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Datasheet for the decision
of 20 July 2012

Case Number: T 1039/08 - 3.4.01

Application Number: 05253006.0

Publication Number: 1598769

IPC: G06K 9/00, G06K 9/62

Language of the proceedings: EN

Title of invention:
Method and apparatus for face description and recognition

Applicants:
Mitsubishi Electric Information Technology Centre
Europe B.V.
MITSUBISHI DENKI KABUSHIKI KAISHA

Opponent:
-

Headword:
-

Relevant legal provisions:
-

Relevant legal provisions (EPC 1973):
EPC Art. 84

Keyword:
"Clarity (no; all requests)"

Decisions cited:
-

Catchword:
-

C8136.D
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Case Number: T 1039/08 - 3.4.01

D E C I S I O N
of the Technical Board of Appeal 3.4.01
of 20 July 2012

Appellant: Mitsubishi Electric Information Technology
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Appellant II: MITSUBISHI DENKI KABUSHIKI KAISH
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                               Tokyo 100—8310   (JP)

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Decision under appeal: **Decision of the Examining Division of the**
                               European Patent Office posted 20 November 2007
                               refusing European patent application
                               No. 05253006.0 pursuant to Article 97(1) EPC
                               1973.

Composition of the Board:

Chairwoman: F. Neumann
Members: H. Wolfrum
                M. J. Vogel

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Summary of Facts and Submissions

I.   European patent application 05 253 006.0 (publication
     No. EP 1 598 769) was refused by a decision of the
     examining division dispatched on 20 November 2007 for
     reason of lack of clarity (Article 84 EPC 1973) of the
     claims of the requests then on file .

II. The applicants lodged an appeal against the decision on
     30 January 2008. The prescribed appeal fee was paid on
     the same day. A statement setting out the grounds of
     appeal was filed on 31 March 2008.

     The appellants requested that the decision be set aside
     and a patent be granted on the basis of a main request or
     four auxiliary requests, all filed with the statement
     setting out the grounds of appeal.

     Furthermore, an auxiliary request for oral proceedings
     was made.

III. On 16 March 2012 the appellants were summoned to oral
     proceedings to take place on 24 July 2012.

     In an annexed communication pursuant to Article 15(1)
     RPBA the Board commented on the issues to be addressed
     during the oral proceedings. In this context, the Board
     pointed inter alia to a variety of clarity problems for
     all of the requests on file.

IV. The appellants did not comment on the Board's
     observations nor did they file any further amendments.
     Instead, the appellants withdrew their request for oral
     proceedings by letter of 9 May 2012.

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V.   Oral proceedings were cancelled by notification of
       18 July 2012.

VI.   Independent claim 1 of the appellant's **main request** reads
       as follows :

       "*1. A method of representing an image by a descriptor,
       the method comprising:*
       extracting a set of component images from the image,
       each component image corresponding to a segment of the
       image;
       transforming the component images into the frequency
       domain;
       deriving feature vectors using the transformed
       component images in the frequency domain; and
       processing the feature vectors to generate a descriptor
       representative of the image, wherein the processing step
       comprises performing a series of discrimination
       transformations,
       characterised in that the series of discrimination
       transformations has at least three stages and wherein
       features extracted from the entire image area are
       combined with features from a central image area in the
       final stage of the series of discrimination transforms."

       Further independent claims 21, 23 and 24 are directed
       respectively to a method of performing face recognition
       or detection or classification comprising comparing a
       descriptor derived using a method according *inter alia* to
       claim 1 with stored descriptors representative of facial
       images, an apparatus adapted to perform a method of any
       preceding claim, and a computer program product for
       performing a method of any preceding claim.

Claims 2 to 20, 22 and 25 are dependent claims.

Claim 1 of the **first auxiliary request** differs from
claim 1 of the main request in that its characterising
clause reads :

"*characterised in that the series of discrimination
transformations has at least three stages, each stage
comprising combining feature vectors and performing
discrimination transformations on the combined feature
vectors to generate further feature vectors, and wherein
a feature vector derived from the entire image area is
combined with a feature vector derived from a central
image area in the final stage of the series of
discrimination transforms.*"

Further independent claims 19, 21 and 22 correspond to
independent claims 21, 23 and 24 of the main request,
respectively.

Claims 2 to 18, 20 and 23 are dependent claims.

The **second auxiliary request** differs from the first
auxiliary request only in that in claim 1 the
"*discrimination transformations*" are concretized to be
"*linear discrimination transformations*".

Claim 1 of the **third auxiliary request** reads :

"*1. A method of representing a face in a facial image by
a descriptor, the method comprising the steps of:*

extracting a set of component images from the image, each component image corresponding to a segment of the image;

transforming the component images into the frequency domain;

deriving feature vectors using the transformed component images in the frequency domain; and

processing the feature vectors to generate a descriptor representative of the image,

characterised in that:

said extracting step comprises extracting a set of component images comprising a whole facial image, the top and bottom halves of the whole facial image, a central facial image, and the top and bottom halves of the central facial image;

said deriving step comprises deriving:

    a first feature vector using the real part of the transformed whole facial image;

    a second feature vector using the imaginary part of the transformed whole facial image,

    a third feature vector using the amplitude components for the transformed top half of the whole facial image; "

    a fourth feature vector using the amplitude components for the transformed bottom half of the whole facial image;

    a fifth feature vector using the real part of the transformed central facial image;

    a sixth feature vector using the imaginary part of the central facial image;

    a seventh feature vector using the amplitude components for the transformed top half of the central facial image; and

an eighth feature vector using the amplitude
components for the transformed bottom half of the
central facial image;
said processing step comprises:
a first stage comprising combining and performing
a discrimination transformation on (i) the first and
second feature vectors to generate a ninth feature
vector; (ii) the third and fourth feature vectors to
generate a tenth feature vector; (iii) the fifth and
sixth feature vectors to generate an eleventh
feature vector and (iv) the seventh and eighth
feature vectors to generate a twelfth feature vector;
a second stage comprising combining and performing
a discrimination transformation on (v) the ninth and
tenth feature vector to generate a thirteenth
feature vector; and (vi) the eleventh and twelfth
feature vector to generate a fourteenth feature
vector; and
a third stage comprises combining and performing a
discrimination transformation on thirteenth and
fourteenth feature vector to generate a fifteenth
feature vector."

Further independent claims 11, 13 and 14 correspond to
independent claims 21, 23 and 24 of the main request,
respectively.

Claims 2 to 10, 12 and 15 are dependent claims.

The **fourth auxiliary request** differs from the third
auxiliary request only in that in claim 1 the
"*discrimination transformations*" are concretized to be
"*linear discrimination transformations*".

VII. The arguments of the appellants, insofar as they are
      relevant for the present decision, are derivable from the
      Reasons for the Decision below.

Reasons for the Decision

1.   The appeal complies with the requirements of Articles 106
      to 108 and Rule 99 EPC and is, therefore, admissible.

2.   Procedural matters

      In view of the withdrawal of the appellants' former
      request for oral proceedings there was no need for the
      Board to hold oral proceedings or to wait with issuing a
      decision until the scheduled date of 24 July 2012.

      Therefore, the Board decided to cancel the said oral
      proceedings and to immediately continue the case in
      writing.

3.   Main request - Article 84 EPC 1973

3.1   The Board shares the examining division's view that the
      terms "discrimination transformation" and "series of
      discrimination transformations" are too general to be
      supported by the description.

      In examination, the appellants argued that the term
      "discrimination transformation" was well known in the art
      and that various types of transformations were known. The
      skilled person would understand the purpose of the
      transformations (page 2, second paragraph of the letter
      dated 22 May 2007).

The Board does not contest this view but considers that
these terms are too vague and indefinite so as to define
in a recognizable manner the measures to be taken for
processing the various feature vectors. In particular, it
is not clear from claim 1 how the desired "descriptor"
would be obtained by means of arbitrary discrimination
transformations executed on unspecified mathematical
entities.

3.2   Moreover, the appellants held that the fact that the
        description stated that "Aspects of the invention are set
        out in the accompanying claims" meant that the claims are
        supported by the description (page 4, third paragraph of
        the statement setting out the grounds of appeal).

        However, this purely formal statement does not qualify as
        a proper description of the claimed subject-matter.

        In fact, the most general presentation of the invention
        is provided by paragraph [0016] of the published
        application. This paragraph, which lists a number of
        aspects of the invention, reads :

        "*[0016] In more detail, certain aspects of the invention
        are:
        1) Use of a multi-stage architecture with three
        transformation stages in the Fourier Domain with the
        Entire and Central Features joined and mapped via D-LDA*
        [dual-space Linear Discriminant Analysis] *projection. (In
        the prior art Joint Fourier Vector and Central Fourier
        Vector are combined without mapping)*

2) New set of component facial images which is simplified compared to AFRD [Advanced Face Recognition Descriptor] *and yields better performance*
3) Used of a better suited linear mapping called dual-space LDA as opposed to PCA-LDA [Principal Component Analysis-LDA] *transform used in the AFRD*
4) Use of different frequency components in the Fourier spectrum. In addition to low-horizontal and low-vertical frequency components used by both the AFRD and the invention, the AFRD is also scanning high-horizontal and low-vertical components, while the proposed invention uses low-horizontal and high-vertical components. As a consequence, the proposed invention is more sensitive to vertical facial features, which have superior inter-personal discriminating power and less sensitive to face localisation errors in horizontal direction."

No indication is provided in the description that the invention may be generalised beyond these specific aspects.

In contrast, the definitions of claim 1 are much more general and, in fact, do not specify any of these aspects. The description therefore does not provide support for a method defined in the general terms of claim 1.

3.3   Finally, claim 1 does not define the complete framework within which the invention would make technical sense nor does it indicate all those features which are essential to the solution of the problem underlying the invention.

According to the appellants, the problem addressed by the present invention was the aim to reduce the amount of processing required for the image processing without

compromising the distinctiveness of the resultant
descriptor (see page 3, penultimate paragraph of the
statement setting out the grounds of appeal).

However, adding further stages to known single-stage or
two-stage processes of discrimination transformations, as
defined in the characterizing clause of present claim 1,
actually increases the computational effort and thus does
not constitute a legitimate solution to the problem posed.
This is all the more true, as the technical effect of
additional stages of discrimination transformations
isolated from other measures (such as for instance the
choice of a specifically suitable transformation
algorithm (*ie* Dual-LDA) remains obscure.

3.4   Although having been informed about the above
        deficiencies by the Board's communication annexed to the
        summons to oral proceedings of 16 March 2012, the
        appellants did not present any comments nor propose any
        amendments.

4.   Auxiliary requests - clarity

        In its communication of 16 March 2012 the Board
        expressed its doubts that claim 1 of each of the first to
        fourth auxiliary requests defined a complete solution to
        the problem posed. In particular, the Board considered it
        unlikely that any number of arbitrary discrimination
        transformations (even if they are linear) could achieve a
        satisfactory solution to the problem of obtaining
        adequate descriptor quality when operating on feature
        vectors derived from a reduced number of Fourier
        transformed image segments. Claim 1 of each of the
        auxiliary requests therefore lacks the essential features
        necessary to solve the problem.

The appellants did not comment on this issue either, and the Board has no reason to discard its objections.

5.   Consequently, none of the appellants' requests on file is allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar   The Chairwoman

R. Schumacher   F. Neumann