EUROPEAN PATENT OFFICE
U.S. PATENT AND TRADEMARK OFFICE

CPC NOTICE OF CHANGES 268

DATE: JANUARY 1, 2018

PROJECT DP0185

The following classification changes will be effected by this Notice of Changes:

Action	Subclass	Group(s)
DEFINITIONS:		
Definitions New:	G06T	7/10, 7/30, 7/50, 7/521, 7/55, 7/586, 7/593, 7/70, 7/80
Definitions Modified:	G06T	subclass
	G06T	7/00, 7/20, 7/40, 7/60

No other subclasses/groups are impacted by this Notice of Changes.

This Notice of Changes includes the following *[Check the ones included]*:

1. CLASSIFICATION SCHEME CHANGES

    ☐ A. New, Modified or Deleted Group(s)

    ☐ B. New, Modified or Deleted Warning(s)

    ☐ C. New, Modified or Deleted Note(s)

    ☐ D. New, Modified or Deleted Guidance Heading(s)

2. DEFINITIONS

    ☒ A. New or Modified Definitions (Full definition template)

    ☐ B. Modified or Deleted Definitions (Definitions Quick Fix)

3. ☐ REVISION CONCORDANCE LIST (RCL)

4. ☐ CHANGES TO THE CPC-TO-IPC CONCORDANCE LIST (CICL)

5. ☐ CHANGES TO THE CROSS-REFERENCE LIST (CRL)

2. A. DEFINITIONS (New)

Insert the following <u>new</u> definitions.

G06T7/10

Definition statement

This place covers:

- Segmentation, i.e. partitioning an image into regions
- Edge detection, i.e. detection of edge features in an image

References

Limiting references

This place does not cover:

Motion-based segmentation	G06T7/215

Application-oriented references

Examples of places where the subject matter of this place is covered when specially

adapted, used for a particular purpose, or incorporated in a larger system:

Separation of touching or overlapping patterns for pattern recognition,e.g. character segmentation for optical character recognition (OCR)	G06K9/34
Extraction of image features/characteristics for pattern recognition	G06K9/46
Detecting partial patterns, e.g. edges or contours, or configurations, e.g. loops, corners, strokes, intersections, for pattern recognition	G06K9/4604

Informative references

Analysis of texture	G06T7/40
Determination of colour characteristics	G06T7/90
Feature extraction related to colour, for pattern recognition	G06K9/4652
Clustering techniques in pattern recognition	G06K9/6218
Classification techniques in pattern recognition	G06K9/6267

Special rules of classification within this group

In this group, multi-aspect classification is applied. Specifically, where classification is made in G06T7/11, G06T7/12 or G06T7/13, classification should also be made in the relevant groups G06T7/136 to G06T7/194.

Further segmentation details are covered by the subgroups of Indexing Code G06T2207/20112. Where classification is made in G06T7/11, G06T7/12 or G06T7/13, classification should also be made in the relevant groups G06T2207/20116 to G06T2207/20168.

G06T7/30

Definition statement

This place covers:

Image analysis algorithms for determining geometric transformations required to register (i.e. align) separate images. The process involves the estimation of transform parameters. Registration means determining the alignment of images or finding their relative position.

- Registration of image subparts for the construction of mosaics image
- Multi-modal, cross-modal, across-modal registration of medical image data sets
- Registration with medical atlas Registration of pre-operative and intra-operative medical image data sets
- Registration for change detection in biomedical or remote sensing images (change detection see also G06T7/20)
- Registration of models
- Registration of a model with an image
- Registration of range data, point clouds (ICP algorithm)
- 2D/2D, 2D/3D, 3D/3D registration
- Interactive registration

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Recognising three-dimensional objects, e.g. range data matching for pattern recognition	G06K9/00201
Segmentation involving deformable models	G06T7/149

Informative references

Attention is drawn to the following places, which may be of interest for search:

Combining images from different aspect angles, e.g. spatial compounding	G01S15/8995
Image matching for pattern recognition or image matching in general	G06K9/6201
Comparing pixel values or logical combinations thereof, e.g. template matching	G06K9/6202
Geometric image transformation in the plane of the image for image registration	G06T3/0068
Analysis of motion	G06T7/20

Special rules of classification

For registration of medical image data, an Indexing Code from the range of G06T2207/30004 to G06T2207/30104 (Biomedical image processing) should be added.

For involving image mosaicing, Indexing Code G06T2200/32 should be added.

For Interactive image processing based on input by user, an Indexing Code from the range of G06T2207/20092 to G06T2207/20108 should be added.

Synonyms and Keywords

In patent documents, the following words/expressions are often used with the meaning indicated:

Recalage (French)	Registration (English)

G06T7/50

Definition statement

This place covers:

- Image analysis algorithms for determining scene depth parameters from image characteristics.
- Shape from X
- Depth map determination
- Disparity calculation for shape recovery

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Picture taking arrangements specially adapted for photogrammetry or photographic surveying	G01C11/02
LIDAR systems for mapping or imaging	G01S 17/89

G06T7/521

Definition statement

This place covers:

Illustrative example:

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Image acquisition and arrangements for measuring contours or curvatures of an object by projecting a pattern thereupon	G01B11/25

Glossary of terms

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

Structured	characterises the illumination

G06T7/55

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially

adapted, used for a particular purpose, or incorporated in a larger system:

Volumetric display with depth sampling, i.e. the volume being constructed from a stack or sequence of 2D image planes	H04N13/0488

Informative references

Attention is drawn to the following places, which may be of interest for search:

Determining parameters from multiple pictures, e.g. disparity calculation as such	G06T7/97

Special rules of classification

For documents concerning trilinear computations, trifocal tensor: add the Indexing Code G06T2207/20088: Trinocular vision calculations; trifocal tensor.

G06T7/586

## Definition statement

This place covers:

Algorithms for the determination of scene depth parameters from multiple images for which more than one source of illumination has been used. Typically, different illumination sources are used when capturing each of the multiple images to produce different images of the same scene under the different lighting conditions. The different images are used to determine depth and shape parameters in the scene.

- Different illumination intensities, e.g. ambient and flash
- Different directions of illumination

Illustrative example:
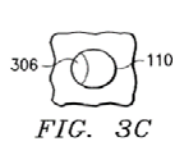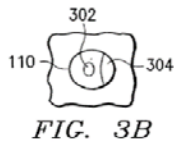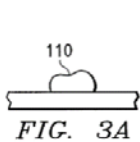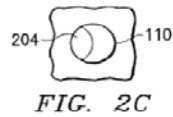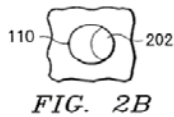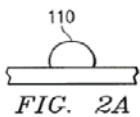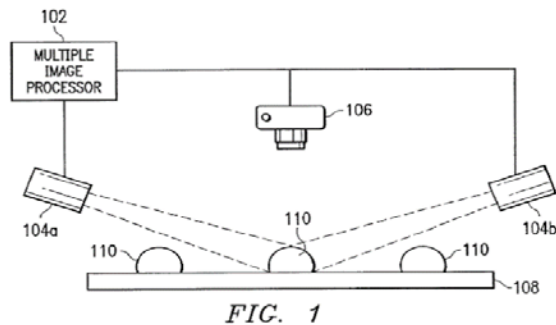
FIG. 1

FIG. 2A   FIG. 2B   FIG. 2C

FIG. 3A   FIG. 3B   FIG. 3C

Glossary of terms

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

Photometric stereo	a technique for estimating the normal vectors at different points on an object's surface by observing the object under different lighting conditions.

G06T7/593

Definition statement

This place covers:

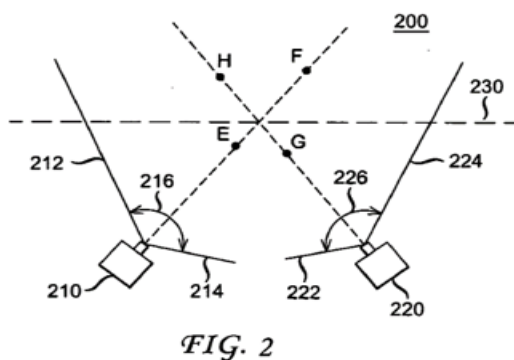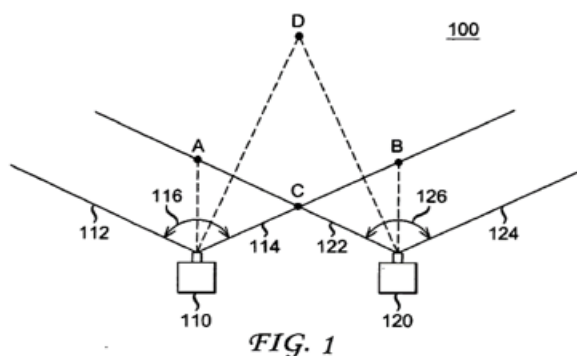Shape from stereo images or sequences of stereo images

Illustrative example:

FIG. 1

FIG. 2

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially

adapted, used for a particular purpose, or incorporated in a larger system:

Stereo video generation based on depth image-based rendering (DIBR)	H04N13/0271
Stereoscopic or multiview image generation wherein the generated image signals comprise depth maps or disparity maps	H04N13/0271

Informative references

Attention is drawn to the following places, which may be of interest for search:

Depth or shape recovery from multiple images using trilinear computations / the trifocal tensor	G06T7/55, G06T2207/20088
Depth or shape recovery from multiple images using the quadrifocal tensor	G06T7/55

G06T7/70

Definition statement

This place covers:

- Image processing algorithms for determining the position or orientation of an image subject, or of the camera having acquired the image.
- Position or orientation of the camera
- Estimation of position, pose, posture, attitude in 2D and 3D
- Gaze direction, head pose
- Bin picking

References

Limiting references

This place does not cover:

Camera calibration	G06T7/80

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Acquiring or recognising human faces, facial parts, facial sketches, facial expressions, eyes	G06K9/00221, G06K9/00597
Orientation detection before recognition	G06K9/3208

Informative references

Attention is drawn to the following places, which may be of interest for search:

Measuring position in terms of linear or angular dimensions	G01B
Mask, wafer positioning, alignment	H01L21/681
Studio circuitry, e.g. for position determination of a camera in a television studio	H04N5/222
Locating or presence-detecting by the use of the reflection or reradiation of radio or other waves	G01S
Matching for pattern recognition	G06K9/6201
Image feed-back for automatic industrial control	G06T1/0014
Analysis of motion	G06T7/20
Aligning or positioning of tools relative to the circuit board for manufacturing printed circuits	H05K3/0008

Special rules of classification

For camera pose, Indexing Code G06T2207/30244 should be added. For workpiece; machine component, Indexing Code G06T2207/30164 should be added.

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "Repérage" (in French documents), "location", and "locating"

G06T7/80

Definition statement

This place covers:

The use of methods/algorithms to analyse camera images for the determination of intrinsic parameters defining the camera's properties, or for the determination of extrinsic parameters defining the camera's position and orientation. Camera calibration enables pixel positions in a captured 2D image to be mapped to real-world 3D coordinates of the subject represented in the image.
Illustrative example:
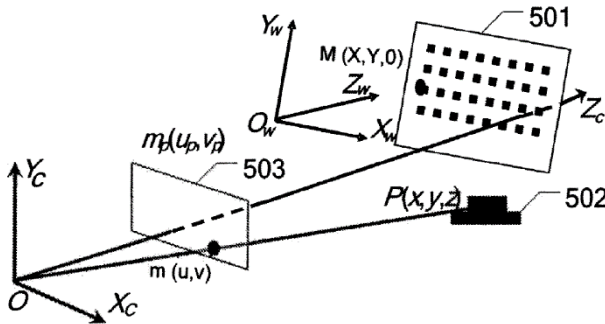
References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Calibration patterns	G01B21/042, G01C15/02
Systems for automatic generation of focusing signals	G02B7/28
Focusing aids for cameras; Autofocus systems for cameras	G03B13/00
Geometric correction, e.g. of lens distortion	G06T5/006
Determining position or orientation of objects, e.g. of the camera, without calibration context	G06T7/70, G06T2207/30244
Colour balance, e.g. colour cast correction	H04N1/6077
Suppressing or minimising disturbance in picture signal generation	H04N5/217
Picture signal generators using solid state devices, e.g. correction of chromatic aberrations	H04N9/045
Calibration of stereoscopic cameras	H04N 13/0246

Glossary of terms

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

Intrinsic parameters	The geometric and optical characteristics of a camera, including effective focal length, a scale factor and the image centre or "principal point".
Extrinsic parameters	The three-dimensional position and orientation of the camera in real-world coordinates.

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms.

- "Camera calibration", "Geometric camera calibration", and "Camera re-sectioning".

2. A. DEFINITIONS (Modified)

G06T

Delete: All of the existing bulleted statements in the definition statement section.

- General purpose image data processing.
- Geometric image transformations in the plane of the image, e.g. from bit-mapped to bit-mapped
creating a different image.
- Image enhancement or restoration, e.g. from bit-mapped to bit-mapped creating a similar image.
- Image analysis, e.g. from bit-mapped to non bit-mapped.
- Image coding, e.g. from bit-mapped to non bit-mapped.
- Two Dimensional image generation.
- Animation.
- Three Dimensional image rendering.
- Three-dimensional modelling, e.g. data description of 3D objects.
- Manipulating 3D models or images for computer graphics.

Insert: The following replacement statements.

- Processor architectures or memory management for general purpose image data processing
- Geometric image transformations
- Image enhancement or restoration
- Image analysis
- Image coding
- Two-dimensional image generation
- Animation
- Three-dimensional image rendering
- Three-dimensional modelling for computer graphics
- Manipulating three-dimensional models or images for computer graphics

Relationships with other classification places

Delete: The existing paragraph in Relationships with other classification places.

Insert: The following replacement paragraph.

G06T is the functional place for image data processing or generation. Image data processing or generation specially adapted for a particular application is classified in the relevant subclass. Documents which merely mention the general use of image processing or generation without detailing of the underlying details of such, are classified in the application place. Where the essential technical characteristics of an invention relate both to the image processing or generation and to its particular use or special adaptation, classification is made in both G06T and the application place.

Limiting references

Delete: The entire existing Limiting references section/table.

Limiting references

This place does not cover:

Photogrammetry or videogrammetry	G01C 11/00
Computer-aided design	G06F 17/50
Reading or recognising printed or written characters or recognizing patterns, e.g. fingerprints, which is covered by subclass	G06K
Modification of image data to allow display using multiple viewports	G09G
Circuits for generating functions for visual indicators	G09G
Arrangements or circuits for control of indicating devices	G09G
Scanning of documents or the like in pictorial communication	H04N

G06T7/00

Definition statement

Delete: All of the existing bulleted statements in the Definition statement section.

Insert: The following replacement bulleted statements.

- Analysis of motion, i.e. determining motion of an image subject, or of the camera having acquired the images; Tracking; Change detection; e.g. by block matching, feature-based methods, gradient-based methods, hierarchical or stochastic approaches, motion estimation from a sequence of stereo images.
- Analysis of texture, i.e. analysis of colour or intensity features which represent a perceived image texture, e.g. based on statistical or structural descriptions.
- Analysis of geometric attributes, e.g. area, perimeter, diameter, volume, convexity, concavity, centre of gravity, moments or symmetry.
- Analysis of captured images to determine intrinsic or extrinsic camera parameters, i.e. camera calibration; Calibration of stereo cameras, e.g. determining the transformation between left and right camera coordinate systems.
- Computational analysis of images to determine information, e.g. parameters or characteristics, therefrom.
- Inspection-detection on images, e.g. flaw detection; Industrial image inspection using e.g. a design-rule based approach or an image reference. Industrial image inspection checking presence / absence; Biomedical image inspection.
- Segmentation, i.e. partitioning an image into regions, or edge detection, i.e. detection of edge features in an image, e.g. involving probabilistic or graph-based approaches, deformable models, morphological operators, transform domain-based approaches or the use of more than two images.
- Motion-based segmentation.
- Determination of transform parameters for the alignment of images, i.e. image registration, e.g. by correlation-, feature- or transform domain-based or statistical approaches.
- Depth or shape recovery, i.e. determination of scene depth parameters by consideration of image characteristics; Depth or shape recovery

from shading, specularities, texture, perspective effects, e.g. vanishing points, or line drawings; Depth or shape recovery from multiple images involving amongst others contours, focus, motion, multiple light sources, photometric stereo or stereo images.
- Determining the position or orientation of objects, e.g. by feature- or transform domain-based or statistical approaches.
- Determination of image colour characteristics.

Relationships with other classification places

Delete: The existing paragraph in Relationships with other classification places.

Insert: The following replacement paragraph.

G06T7/00 covers the details of image analysis algorithms, insofar as it deals with the related image processing algorithms per se. Documents which merely mention the general use of image analysis, without details of the underlying image analysis algorithms, are classified in the application place. Where the image analysis is functionally linked and restricted to specific image acquisition or display hardware or processes, it is classified in the application place; otherwise, it is classified in G06T7/00. Where the essential technical characteristics relate both to the image analysis detail *and* to its particular use or special adaptation, classification is made in both G06T7/00 and the application place.

Insert: The following new Application-oriented references section.

Application-oriented references

Examples of places where the subject matter of this place is covered when

specially adapted, used for a particular purpose, or incorporated in a larger

system:

Computerised tomographs	A61B6/03

Signal processing for Nuclear Magnetic Resonance (NMR) imaging systems	G01R33/54
Methods or arrangements for reading or recognising printed or written characters or for recognising patterns, e.g. scene recognition, handwriting recognition, optical character recognition, document recognition, face recognition, biometric identification	G06K9/00
Scanning, transmission or reproduction of documents or the like	H04N1/00
Transforming light or analogous information into electric information using solid-state image sensors	H04N5/335
Stereoscopic television systems	H04N13/00
Methods of arrangements for coding, decoding, compressing or decompressing digital video signals	H04N19/00

Insert: The following new Informative references section.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Processor architectures; Processor configuration, e.g. pipelining	G06T1/20
Processing seismic data	G01V1/28
Bioinformatics	G06F19/10
Medical informatics	G06F19/30
Image Acquisition	G06T1/0007

Delete: The entire <u>existing</u> Limiting references section.

Limiting references

This group does not cover

Processing seismic data	G01V1/28
Bioinformatics	G06F19/10
Medical informatics	G06F19/30

Special rules of classification

Delete: In the <u>existing</u> <u>first</u> paragraph in the Special Rules section the following text:

        This group

Insert: The following symbol (replacement text) for "This group".

        G06T7/00

Insert: The following text as the **new FIRST** paragraph in Special Rules.

        Where the essential technical characteristics of the invention relate both to the image analysis detail and to its particular use or special adaptation, classification is made in both G06T7/00 and the relevant application place in other subclasses.

Delete: The following <u>two</u> <u>existing</u> paragraphs from the Special Rules section.

        Whenever possible, additional information should be classified using one or more of the Indexing Codes from the ranges of G06T2200/00(see FCR document re. G06T) or G06T2207/00.

        If a document contains considerable contribution within the scope of another group, the document should be considered for classification in this group. In particular, the groups mentioned under "Informative References" in G06T 7/00 or one of its subgroups should be considered.

Insert: The following <u>replacement</u> paragraph for the two deleted paragraphs

Additional information should be classified using one or more of the Indexing Codes from the ranges of G06T2200/00 or G06T2207/00. Their use is obligatory.

Delete: In the Special rules section, in the <u>last</u> paragraph which has <u>two</u> bulleted statements, the following text.

*In the **<u>first</u>** bulleted statement, <u>delete</u> this text*:

see G06T 1/20 for processor architectures

<u>Replace</u> the deleted text with the following:

if not provided for elsewhere

*In the **<u>second</u>** bulleted statement, <u>insert</u> at the beginning of the statement <u>before</u> "MPEG7" the following text*:

Extraction of

Glossary of terms

Delete: The <u>first</u> row in the Glossary of Terms section.

CAD	Computer Aided Detection

Delete: The following <u>existing</u> text in the <u>fourth</u> row in the Glossary of Terms section.

Treatment of the images of exactly two cameras in a pairwise manner

Insert: The following <u>replacement</u> text in the <u>fourth</u> row.

Treatment of two images, e.g. from two cameras or a single camera that is displaced, in a pairwise manner

Synonyms and Keywords

Insert: The following <u>two</u> <u>new</u> rows in the Synonyms and Keywords section.

CAD	Computer-Aided Detection
SLAM	Simultaneous Localization and Mapping

G06T7/20

Definition statement

Insert: The following <u>new</u> text as the **<u>first</u>** bulleted statement in the Definition statement section.

- Image analysis algorithms for determining motion of an image subject, or of the camera having acquired the images. Determination of scene movement and between image frames, e.g. Change detection

Delete: The following <u>two</u> <u>existing</u> bulleted statements in the Definition statement section.

- Change detection

- Sports events analysis, movement of players (add the Indexing Code G06T 2207/30221: Sports; Sports image)

Delete: The text shown below (in parentheses) from the bulleted statement that begins with this text: "Determining camera ego-Motion".

(add the Indexing Code G06T2207/30244 Camera pose)

Delete: The text shown below (in parentheses) from the bulleted statement that begins with this text: "Medical motion analysis, e.g. of the left ventricle of the heart".

(add the Indexing Code G06T2207/30048 Heart; Cardiac)

Delete: The text shown below (in parentheses) from the bulleted statement that begins with this text: "Trajectory representation".

                (add the Indexing Code: G06T2207/30241 Trajectory)

References

Insert: The following new Application-oriented references section/table.

Application-oriented references

Examples of places where the subject matter of this place is covered

when specially adapted, used for a particular purpose, or incorporated in a

larger system:

Gesture recognition	G06K9/00335
Scene recognition	G06K9/00624
Recognising video content	G06K9/00711
Recognising scenes under surveillance	G06K9/00771
Recognising scenes perceived from a vehicle	G06K9/00791
Recognising scenes inside a vehicle	G06K9/00832
Burglar, theft or intruder alarms using cameras and image comparison	G08B13/196

Informative references

Insert: In the <u>existing</u> Informative references section, the following <u>new</u> <u>four</u> rows:

Determination of transform parameters for the alignment of images, i.e. image registration	G06T7/30
Depth or shape recovery from motion	G06T7/579
Determining position or orientation of objects	G06T7/70
Surveillance systems using closed-circuit television systems (CCTV)	H04N7/18

Delete: From the <u>existing</u> Informative references section the following <u>three</u> rows.

Image registration	G06T 7/30
Gesture recognition	G06K 9/00335
Scene recognition	G06K 9/00624

Insert: The following <u>new</u> Special rules section.

Special rules of classification

For camera pose, Indexing Code G06T2207/30244 should be added. For heart, cardiac, Indexing Code G06T2207/30048 should be added. For trajectory details, Indexing Code G06T2207/30241 should be added. For sports video, sports image, Indexing Code G06T2207/30221 should be added.

G06T7/40

Insert: The following <u>new</u> Definition statement section.

Definition statement

This place covers:

Analysis of the spatial arrangement of image colour or intensity characteristics representative of a perceived image texture.

Informative references

Insert: In the <u>existing</u> Informative references section, the following <u>three</u> new rows.

Depth or shape recovery from shading	G06T7/507
Filling a planar surface by adding texture in 2D image generation	G06T11/40
Texture mapping in 3D image rendering	G06T15/04

G06T7/60

Insert: The following <u>new</u> Definitions statement section.

Definition statement

This place covers:

- Analysis of image subjects to determine geometric attributes thereof, e.g. area, centre of mass, perimeter, diameter or volume.
- Ellipse detection

Insert: The following <u>new</u> Application-oriented references section.

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Extraction of image features for pattern recognition by deriving geometrical properties of the whole image	G06K9/52

Informative references

Insert: **After** the word "arrangements" shown in the existing row below, the following word:

characterised

Measuring arrangements by the use of optical means	G01B11/00

Delete: The following <u>existing</u> row from the Informative references section.

Extracting geometrical properties from the whole image as recognition features	G06K9/52

Special rules of classification

Delete: The <u>entire</u> Special rules section.

Special rules of classification

The classification symbol G06T7/60 is allocated to documents concerning: Ellipse detection