

# CPC COOPERATIVE PATENT CLASSIFICATION

## G PHYSICS (NOTES omitted)

### INSTRUMENTS

## G06 COMPUTING OR CALCULATING; COUNTING (NOTES omitted)

## G06V IMAGE OR VIDEO RECOGNITION OR UNDERSTANDING

### NOTES

1. This subclass covers:
  - methods or arrangements for pattern recognition or machine learning specially adapted for images or video.
2. In this subclass, the following terms or expressions are used with the meaning indicated:
  - "pattern recognition" means detection, categorisation, authentication and identification of patterns for explanatory purposes or to derive a certain meaning in images or video, by acquiring, preprocessing or extracting distinctive features and matching, clustering or classifying these features or representations thereof;
  - "feature extraction" means deriving descriptive or quantitative measures from images or video;
  - "clustering" means grouping or separating patterns according to their closeness or dissimilarity;
  - "classification" means the identification of an object/feature as belonging to a class of objects/features by assigning of a label.
3. In this subclass, subject matter classified in groups [G06V 20/00](#) - [G06V 40/00](#) is also classified in groups [G06V 10/10](#) or [G06V 10/20](#) respectively, if recognition relies on specific processing at the stages of acquisition or preprocessing.

<b>10/00</b>	<b>Arrangements for image or video recognition or understanding (character recognition in images or video <a href="#">G06V 30/10</a>)</b>	10/24	. . Aligning, centring, orientation detection or correction of the image
10/10	. Image acquisition (document image scanning and transmission <a href="#">H04N 1/00</a> ; control of digital cameras <a href="#">H04N 23/60</a> )	10/242	. . . {by image rotation, e.g. by 90 degrees}
10/12	. . Details of acquisition arrangements; Constructional details thereof	10/243	. . . {by compensating for image skew or non-uniform image deformations}
10/14	. . . Optical characteristics of the device performing the acquisition or on the illumination arrangements	10/245	. . . {by locating a pattern; Special marks for positioning}
10/141	. . . . Control of illumination	10/247	. . . {by affine transforms, e.g. correction due to perspective effects; Quadrilaterals, e.g. trapezoids}
10/143	. . . . Sensing or illuminating at different wavelengths	10/248	. . . {by interactive preprocessing or interactive shape modelling, e.g. feature points assigned by a user}
10/145	. . . . Illumination specially adapted for pattern recognition, e.g. using gratings	10/25	. . Determination of region of interest [ROI] or a volume of interest [VOI]
10/147	. . . . Details of sensors, e.g. sensor lenses (fingerprint or palmprint sensors <a href="#">G06V 40/13</a> ; vascular sensors <a href="#">G06V 40/145</a> ; eye sensors <a href="#">G06V 40/19</a> )	10/255	. . {Detecting or recognising potential candidate objects based on visual cues, e.g. shapes}
10/16	. . {using multiple overlapping images; Image stitching}	10/26	. . Segmentation of patterns in the image field; Cutting or merging of image elements to establish the pattern region, e.g. clustering-based techniques; Detection of occlusion
10/17	. . {using hand-held instruments}	10/267	. . . {by performing operations on regions, e.g. growing, shrinking or watersheds}
10/19	. . {by sensing codes defining pattern positions}	10/273	. . . {removing elements interfering with the pattern to be recognised}
10/20	. Image preprocessing	10/28	. . Quantising the image, e.g. histogram thresholding for discrimination between background and foreground patterns
10/22	. . by selection of a specific region containing or referencing a pattern; Locating or processing of specific regions to guide the detection or recognition	10/30	. . Noise filtering
10/225	. . . {based on a marking or identifier characterising the area}	10/32	. . Normalisation of the pattern dimensions
10/23	. . . {based on positionally close patterns or neighbourhood relationships}	10/34	. . Smoothing or thinning of the pattern; Morphological operations; Skeletonisation
10/235	. . . {based on user input or interaction}		

- 10/36 . . Applying a local operator, i.e. means to operate on image points situated in the vicinity of a given point; Non-linear local filtering operations, e.g. median filtering
- 10/40 . Extraction of image or video features
- 10/42 . . Global feature extraction by analysis of the whole pattern, e.g. using frequency domain transformations or autocorrelation
- 10/421 . . . {by analysing segments intersecting the pattern}
- 10/422 . . . for representing the structure of the pattern or shape of an object therefor
- 10/424 . . . . Syntactic representation, e.g. by using alphabets or grammars
- 10/426 . . . . Graphical representations
- 10/431 . . . {Frequency domain transformation; Autocorrelation}
- 10/435 . . . {Computation of moments}
- 10/44 . . Local feature extraction by analysis of parts of the pattern, e.g. by detecting edges, contours, loops, corners, strokes or intersections; Connectivity analysis, e.g. of connected components
- 10/443 . . . {by matching or filtering}
- 10/446 . . . . {using Haar-like filters, e.g. using integral image techniques}
- 10/449 . . . . {Biologically inspired filters, e.g. difference of Gaussians [DoG] or Gabor filters}
- 10/451 . . . . . {with interaction between the filter responses, e.g. cortical complex cells}
- 10/454 . . . . . {Integrating the filters into a hierarchical structure, e.g. convolutional neural networks [CNN]}
- 10/457 . . . {by analysing connectivity, e.g. edge linking, connected component analysis or slices}
- 10/46 . . Descriptors for shape, contour or point-related descriptors, e.g. scale invariant feature transform [SIFT] or bags of words [BoW]; Salient regional features (colour feature extraction G06V 10/56)
- 10/462 . . . {Salient features, e.g. scale invariant feature transforms [SIFT]}
- 10/464 . . . . {using a plurality of salient features, e.g. bag-of-words [BoW] representations}
- 10/467 . . . {Encoded features or binary features, e.g. local binary patterns [LBP]}
- 10/469 . . . {Contour-based spatial representations, e.g. vector-coding}
- 10/471 . . . . {using approximation functions}
- 10/473 . . . . {using gradient analysis}
- 10/476 . . . . {using statistical shape modelling, e.g. point distribution models}
- 10/478 . . . {Contour-based spectral representations or scale-space representations, e.g. by Fourier analysis, wavelet analysis or curvature scale-space [CSS]}
- 10/48 . . by mapping characteristic values of the pattern into a parameter space, e.g. Hough transformation
- 10/50 . . by performing operations within image blocks; by using histograms, e.g. histogram of oriented gradients [HoG]; by summing image-intensity values; Projection analysis
- 10/507 . . . {Summing image-intensity values; Histogram projection analysis}
- 10/513 . . {Sparse representations}
- 10/52 . . Scale-space analysis, e.g. wavelet analysis (multi-scale boundary representations G06V 10/42)
- 10/54 . . relating to texture
- 10/56 . . relating to colour
- 10/58 . . relating to hyperspectral data
- 10/60 . . relating to illumination properties, e.g. using a reflectance or lighting model
- 10/62 . . relating to a temporal dimension, e.g. time-based feature extraction; Pattern tracking
- 10/70 . . using pattern recognition or machine learning (optical pattern recognition or electronic computations therefor G06V 10/88)
- 10/72 . . Data preparation, e.g. statistical preprocessing of image or video features
- 10/74 . . Image or video pattern matching; Proximity measures in feature spaces
- 10/75 . . . Organisation of the matching processes, e.g. simultaneous or sequential comparisons of image or video features; Coarse-fine approaches, e.g. multi-scale approaches; using context analysis; Selection of dictionaries
- 10/751 . . . . {Comparing pixel values or logical combinations thereof, or feature values having positional relevance, e.g. template matching}
- 10/7515 . . . . . {Shifting the patterns to accommodate for positional errors}
- 10/752 . . . . {Contour matching}
- 10/753 . . . . {Transform-based matching, e.g. Hough transform}
- 10/754 . . . . {involving a deformation of the sample pattern or of the reference pattern; Elastic matching}
- 10/755 . . . . {Deformable models or variational models, e.g. snakes or active contours}
- 10/7553 . . . . . {based on shape, e.g. active shape models [ASM]}
- 10/7557 . . . . . {based on appearance, e.g. active appearance models [AAM]}
- 10/757 . . . . {Matching configurations of points or features}
- 10/758 . . . . {Involving statistics of pixels or of feature values, e.g. histogram matching}
- 10/759 . . . . {Region-based matching}
- 10/76 . . . . {based on eigen-space representations, e.g. from pose or different illumination conditions; Shape manifolds}
- 10/761 . . . {Proximity, similarity or dissimilarity measures}
- 10/762 . . using clustering, e.g. of similar faces in social networks
- 10/7625 . . . {Hierarchical techniques, i.e. dividing or merging patterns to obtain a tree-like representation; Dendograms}
- 10/763 . . . {Non-hierarchical techniques, e.g. based on statistics of modelling distributions}
- 10/7635 . . . {based on graphs, e.g. graph cuts or spectral clustering}
- 10/764 . . using classification, e.g. of video objects
- 10/765 . . . {using rules for classification or partitioning the feature space}
- 10/766 . . using regression, e.g. by projecting features on hyperplanes

10/768	. . {using context analysis, e.g. recognition aided by known co-occurring patterns}	10/92	. . {using spatial domain filters, e.g. joint transform correlators}
10/77	. . Processing image or video features in feature spaces; using data integration or data reduction, e.g. principal component analysis [PCA] or independent component analysis [ICA] or self-organising maps [SOM]; Blind source separation	10/94	. Hardware or software architectures specially adapted for image or video understanding
10/771	. . . Feature selection, e.g. selecting representative features from a multi-dimensional feature space	10/945	. . {User interactive design; Environments; Toolboxes}
10/7715	. . . {Feature extraction, e.g. by transforming the feature space, e.g. multi-dimensional scaling [MDS]; Mappings, e.g. subspace methods}	10/95	. . {structured as a network, e.g. client-server architectures}
10/772	. . . Determining representative reference patterns, e.g. averaging or distorting patterns; Generating dictionaries	10/955	. . {using specific electronic processors}
10/774	. . . Generating sets of training patterns; Bootstrap methods, e.g. bagging or boosting	10/96	. Management of image or video recognition tasks
10/7747	. . . . {Organisation of the process, e.g. bagging or boosting}	10/98	. Detection or correction of errors, e.g. by rescanning the pattern or by human intervention; Evaluation of the quality of the acquired patterns
10/7753	. . . . {Incorporation of unlabelled data, e.g. multiple instance learning [MIL]}	10/987	. . {with the intervention of an operator}
10/776	. . . Validation; Performance evaluation	10/993	. . {Evaluation of the quality of the acquired pattern}
10/778	. . . Active pattern-learning, e.g. online learning of image or video features	20/00	<b>Scenes; Scene-specific elements (control of digital cameras <a href="#">H04N 23/60</a>)</b>
10/7784	. . . . {based on feedback from supervisors}	<b>NOTE</b>	
10/7788	. . . . . {the supervisor being a human, e.g. interactive learning with a human teacher}	In this group, the following term is used with the meaning indicated:	
10/7792	. . . . . {the supervisor being an automated module, e.g. "intelligent oracle"}	• "scene" is a visual representation of the world or of some elements of it, as captured by a sensor or generated by a computer.	
10/7796	. . . . {based on specific statistical tests}		
10/80	. . . Fusion, i.e. combining data from various sources at the sensor level, preprocessing level, feature extraction level or classification level ( <a href="#">multimodal speaker identification or verification G10L 17/10</a> )	20/05	. Underwater scenes
10/803	. . . . {of input or preprocessed data}	20/10	. Terrestrial scenes ( <a href="#">scenes under surveillance with static cameras G06V 20/52</a> ; <a href="#">scenes perceived from the exterior of a vehicle G06V 20/56</a> ; <a href="#">scenes perceived from the interior of a vehicle G06V 20/59</a> )
10/806	. . . . {of extracted features}	20/13	. . Satellite images
10/809	. . . . {of classification results, e.g. where the classifiers operate on the same input data}	20/17	. . taken from planes or by drones
10/811	. . . . . {the classifiers operating on different input data, e.g. multi-modal recognition}	20/176	. . {Urban or other man-made structures}
10/814	. . . . {using belief theory, e.g. Dempster-Shafer}	20/182	. . {Network patterns, e.g. roads or rivers}
10/817	. . . . {by voting}	20/188	. . {Vegetation}
10/82	. . using neural networks	20/194	. . {using hyperspectral data, i.e. more or other wavelengths than RGB}
10/84	. . using probabilistic graphical models from image or video features, e.g. Markov models or Bayesian networks	20/20	. in augmented reality scenes
10/85	. . . {Markov-related models; Markov random fields}	20/30	. in albums, collections or shared content, e.g. social network photos or video
10/86	. . using syntactic or structural representations of the image or video pattern, e.g. symbolic string recognition; using graph matching	20/35	. {Categorising the entire scene, e.g. birthday party or wedding scene}
10/87	. . {using selection of the recognition techniques, e.g. of a classifier in a multiple classifier system}	20/36	. . {Indoor scenes}
10/88	. Image or video recognition using optical means, e.g. reference filters, holographic masks, frequency domain filters or spatial domain filters	20/38	. . {Outdoor scenes}
10/89	. . {using frequency domain filters, e.g. Fourier masks implemented on spatial light modulators}	20/39	. . . {Urban scenes}
10/893	. . . {characterised by the kind of filter}	20/40	. in video content ( <a href="#">extracting overlay text G06V 20/62</a> ; <a href="#">video retrieval G06F 16/70</a> ; <a href="#">processing of video elementary streams in video servers H04N 21/234</a> ; <a href="#">processing of video elementary streams in video clients H04N 21/44</a> )
10/895	. . . . {the filter being related to phase processing, e.g. phase-only filters}	20/41	. . {Higher-level, semantic clustering, classification or understanding of video scenes, e.g. detection, labelling or Markovian modelling of sport events or news items ( <a href="#">segmenting video sequences G06V 20/49</a> )}
10/898	. . . . {combination of filters, e.g. phase-only filters}	20/42	. . . {of sport video content}
		20/43	. . . {of news video content}
		20/44	. . {Event detection}
		20/46	. . {Extracting features or characteristics from the video content, e.g. video fingerprints, representative shots or key frames}
		20/47	. . . {Detecting features for summarising video content}

- 20/48 . . {Matching video sequences}
- 20/49 . . {Segmenting video sequences, i.e. computational techniques such as parsing or cutting the sequence, low-level clustering or determining units such as shots or scenes}
- 20/50 . Context or environment of the image
- 20/52 . . Surveillance or monitoring of activities, e.g. for recognising suspicious objects ([recognising microscopic objects G06V 20/69](#))
- 20/53 . . . {Recognition of crowd images, e.g. recognition of crowd congestion}
- 20/54 . . . of traffic, e.g. cars on the road, trains or boats
- 20/56 . . exterior to a vehicle by using sensors mounted on the vehicle
- 20/58 . . . Recognition of moving objects or obstacles, e.g. vehicles or pedestrians; Recognition of traffic objects, e.g. traffic signs, traffic lights or roads
- 20/582 . . . . {of traffic signs}
- 20/584 . . . . {of vehicle lights or traffic lights}
- 20/586 . . . . {of parking space}
- 20/588 . . . {Recognition of the road, e.g. of lane markings; Recognition of the vehicle driving pattern in relation to the road}
- 20/59 . . inside of a vehicle, e.g. relating to seat occupancy, driver state or inner lighting conditions
- 20/593 . . . {Recognising seat occupancy}
- 20/597 . . . {Recognising the driver's state or behaviour, e.g. attention or drowsiness}
- 20/60 . Type of objects
- 20/62 . . Text, e.g. of license plates, overlay texts or captions on TV images
- 20/625 . . . {License plates}
- 20/63 . . . {Scene text, e.g. street names}
- 20/635 . . . {Overlay text, e.g. embedded captions in a TV programme}
- 20/64 . . Three-dimensional [3D] objects
- 20/647 . . . {by matching two-dimensional images to three-dimensional objects}
- 20/653 . . . {by matching three-dimensional models, e.g. conformal mapping of Riemann surfaces}
- 20/66 . . Trinkets, e.g. shirt buttons or jewellery items ([recognising microscopic objects G06V 20/69](#))
- 20/68 . . Food, e.g. fruit or vegetables
- 20/69 . . Microscopic objects, e.g. biological cells or cellular parts
- 20/693 . . . {Acquisition}
- 20/695 . . . {Preprocessing, e.g. image segmentation}
- 20/698 . . . {Matching; Classification}
- 20/70 . Labelling scene content, e.g. deriving syntactic or semantic representations
- 20/80 . Recognising image objects characterised by unique random patterns
- 20/90 . Identifying an image sensor based on its output data
- 20/95 . {Pattern authentication; Markers therefor; Forgery detection}

**30/00**

**Character recognition; Recognising digital ink; Document-oriented image-based pattern recognition** ([scanning, transmission or reproduction of documents or the like H04N 1/00](#))

**NOTE**

This group covers recognition of characters or digital ink, where the characters or the digital ink can include representations in three dimensions [3D], e.g. as written by performing gestures in the air.

- 30/10 . Character recognition
- 30/12 . . Detection or correction of errors, e.g. by rescanning the pattern
- 30/127 . . . {with the intervention of an operator}
- 30/133 . . . {Evaluation of quality of the acquired characters}
- 30/14 . . Image acquisition
- 30/141 . . . {using multiple overlapping images; Image stitching}
- 30/142 . . . using hand-held instruments; Constructional details of the instruments
- 30/1423 . . . . {the instrument generating sequences of position coordinates corresponding to handwriting ([preprocessing or recognising digital ink G06V 30/32](#))}
- 30/1426 . . . . {by sensing position defining codes on a support}
- 30/1429 . . . {Identifying or ignoring parts by sensing at different wavelengths}
- 30/1431 . . . {Illumination control}
- 30/1434 . . . {Special illumination such as grating, reflections or deflections, e.g. for characters with relief}
- 30/1437 . . . {Sensor details, e.g. position, configuration or special lenses ([G06V 30/1429 takes precedence](#))}
- 30/144 . . . using a slot moved over the image; using discrete sensing elements at predetermined points; using automatic curve following means
- 30/1444 . . . {Selective acquisition, locating or processing of specific regions, e.g. highlighted text, fiducial marks or predetermined fields}
- 30/1448 . . . . {based on markings or identifiers characterising the document or the area}
- 30/1452 . . . . {based on positionally close symbols, e.g. amount sign or URL-specific characters}
- 30/1456 . . . . {based on user interactions}
- 30/146 . . . Aligning or centring of the image pick-up or image-field
- 30/1463 . . . . {Orientation detection or correction, e.g. rotation of multiples of 90 degrees}
- 30/1465 . . . . {by locating a pattern ([G06V 30/1475 takes precedence; centring within a document with a marking G06V 30/1448](#))}
- 30/1468 . . . . . {Special marks for positioning}
- 30/147 . . . . . {Determination of region of interest}
- 30/1473 . . . . . {Recognising objects as potential recognition candidates based on visual cues, e.g. shapes}
- 30/1475 . . . . . {Inclination or skew detection or correction of characters or of image to be recognised}
- 30/1478 . . . . . {of characters or characters lines}
- 30/148 . . . Segmentation of character regions



- 30/15 . . . . {Cutting or merging image elements, e.g. region growing, watershed or clustering-based techniques}
- 30/153 . . . . {using recognition of characters or words}
- 30/155 . . . . {Removing patterns interfering with the pattern to be recognised, such as ruled lines or underlines}
- 30/158 . . . . {using character size, text spacings or pitch estimation}
- 30/16 . . Image preprocessing
- 30/1607 . . . {Correcting image deformation, e.g. trapezoidal deformation caused by perspective}
- 30/1613 . . . {Interactive preprocessing or shape modelling, e.g. assignment of feature points by a user}
- 30/162 . . . Quantising the image signal
- 30/164 . . . Noise filtering
- 30/166 . . . Normalisation of pattern dimensions
- 30/168 . . . Smoothing or thinning of the pattern; Skeletonisation
- 30/18 . . Extraction of features or characteristics of the image
- 30/1801 . . . {Detecting partial patterns, e.g. edges or contours, or configurations, e.g. loops, corners, strokes or intersections (extracting features by contour coding [G06V 30/182](#))}
- 30/18019 . . . . {by matching or filtering}
- 30/18029 . . . . {filtering with Haar-like subimages, e.g. computation thereof with the integral image technique}
- 30/18038 . . . . {Biologically-inspired filters, e.g. difference of Gaussians [DoG], Gabor filters}
- 30/18048 . . . . . {with interaction between the responses of different filters, e.g. cortical complex cells}
- 30/18057 . . . . . {Integrating the filters into a hierarchical structure, e.g. convolutional neural networks [CNN]}
- 30/18067 . . . . {by mapping characteristic values of the pattern into a parameter space, e.g. Hough transformation}
- 30/18076 . . . . {by analysing connectivity, e.g. edge linking, connected component analysis or slices}
- 30/18086 . . . {by performing operations within image blocks or by using histograms}
- 30/18095 . . . . {Summing image-intensity values; Projection and histogram analysis}
- 30/18105 . . . {related to colour}
- 30/18114 . . . {involving specific hyperspectral computations of features}
- 30/18124 . . . {related to illumination properties, e.g. according to a reflectance or lighting model}
- 30/18133 . . . {regional/local feature not essentially salient, e.g. local binary pattern}
- 30/18143 . . . {Extracting features based on salient regional features, e.g. scale invariant feature transform [SIFT] keypoints}
- 30/18152 . . . . {Extracting features based on a plurality of salient regional features, e.g. "bag of words"}
- 30/18162 . . . {related to a structural representation of the pattern}
- 30/18171 . . . . {Syntactic representation, e.g. using a grammatical approach}
- 30/18181 . . . . {Graphical representation, e.g. directed attributed graph}
- 30/1819 . . . {sparse representations}
- 30/182 . . . by coding the contour of the pattern
- 30/1823 . . . . {using vector-coding}
- 30/1826 . . . . {analysing the spectrum of the contour, e.g. Fourier expansion}
- 30/1829 . . . . {using an approximation function}
- 30/1831 . . . . {using gradient analysis}
- 30/1834 . . . . {using statistical shape modelling, e.g. point distribution model}
- 30/1837 . . . . {using wavelet analysis}
- 30/184 . . . by analysing segments intersecting the pattern
- 30/186 . . . by deriving mathematical or geometrical properties from the whole image
- 30/187 . . . . {Frequency domain transformation; Autocorrelation}
- 30/188 . . . . {Computation of moments}
- 30/189 . . . . {Scale-space domain transformation, e.g. with wavelet analysis}
- 30/19 . . Recognition using electronic means
- 30/19007 . . . {Matching; Proximity measures}
- 30/19013 . . . . {Comparing pixel values or logical combinations thereof, or feature values having positional relevance, e.g. template matching ([specially adapted for image segmentation G06T 7/10](#); [specially adapted for the analysis of motion G06T 7/20](#); [specially adapted for image alignment G06T 7/30](#); [specially adapted for the calculation of depth from stereo images G06T 7/50](#); [specially adapted for position determination G06T 7/70](#))}
- 30/1902 . . . . . {Shifting or otherwise transforming the patterns to accommodate for positional errors}
- 30/19027 . . . . . {Matching of contours}
- 30/19033 . . . . . {by mapping curve parameters onto an accumulator array, e.g. generalised Hough Transform}
- 30/1904 . . . . . {involving a deformation of the sample or reference pattern; Elastic matching}
- 30/19047 . . . . . {based on a local optimisation criterion, e.g. "snakes", i.e. active contour models of the pattern to be recognised}
- 30/19053 . . . . . {based on shape statistics, e.g. active shape models of the pattern to be recognised}
- 30/1906 . . . . . {based also on statistics of image patches, e.g. active appearance models of the pattern to be recognised}
- 30/19067 . . . . . {Matching configurations of points or features, e.g. constellation matching}
- 30/19073 . . . . {Comparing statistics of pixel or of feature values, e.g. histogram matching}
- 30/1908 . . . . {Region based matching}
- 30/19087 . . . . {based on parametric eigenspace representations, e.g. eigenspace representations using pose or illumination parameters; Shape manifold}
- 30/19093 . . . . {Proximity measures, i.e. similarity or distance measures}

- 30/191 . . . {Design or setup of recognition systems or techniques; Extraction of features in feature space; Clustering techniques; Blind source separation}
- 30/19107 . . . . {Clustering techniques}
- 30/19113 . . . . {Selection of pattern recognition techniques, e.g. of classifiers in a multi-classifier system}
- 30/1912 . . . . {Selecting the most significant subset of features ([G06V 30/19127 takes precedence](#))}
- 30/19127 . . . . {Extracting features by transforming the feature space, e.g. multidimensional scaling; Mappings, e.g. subspace methods}
- 30/19133 . . . . {Interactive pattern learning with a human teacher}
- 30/1914 . . . . {Determining representative reference patterns, e.g. averaging or distorting patterns; Generating dictionaries, e.g. user dictionaries}
- 30/19147 . . . . {Obtaining sets of training patterns; Bootstrap methods, e.g. bagging or boosting}
- 30/19153 . . . . {using rules for classification or partitioning the feature space}
- 30/1916 . . . . {Validation; Performance evaluation}
- 30/19167 . . . . {Active pattern learning}
- 30/19173 . . . . {Classification techniques}
- 30/1918 . . . . {Fusion techniques, i.e. combining data from various sources, e.g. sensor fusion}
- 30/19187 . . . . {Graphical models, e.g. Bayesian networks or Markov models}
- 30/19193 . . . {Statistical pre-processing, e.g. techniques for normalisation or restoring missing data}
- 30/192 . . . using simultaneous comparisons or correlations of the image signals with a plurality of references
- 30/194 . . . . References adjustable by an adaptive method, e.g. learning
- 30/195 . . . . {using a resistor matrix}
- 30/196 . . . using sequential comparisons of the image signals with a plurality of references
- 30/198 . . . . the selection of the next reference depending on the result of the preceding comparison
- 30/1983 . . . . {Syntactic or structural pattern recognition, e.g. symbolic string recognition}
- 30/1985 . . . . . {Syntactic analysis, e.g. using a grammatical approach ([syntactic image representation G06V 30/18171](#))}
- 30/1988 . . . . . {Graph matching ([graphical image representation G06V 30/18181](#))}
- 30/199 . . Arrangements for recognition using optical reference masks, e.g. holographic masks
- 30/20 . . Combination of acquisition, preprocessing or recognition functions
- 30/22 . . characterised by the type of writing
- 30/222 . . . of characters separated by spaces
- 30/224 . . . of printed characters having additional code marks or containing code marks
- 30/2247 . . . . {Characters composed of bars, e.g. CMC-7}
- 30/2253 . . . . {Recognition of characters printed with magnetic ink ([G06V 30/2247 takes precedence](#))}
- 30/226 . . . of cursive writing
- 30/2264 . . . . {using word shape}
- 30/2268 . . . . {using stroke segmentation}
- 30/2272 . . . . . {with lexical matching}
- 30/2276 . . . . . {with probabilistic networks, e.g. hidden Markov models}
- 30/228 . . . of three-dimensional [3D] handwriting, e.g. writing in the air
- 30/24 . . characterised by the processing or recognition method ([segmentation of character regions G06V 30/148](#))
- 30/242 . . . Division of the character sequences into groups prior to recognition; Selection of dictionaries
- 30/244 . . . . using graphical properties, e.g. alphabet type or font
- 30/2445 . . . . . {Alphabet recognition, e.g. Latin, Kanji or Katakana}
- 30/245 . . . . . {Font recognition}
- 30/2455 . . . . . {Discrimination between machine-print, hand-print and cursive writing}
- 30/246 . . . . using linguistic properties, e.g. specific for English or German language
- 30/248 . . . {involving plural approaches, e.g. verification by template match; Resolving confusion among similar patterns, e.g. "O" versus "Q" ([G06V 30/242 takes precedence](#))}
- 30/2504 . . . . {Coarse or fine approaches, e.g. resolution of ambiguities or multiscale approaches}
- 30/2528 . . . . {Combination of methods, e.g. classifiers, working on the same input data}
- 30/2552 . . . . {Combination of methods, e.g. classifiers, working on different input data, e.g. sensor fusion}
- 30/26 . . Techniques for post-processing, e.g. correcting the recognition result
- 30/262 . . . using context analysis, e.g. lexical, syntactic or semantic context
- 30/268 . . . . {Lexical context}
- 30/274 . . . . {Syntactic or semantic context, e.g. balancing}
- 30/28 . . specially adapted to the type of the alphabet, e.g. Latin alphabet
- 30/287 . . . {of Kanji, Hiragana or Katakana characters}
- 30/293 . . . {of characters other than Kanji, Hiragana or Katakana}
- 30/30 . . based on the type of data
- 30/302 . . . Images containing characters for discriminating human versus automated computer access
- 30/304 . . . Music notations
- 30/32 . . Digital ink
- 30/333 . . . {Preprocessing; Feature extraction}
- 30/347 . . . . {Sampling; Contour coding; Stroke extraction}
- 30/36 . . . {Matching; Classification}
- 30/373 . . . . {using a special pattern or subpattern alphabet}
- 30/387 . . . . {using human interaction, e.g. selection of the best displayed recognition candidate}
- 30/40 . Document-oriented image-based pattern recognition
- 30/41 . . Analysis of document content ([recognition of printed characters based on code marks G06V 30/224](#))
- 30/412 . . . Layout analysis of documents structured with printed lines or input boxes, e.g. business forms or tables
- 30/413 . . . Classification of content, e.g. text, photographs or tables

30/414	. . . Extracting the geometrical structure, e.g. layout tree; Block segmentation, e.g. bounding boxes for graphics or text	40/161	. . . {Detection; Localisation; Normalisation}
30/416	. . . Extracting the logical structure, e.g. chapters, sections or page numbers; Identifying elements of the document, e.g. authors	40/162	. . . . {using pixel segmentation or colour matching}
30/418	. . . Document matching, e.g. of document images	40/164	. . . . {using holistic features}
30/42	. . based on the type of document	40/165	. . . . {using facial parts and geometric relationships}
30/422	. . . Technical drawings; Geographical maps	40/166	. . . . {using acquisition arrangements}
30/424	. . . Postal images, e.g. labels or addresses on parcels or postal envelopes	40/167	. . . . {using comparisons between temporally consecutive images}
30/43	. . {Editing text-bitmaps, e.g. alignment, spacing; Semantic analysis of bitmaps of text without OCR}	40/168	. . . {Feature extraction; Face representation}
<b>40/00</b>	<b>Recognition of biometric, human-related or animal-related patterns in image or video data</b>	40/169	. . . . {Holistic features and representations, i.e. based on the facial image taken as a whole}
40/10	. Human or animal bodies, e.g. vehicle occupants or pedestrians; Body parts, e.g. hands	40/171	. . . . {Local features and components; Facial parts (eye characteristics G06V 40/18); Occluding parts, e.g. glasses; Geometrical relationships}
40/103	. . {Static body considered as a whole, e.g. static pedestrian or occupant recognition}	40/172	. . . {Classification, e.g. identification}
40/107	. . {Static hand or arm}	40/173	. . . . {face re-identification, e.g. recognising unknown faces across different face tracks}
40/11	. . . {Hand-related biometrics; Hand pose recognition}	40/174	. . . {Facial expression recognition}
40/113	. . . {Recognition of static hand signs}	40/175	. . . . {Static expression}
40/117	. . . {Biometrics derived from hands}	40/176	. . . . {Dynamic expression}
40/12	. . Fingerprints or palmprints	40/178	. . . {estimating age from face image; using age information for improving recognition}
40/13	. . . Sensors therefor	40/179	. . . {metadata assisted face recognition}
40/1306	. . . . {non-optical, e.g. ultrasonic or capacitive sensing}	40/18	. . Eye characteristics, e.g. of the iris
40/1312	. . . . {direct reading, e.g. contactless acquisition}	40/19	. . . Sensors therefor
40/1318	. . . . {using electro-optical elements or layers, e.g. electroluminescent sensing}	40/193	. . . {Preprocessing; Feature extraction}
40/1324	. . . . {by using geometrical optics, e.g. using prisms (G06V 40/1312 takes precedence)}	40/197	. . . {Matching; Classification}
40/1329	. . . . {Protecting the fingerprint sensor against damage caused by the finger}	40/20	. Movements or behaviour, e.g. gesture recognition (recognition of facial expressions G06V 40/16)
40/1335	. . . {Combining adjacent partial images (e.g. slices) to create a composite input or reference pattern; Tracking a sweeping finger movement}	40/23	. . {Recognition of whole body movements, e.g. for sport training}
40/1341	. . . {Sensing with light passing through the finger}	40/25	. . . {Recognition of walking or running movements, e.g. gait recognition}
40/1347	. . . {Preprocessing; Feature extraction}	40/28	. . {Recognition of hand or arm movements, e.g. recognition of deaf sign language (static hand signs G06V 40/113)}
40/1353	. . . . {Extracting features related to minutiae or pores}	40/30	. Writer recognition; Reading and verifying signatures
40/1359	. . . . {Extracting features related to ridge properties; Determining the fingerprint type, e.g. whorl or loop}	40/33	. . {based only on signature image, e.g. static signature recognition}
40/1365	. . . {Matching; Classification}	40/37	. . {based only on signature signals such as velocity or pressure, e.g. dynamic signature recognition}
40/1371	. . . . {Matching features related to minutiae or pores}	40/376	. . . {Acquisition}
40/1376	. . . . {Matching features related to ridge properties or fingerprint texture}	40/382	. . . {Preprocessing; Feature extraction}
40/1382	. . . {Detecting the live character of the finger, i.e. distinguishing from a fake or cadaver finger}	40/388	. . . . {Sampling; Contour coding; Stroke extraction}
40/1388	. . . . {using image processing}	40/394	. . . {Matching; Classification}
40/1394	. . . . {using acquisition arrangements}	40/40	. Spoof detection, e.g. liveness detection
40/14	. . Vascular patterns	40/45	. . {Detection of the body part being alive}
40/145	. . . Sensors therefor	40/50	. Maintenance of biometric data or enrolment thereof
40/15	. . {Biometric patterns based on physiological signals, e.g. heartbeat, blood flow}	40/53	. . {Measures to keep reference information secret, e.g. cancellable biometrics}
40/155	. . {use of biometric patterns for forensic purposes}	40/55	. . {Performing matching on a personal external card, e.g. to avoid submitting reference information}
40/16	. . Human faces, e.g. facial parts, sketches or expressions	40/58	. . {Solutions for unknown imposter distribution}
		40/60	. Static or dynamic means for assisting the user to position a body part for biometric acquisition
		40/63	. . {by static guides}
		40/67	. . {by interactive indications to the user}

- 40/70 . Multimodal biometrics, e.g. combining information from different biometric modalities

**2201/00 Indexing scheme relating to image or video recognition or understanding**

- 2201/01 . Solutions for problems related to non-uniform document background
- 2201/02 . Recognising information on displays, dials, clocks
- 2201/03 . Recognition of patterns in medical or anatomical images
  - 2201/031 . . of internal organs
  - 2201/032 . . of protuberances, polyps nodules, etc.
  - 2201/033 . . of skeletal patterns
  - 2201/034 . . of medical instruments
- 2201/04 . Recognition of patterns in DNA microarrays
- 2201/05 . Recognition of patterns representing particular kinds of hidden objects, e.g. weapons, explosives, drugs
- 2201/06 . Recognition of objects for industrial automation
- 2201/07 . Target detection
- 2201/08 . Detecting or categorising vehicles
- 2201/09 . Recognition of logos
- 2201/10 . Recognition assisted with metadata
- 2201/11 . Technique with transformation invariance effect
- 2201/12 . Acquisition of 3D measurements of objects
  - 2201/121 . . using special illumination
  - 2201/122 . . Computational image acquisition in electron microscopy
- 2201/13 . Type of disclosure document
  - 2201/131 . . Book
  - 2201/132 . . Book chapter
  - 2201/133 . . Survey article
  - 2201/134 . . Technical report or standard
  - 2201/135 . . Master, PhD or other thesis
  - 2201/136 . . Tutorial