06F 30/23, G06F 30/30, G06F 30/327, G06F 30/33, G06F 30/3312, G06F 30/34, G06F 30/36, G06F 30/39, G06F 30/392, and G06F 30/394.

All groups listed in this Warning should be considered in order to perform a complete search.

2111/02 . CAD in a network environment, e.g. collaborative CAD or distributed simulation
2111/04 . Constraint-based CAD
2111/06 . Multi-objective optimisation, e.g. Pareto optimisation using simulated annealing [SA], ant colony algorithms or genetic algorithms [GA]
2111/08 . Probabilistic or stochastic CAD
2111/10 . Numerical modelling
2111/12 . Symbolic schematics
2111/14 . related to nanotechnology
2111/16 . Customisation or personalisation
2111/18 . using virtual or augmented reality
2111/20 . Configuration CAD, e.g. designing by assembling or positioning modules selected from libraries of predesigned modules

Indexing scheme associated with group G06F 30/00, relating to the type of the circuit

2115/00 Details relating to the type of the circuit

**WARNING**

Groups G06F 2115/00 - G06F 2115/12 are incomplete pending reclassification of documents from groups G06F 30/00, G06F 30/17, G06F 30/18, G06F 30/20, G06F 30/23, G06F 30/30, G06F 30/327, G06F 30/33, G06F 30/3312, G06F 30/34, G06F 30/36, G06F 30/39, G06F 30/392, and G06F 30/394.

All groups listed in this Warning should be considered in order to perform a complete search.

2115/02 . System on chip [SoC] design
2115/04 . Micro electro-mechanical systems [MEMS]
2115/06 . Structured ASICs
2115/08 . Intellectual property [IP] blocks or IP cores
2115/10 . Processors
2115/12 . Printed circuit boards [PCB] or multi-chip modules [MCM]

Indexing scheme associated with group G06F 30/00, relating to the type or aim of the circuit design

2117/00 Details relating to the type or aim of the circuit design

**WARNING**

Groups G06F 2117/00 - G06F 2117/12 are incomplete pending reclassification of documents from groups G06F 30/00, G06F 30/17, G06F 30/18, G06F 30/20, G06F 30/23, G06F 30/30, G06F 30/327, G06F 30/33, G06F 30/3312, G06F 30/34, G06F 30/36, G06F 30/39, G06F 30/392, and G06F 30/394.

All groups listed in this Warning should be considered in order to perform a complete search.

2117/02 . Fault tolerance, e.g. for transient fault suppression
2117/04 . Clock gating

2117/06 . Spare resources, e.g. for permanent fault suppression
2117/08 . HW-SW co-design, e.g. HW-SW partitioning
2117/10 . Buffer insertion
2117/12 . Sizing, e.g. of transistors or gates

Indexing scheme associated with group G06F 30/00, relating to the application field

2113/00 Details relating to the application field

**WARNING**

Groups G06F 2113/00 - G06F 2113/28 are incomplete pending reclassification of documents from groups G06F 30/00, G06F 30/17, G06F 30/18, G06F 30/20, G06F 30/23, G06F 30/30, G06F 30/327, G06F 30/33, G06F 30/3312, G06F 30/34, G06F 30/36, G06F 30/39, G06F 30/392, and G06F 30/394.

All groups listed in this Warning should be considered in order to perform a complete search.

2113/02 . Data centres
2113/04 . Power grid distribution networks
2113/06 . Wind turbines or wind farms
2113/08 . Fluids
2113/10 . Additive manufacturing, e.g. 3D printing
2113/12 . Cloth
2113/14 . Pipes
2113/16 . Cables, cable trees or wire harnesses
2113/18 . Chip packaging
2113/20 . Packaging, e.g. boxes or containers
2113/22 . Moulding
2113/24 . Sheet material
2113/26 . Composites
2113/28 . Fuselage, exterior or interior
Indexing scheme associated with group G06F 30/00, relating to the purpose – mostly applicable to circuits – but also relevant for general CAD

2119/00 Details relating to the type or aim of the analysis or the optimisation

**WARNING**

Groups G06F 2119/00 - G06F 2119/22 are incomplete pending reclassification of documents from groups G06F 30/00, G06F 30/17, G06F 30/18, G06F 30/20, G06F 30/23, G06F 30/30, G06F 30/327, G06F 30/33, G06F 30/331,2, G06F 30/34, G06F 30/36, G06F 30/39, G06F 30/392, and G06F 30/394.

All groups listed in this Warning should be considered in order to perform a complete search.

2119/02 . . . Reliability analysis or reliability optimisation; Failure analysis, e.g. worst case scenario performance, failure mode and effects analysis [FMEA]

2119/04 . . . Ageing analysis or optimisation against ageing

2119/06 . . . Power analysis or power optimisation

2119/08 . . . Thermal analysis or thermal optimisation

2119/10 . . . Noise analysis or noise optimisation

2119/12 . . . Timing analysis or timing optimisation

2119/14 . . . Force analysis or force optimisation, e.g. static or dynamic forces

2119/16 . . . Equivalence checking

2119/18 . . . Manufacturability analysis or optimisation for manufacturability

2119/20 . . . Design reuse, reusability analysis or reusability optimisation

2119/22 . . . Yield analysis or yield optimisation

2200/00 Indexing scheme relating to G06F 1/04 - G06F 1/32

2200/16 . . . Indexing scheme relating to G06F 1/16 - G06F 1/18

2200/161 . . . Indexing scheme relating to constructional details of the monitor

2200/1611 . . . CRT monitor

2200/1612 . . . Flat panel monitor

2200/1613 . . . Supporting arrangements, e.g. for filters or documents associated to a laptop display

2200/1614 . . . Image rotation following screen orientation, e.g. switching from landscape to portrait mode

2200/163 . . . Indexing scheme relating to constructional details of the computer

2200/1631 . . . Panel PC, e.g. single housing hosting PC and display panel

2200/1632 . . . Pen holder integrated in the computer

2200/1633 . . . Protecting arrangement for the entire housing of the computer

2200/1634 . . . Integrated protective display lid, e.g. for touch-sensitive display in handheld computer

2200/1635 . . . Stackable modules

2200/1636 . . . Sensing arrangement for detection of a tap gesture on the housing

2200/1637 . . . Sensing arrangement for detection of housing movement or orientation, e.g. for controlling scrolling or cursor movement on the display of an handheld computer

2200/1638 . . . Computer housing designed to operate in both desktop and tower orientation

2200/1639 . . . Arrangements for locking plugged peripheral connectors

2200/20 . . . Indexing scheme relating to G06F 1/20

2200/201 . . . Cooling arrangements using cooling fluid

2200/202 . . . Air convective hinge

2200/203 . . . Heat conductive hinge

2200/26 . . . Indexing scheme relating to G06F 1/26

2200/261 . . . PC controlled powerstrip

2201/00 Indexing scheme relating to error detection, to error correction, and to monitoring

2201/08 . . . Database-specific techniques

2201/805 . . . Real-time

2201/81 . . . Threshold

2201/815 . . . Virtual (middleware or OS functionality using virtual machines to implement generic software techniques for error detection or fault masking G06F 11/1484)

2201/82 . . . Solving problems relating to consistency (ensuring consistency in mirrored systems G06F 11/2064)

2201/825 . . . the problem or solution involving locking

2201/83 . . . the solution involving signatures

2201/835 . . . Timestamp

2201/84 . . . Using snapshots, i.e. a logical point-in-time copy of the data

2201/845 . . . Systems in which the redundancy can be transformed in increased performance

2201/85 . . . Active fault masking without idle spares (active fault masking without idle spare hardware where processing functionality is redundant G06F 11/2035)

2201/855 . . . Details of asynchronous mirroring using a journal to transfer not-yet-mirrored changes

2201/86 . . . Event-based monitoring

2201/865 . . . Monitoring of software

2201/87 . . . Monitoring of transactions

2201/875 . . . Monitoring of systems including the internet

2201/88 . . . Monitoring involving counting

2201/885 . . . Monitoring specific for caches

2203/00 Indexing scheme relating to G06F 3/00 - G06F 3/048

2203/01 . . . Indexing scheme relating to G06F 3/01

2203/011 . . . Emotion or mood input determined on the basis of sensed human body parameters such as pulse, heart rate or beat, temperature of skin, facial expressions, iris, voice pitch, brain activity patterns

2203/012 . . . Walk-in-place systems for allowing a user to walk in a virtual environment while constraining him to a given position in the physical environment

2203/013 . . . Force feedback applied to a game

2203/014 . . . Force feedback applied to GUI

2203/015 . . . Force feedback applied to a joystick

2203/033 . . . Indexing scheme relating to G06F 3/033

2203/0331 . . . Finger worn pointing device

2203/0332 . . . Ergonomic shaped mouse adjustable to suit one of both hands

2203/0333 . . . Ergonomic shaped mouse for one hand

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Indexing scheme associated with group G06F30/00, relating to the purpose – mostly applicable to circuits – but also...
Indexing scheme relating to G06F 3/048

WARNING

Group G06F 2203/041 is impacted by reclassification into group G06F 2203/04114. Groups G06F 2203/041 and G06F 2203/04114 should be considered in order to perform a complete search.

Indexing scheme relating to G06F 3/048

WARNING

Group G06F 2203/041 is impacted by reclassification into group G06F 2203/04114. Groups G06F 2203/041 and G06F 2203/04114 should be considered in order to perform a complete search.
Indexing scheme relating to group **G06F 5/00**: Methods or arrangements for data conversion without changing the order or content of the data handled

Indexing scheme relating to groups **G06F 5/06** - **G06F 5/16**

Adapt frequency, i.e. clock frequency at one side is adapted to clock frequency, or average clock frequency, at the other side; Not pulse stuffing only

Allowing rewriting or rereading data to or from the buffer

Dynamically variable buffer size

Linked list, i.e. structure using pointers, e.g. allowing non-contiguous address segments in one logical buffer or dynamic buffer space allocation

With bypass possibility

User-programmable number or size of buffers, i.e. number of separate buffers or their size can be allocated freely

Bidirectional FIFO, i.e. system allowing data transfer in two directions

Indexing scheme relating to groups **G06F 5/10** - **G06F 5/14**

Avoiding metastability, i.e. preventing hazards, e.g. by using Gray code counters

Delay lines

Details of pointers, i.e. structure of the address generators

Reading or writing the data blockwise, e.g. using an extra end-of-block pointer

Indexing scheme relating to groups **G06F 5/12** - **G06F 5/14**

Contention resolution, i.e. resolving conflicts between simultaneous read and write operations

Monitoring of intermediate fill level, i.e. with additional means for monitoring the fill level, e.g. half full flag, almost empty flag

Indexing scheme related to dedicated interfaces for computers

Indexing scheme related to storage interfaces for computers, indexing schema related to group **G06F 3/06**

Defragmentation

Graphical user interface [GUI]

Load balancing

One time programmable [OTP] memory, e.g. PROM, WORM

Indexing scheme related to printer interfaces for computers, indexing schema related to group **G06F 3/12**

Cost estimation

Degraded mode, e.g. in view of consumables depleted, thresholds reached

Load balancing

Pre-printed media, e.g. media stock, forms, logos

Print-to a presentation device other than a printer, e.g. e-reader, e-paper, tablet

Sub-job

Indexing scheme related to audio interfaces for computers, indexing schema related to group **G06F 3/16**

Indexing scheme relating to methods or arrangements for processing data by operating upon the order or content of the data handled

Indexing scheme relating to groups **G06F 7/02** - **G06F 7/026**

String search, i.e. pattern matching, e.g. find identical word or best match in a string

Indexing scheme relating to groups **G06F 7/22** - **G06F 7/36**

Binary data tree

External sorting

Priority queue, i.e. 1 word in, 1 word out sorter; Output word, i.e. min or max of words in memory

Sorting or merging network

Indexing scheme relating to groups **G06F 7/38** - **G06F 7/575**

Details

concerning the type of numbers or the way they are handled

Devices capable of handling different types of numbers

Accepting numbers of variable word length

Reconfigurable for different fixed word lengths (multigauge devices **G06F 2207/3828**)

Accepting both fixed-point and floating-point numbers

Multigauge devices, i.e. capable of handling packed numbers without unpacking them

Less usual number representations

One’s complement

Octal

Hexadecimal

Unit distance code

Calculation with most significant digit first

Operand swapping

Special constructional features

Clockless, i.e. asynchronous operation used as a design principle ( **G06F 2207/3888** takes precedence)

Bypass control, i.e. possibility to transfer an operand unchanged to the output

Precharge of output to prevent leakage

Alternation of true and inverted stages

Skewing

Operand swapping

Wave pipelining, i.e. processing multiple subsequent operand sets asynchronously within each pipeline stage

Systolic array

Bit slicing

Indexing scheme relating to groups **G06F 7/48** - **G06F 7/575**

Special implementations

Associative memory or processor

Cascade or current mode logic

Charge transfer devices

Counters performing arithmetic operations

Multiplexers
Using pure decimal representation, e.g. 10-valued series of 16 possible 4 bit values of 3, rendering the code symmetrical within the 3, 4 and 0, 5 or 0, 2, 4, 6, 8 and 0, 1 respectively

Using Aiken code, i.e. using both first and last respectively

Using 5321 or 543210 code, i.e. binary coded respectively

Using 51111 code, i.e. binary coded decimal representation with digit weight of 5, 1, 1, 1 and 1 respectively

Using 5211 code, i.e. binary coded decimal representation with digit weight of 5, 2, 1 and 1 respectively

Using 5311 code, i.e. binary coded decimal representation with digit weight of 5, 3, 1 and 1 respectively

Using 5321 or 543210 code, i.e. binary coded decimal representation with digit weight of 5,(4,) 3, 2, 1 (and 0) respectively

Using 54321 code, i.e. binary coded decimal representation with digit weight of 5, 4, 3, 2 and 1 respectively

Using Aiken code, i.e. using both first and last 5 of 16 possible 4-bit values, rendering the code symmetrical within the series of 16 values

Using biquinary code, i.e. combination of 5-valued and 2-valued digits, having values 0, 1, 2, 3, 4 and 0, 5 or 0, 2, 4, 6, 8 and 0, 1 respectively

Using excess-3 code, i.e. natural BCD + offset of 3, rendering the code symmetrical within the series of 16 possible 4 bit values

Using pure decimal representation, e.g. 10-valued voltage signal, 1-out-of-10 code

Indexing scheme relating to groups G06F 7/492 - G06F 7/496

Single digit adding or subtracting
Calculation via prime subfield, i.e. the subfield being GF(p) with p an integer prime > 3; e.g. GF(p**) via GF(p)

Countermeasures against side channel or fault attacks

Randomisation as countermeasure against side channel attacks

Random curve masking, e.g. mapping to an isomorphic or projective curve

Masking, e.g. \( (A^{*e}+r) \mod n \)

Operand masking, i.e. message blinding, e.g. \( (A+r)^{*e} \mod n; k(P+R) \)

Exponent masking, i.e. key masking, e.g. \( A^{*e+(e+r)} \mod n; (k+r)P \)

Modulo masking, e.g. \( A^{*e} \mod (n*r) \)

Exponentiation, i.e. key masking, e.g. \( (A+r)^e \mod n; k.(P+R) \)

Additional details of aspects covered by group G06F 7/723

using repeated square-and-multiply, i.e. right-to-left binary exponentiation

using the window method, i.e. left-to-right k-ary exponentiation

Sliding-window exponentiation

using an addition chain, or an addition-subtraction chain

Indexing scheme relating to G06F 9/50

Resource availability

Resource capping

Clust

Constraint

Low-level

Monitor

Offload

Indexing scheme relating to G06F 9/52

Atomic

Manager

Mode

Indexing scheme relating to G06F 9/54

Client-server

Intercept

Local

Remote

Gui

Xcast

Messaging middleware

Queue

Remote execution

Indexing scheme relating to details of data-processing equipment not covered by groups G06F 3/00 - G06F 13/00

In-Line Device

Bus

Mutual Authentication Bi-Directional Authentication, Dialogue, Handshake

Notarisation, Time-Stamp, Date-Stamp

Network, LAN, Remote Access, Distributed System

Message, E-Mail

Encryption, En-/decode, En-/decipher, En-/decypher, Scramble, (De-)compress

Public Key, Asymmetric Key, Asymmetric Encryption

Trust

Indexing scheme relating to G06F 11/10

Indexing scheme relating to G06F 11/1076

Adaptive RAID, i.e. RAID system adapts to changing circumstances, e.g. RAID1 becomes RAID5 as disks fill up

Addressing errors, i.e. silent errors in RAID, e.g. sector slipping and addressing errors

Cache, i.e. caches used in RAID system with parity

Clustered RAID, i.e. clustered or de-clustered RAID where data and parity are spread over more disks than blocks in a parity group

Compression, i.e. RAID systems with parity using compression techniques

Continuous RAID, i.e. RAID system that allows streaming or continuous media, e.g. VOD

Fast writes, i.e. signaling the host that a write is done before data is written to disk

Different size blocks, i.e. mapping of blocks of different size in RAID systems with parity

Different size disks, i.e. non uniform size of disks in RAID systems with parity

Different size groups, i.e. non uniform size of groups in RAID systems with parity
2212/00  Indexing scheme relating to accessing, addressing or allocation within memory systems or architectures

2212/10  Providing a specific technical effect

2212/1004  Compatibility, e.g. with legacy hardware
2212/1008  Correctness of operation, e.g. memory ordering
2212/1012  Design facilitation
2212/1016  Performance improvement
2212/1021  Hit rate improvement
2212/1024  Latency reduction
2212/1028  Power efficiency
2212/1032  Reliability improvement, data loss prevention, degraded operation etc
2212/1036  Life time enhancement
2212/1041  Resource optimization
2212/1044  Space efficiency improvement
2212/1048  Scalability
2212/1052  Security improvement
2212/1056  Simplification
2212/1054  Hybrid cache memory, e.g. having both volatile and non-volatile portions
2212/1061  Non-volatile memory
2212/1065  Mainframe system
2212/1069  Electronic token or RFID
2212/1071  Power loss, i.e. interrupted writes due to power loss in a RAID system
2212/1073  Problems due to wear-out failures in RAID systems
2212/1076  RAIP, i.e. RAID on platters
2212/1078  RAIR, i.e. RAID on removable media
2212/1085  RMW, i.e. Read-Modify-Write method for RAID systems
2212/1088  Scrubbing in RAID systems with parity
2212/1097  Boot, Start, Initialise, Power
2211/00  Indexing scheme relating to accessing, addressing or allocation within memory systems or architectures
2211/01  Providing a specific technical effect
2212/251 . . Local memory within processor subsystem
2212/2515 . . being configurable for different purposes, e.g. as cache or non-cache memory
2212/253 . . Centralized memory
2212/2532 . . comprising a plurality of modules
2212/254 . . Distributed memory
2212/2542 . . Non-uniform memory access [NUMA] architecture
2212/256 . . Using a specific storage system architecture
2212/261 . . Storage comprising a plurality of storage devices
2212/262 . . configured as RAID
2212/263 . . Network storage, e.g. SAN or NAS
2212/264 . . Remote server
2212/27 . . Using a specific cache architecture
2212/271 . . Non-uniform cache access [NUCA] architecture
2212/272 . . Cache only memory architecture [COMA]
2212/28 . . Using a specific disk cache architecture
2212/281 . . Single cache
2212/282 . . Partitioned cache
2212/283 . . Plural cache memories
2212/284 . . being distributed
2212/285 . . Redundant cache memory
2212/286 . . Mirrored cache memory
2212/30 . . Providing cache or TLB in specific location of a processing system
2212/301 . . In special purpose processing node, e.g. vector processor
2212/302 . . In image processor or graphics adapter
2212/303 . . In peripheral interface, e.g. I/O adapter or channel
2212/3035 . . In peripheral device, e.g. printer
2212/304 . . In main memory subsystem
2212/3042 . . being part of a memory device, e.g. cache DRAM
2212/305 . . being part of a memory device, e.g. cache
2212/306 . . In system interconnect, e.g. between two buses
2212/31 . . Providing disk cache in a specific location of a storage system
2212/311 . . In host system
2212/312 . . In storage controller
2212/313 . . In storage device
2212/314 . . In storage network, e.g. network attached cache
2212/40 . . Specific encoding of data in memory or cache
2212/401 . . Compressed data
2212/402 . . Encrypted data
2212/403 . . Error protection encoding, e.g. using parity or ECC codes
2212/45 . . Caching of specific data in cache memory
2212/451 . . Stack data
2212/452 . . Instruction code
2212/453 . . Microcode or microprogram
2212/454 . . Vector or matrix data
2212/455 . . Image or video data
2212/46 . . Caching storage objects of specific type in disk cache
2212/461 . . Sector or disk block
2212/462 . . Track or segment
2212/463 . . File
2212/464 . . Multimedia object, e.g. image, video
2212/465 . . Structured object, e.g. database record
2212/466 . . Metadata, control data
2212/468 . . The specific object being partially cached
2212/50 . . Control mechanisms for virtual memory, cache or TLB
2212/502 . . using adaptive policy
2212/507 . . using speculative control
2212/60 . . Details of cache memory
2212/601 . . Reconfiguration of cache memory
2212/6012 . . of operating mode, e.g. cache mode or local memory mode
2212/602 . . Details relating to cache prefetching
2212/6022 . . Using a prefetch buffer or dedicated prefetch cache
2212/6024 . . History based prefetching
2212/6026 . . Prefetching based on access pattern detection, e.g. stride based prefetch
2212/6028 . . Prefetching based on hints or prefetch instructions
2212/603 . . of operating mode, e.g. cache mode or local memory mode
2212/6032 . . Way prediction in set-associative cache
2212/604 . . Details relating to cache allocation
2212/6042 . . Allocation of cache space to multiple users or processors
2212/6046 . . Using a specific cache allocation policy other than replacement policy
2212/606 . . Details relating to cache mapping
2212/6082 . . Way prediction in set-associative cache
2212/62 . . Details of cache specific to multiprocessor cache arrangements
2212/621 . . Coherency control relating to peripheral accessing, e.g. from DMA or I/O device
2212/622 . . State-only directory, i.e. not recording identity of sharing or owning nodes
2212/65 . . Details of virtual memory and virtual address translation
2212/651 . . Multi-level translation tables
2212/652 . . Page size control
2212/653 . . Page colouring
2212/654 . . Look-ahead translation
2212/655 . . Same page detection
2212/656 . . Address space sharing
2212/657 . . Virtual address space management
2212/668 . . Details of translation look-aside buffer [TLB]
2212/681 . . Multi-level TLB, e.g. microTLB and main TLB
2212/682 . . Multiprocessor TLB consistency
2212/683 . . invalidation
2212/684 . . TLB miss handling
2212/687 . . Details relating to dynamic memory management
2212/702 . . Conservative garbage collection
2212/702 . . Details relating to flash memory management
2212/701 . . Logical to physical mapping or translation of blocks or pages
2212/72 . . Allocation control and policies
2212/720 . . Temporary buffering, e.g. using volatile buffer or dedicated buffer blocks
2212/7204 . . Capacity control, e.g. partitioning, end-of-life degradation
2212/7205 . . Cleaning, compaction, garbage collection, erase control
2212/7206 . . Reconfiguration of flash memory system
2212/7207 . . management of metadata or control data
2212/7208 . . Multiple device management, e.g. distributing data over multiple flash devices
2212/7209 . . Validity control, e.g. using flags, time stamps or sequence numbers
Indexing scheme relating to interconnection of, or transfer of information or other signals between, memories, input/output devices or central processing units

2213/002 . . Serial port, e.g. RS232C
2213/0004 . . Parallel ports, e.g. centronics
2213/0006 . . Extension to the industry standard architecture [EISA]
2213/0008 . . High speed serial bus, e.g. Fiber channel
2213/0012 . . High speed serial bus, e.g. IEEE P1394
2213/0014 . . Futurebus
2213/0016 . . Inter-integrated circuit (I2C)
2213/0018 . . Industry standard architecture [ISA]
2213/0022 . . Multibus
2213/0024 . . Peripheral component interconnect [PCI]
2213/0026 . . PCI express
2213/0028 . . Serial attached SCSI [SAS]
2213/0032 . . Serial ATA [SATA]
2213/0034 . . Sun microsystems bus [SBus]
2213/0036 . . Small computer system interface [SCSI]
2213/0038 . . System on Chip
2213/0042 . . Universal serial bus [USB]
2213/0044 . . Versatile modular eurobus [VME]
2213/0052 . . Assignment of addresses or identifiers to the modules of a bus system
2213/0054 . . Split transaction bus
2213/0056 . . Use of address and non-data lines as data lines for specific data transfers to temporarily enlarge the data bus and increase information transfer rate
2213/0058 . . Bus-related hardware virtualisation
2213/0062 . . Bandwidth consumption reduction during transfers
2213/0064 . . Latency reduction in handling transfers
2213/16 . . Memory access
2213/1602 . . Memory access type
2213/24 . . Interrupt
2213/2402 . . Avoidance of interrupt starvation
2213/2404 . . Generation of an interrupt or a group of interrupts after a predetermined number of interrupts
2213/2406 . . Generation of an interrupt or a group of interrupts after a fixed or calculated time elapses
2213/2408 . . Reducing the frequency of interrupts generated from peripheral to a CPU
2213/2412 . . Dispatching of interrupt load among interrupt handlers in processor system or interrupt controller
2213/2414 . . Routing of interrupt among interrupt handlers in processor system or interrupt controller
2213/2416 . . Determination of the interrupt source among a plurality of incoming interrupts
2213/2418 . . Signal interruptions by means of a message
2213/2422 . . Sharing of interrupt line among a plurality of interrupt sources
2213/2424 . . Interrupt packet, e.g. event
2213/28 . . DMA
2213/2802 . . DMA using DMA transfer descriptors
2213/2804 . . Systems and methods for controlling the DMA frequency on an access bus
2213/2806 . . Space or buffer allocation for DMA transfers
2213/2808 . . Very long instruction word DMA
2213/36 . . Arbitration
2213/3602 . . Coding information on a single line

Indexing scheme relating to additional aspects of information retrieval not explicitly covered by G06F 16/00 and subgroups

2216/01 . . Automatic library building
2216/03 . . Data mining
2216/05 . . Energy-efficient information retrieval
2216/07 . . Guided tours
2216/09 . . Obsolescence
2216/11 . . Patent retrieval
2216/13 . . Prefetching
2216/15 . . Synchronised browsing
2216/17 . . Web printing

Indexing scheme relating to application aspects of data processing equipment or methods

2219/10 . . Environmental application, e.g. waste reduction, pollution control, compliance with environmental legislation

Indexing scheme relating to security arrangements for protecting computers, components thereof, programs or data against unauthorised activity

2221/03 . . Indexing scheme relating to G06F 21/50, monitoring users, programs or devices to maintain the integrity of platforms
2221/031 . . Protect user input by software means
2221/032 . . Protect output to user by software means
2221/033 . . Test or assess software
2221/034 . . Test or assess a computer or a system
2221/07 . . Indexing scheme relating to G06F 21/10, protecting distributed programs or content
2221/0702 . . Binding
2221/0704 . . Device
2221/0706 . . Domain
2221/0708 . . Location
2221/0711 . . Token
2221/0713 . . User
2221/0715 . . Characteristics
2221/0717 . . Domain
2221/072 . . Knowledge
2221/0722 . . Content
2221/0724 . . Editing
2221/0726 . . Personalisation
2221/0728 . . Conversion
2221/0731 . . On user or administrative requirements
2221/0733 . . Watermark
2221/0735 . . Restriction at operating system level
2221/0737 . . . Traceability
2221/074 . . . . . . Tracing pattern recognition
2221/0742 . . . . . . Enhanced product
2221/0744 . . . . . . Unique instance (G06F 2221/0702 takes precedence)
2221/0746 . . . . . . Emerging technologies
2221/0748 . . . . . . Hiding
2221/0751 . . . . . . Key
2221/0753 . . . . . . Distribution
2221/0755 . . . . . . Generation
2221/0757 . . . . . . Licence
2221/0759 . . . . . . Conversion
2221/0762 . . . . . . Definition
2221/0764 . . . . . . Grace period
2221/0766 . . . . . . Language
2221/0768 . . . . . . Editing
2221/0771 . . . . . . Revocation
2221/0773 . . . . . . Recurrent authorisation
2221/0775 . . . . . . Logging
2221/0777 . . . . . . Return
2221/0779 . . . . . . Transfer
2221/0782 . . . . . . Backup or restore
2221/0784 . . . . . . Fragments
2221/0786 . . . . . . Indirect via third party
2221/0788 . . . . . . Peer-to-Peer [P2P]
2221/0791 . . . . . . Superdistribution
2221/0793 . . . . . . Synchronisation
2221/0795 . . . . . . Transaction with ACID [Atomicity, Consistency, Isolation and Durability] properties
2221/0797 . . . . . . using dedicated hardware at the client
2221/01 . . . . . . . Indexing scheme relating to G06F 21/00 and subgroups addressing additional information or applications relating to security arrangements for protecting computers, components thereof, programs or data against unauthorised activity
2221/21 . . . . . . . Auditing as a secondary aspect
2221/203 . . . . . . . Challenge-response
2221/2105 . . . . . . . Dual mode as a secondary aspect
2221/2107 . . . . . . . File encryption
2221/2109 . . . . . . . Game systems
2221/2111 . . . . . . . Location-sensitive, e.g. geographical location, GPS
2221/2113 . . . . . . . Multi-level security, e.g. mandatory access control
2221/2115 . . . . . . . Third party
2221/2117 . . . . . . . User registration
2221/2119 . . . . . . . Authenticating web pages, e.g. with suspicious links
2221/2121 . . . . . . . Chip on media, e.g. a disk or tape with a chip embedded in its case
2221/2123 . . . . . . . Dummy operation
2221/2125 . . . . . . . Just-in-time application of countermeasures, e.g., on-the-fly decryption, just-in-time obfuscation or de-obfuscation
2221/2127 . . . . . . . Bluffing
2221/2129 . . . . . . . Authenticate client device independently of the user
2221/2131 . . . . . . . Lost password, e.g. recovery of lost or forgotten passwords
2221/2133 . . . . . . . Verifying human interaction, e.g., Captcha
2221/2135 . . . . . . . Metering
2221/2137 . . . . . . . Time limited access, e.g. to a computer or data

G06F