

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PETER QUARENDON

Appeal No. 1997-4052
Application 08/479,893¹

ON BRIEF

Before URYNOWICZ, THOMAS and HAIRSTON, Administrative Patent Judges.

URYNOWICZ, Administrative Patent Judge.

Decision on Appeal

This appeal is from the final rejection of claims 21-39, all the claims pending in the application.

The invention pertains to a method and apparatus for generating a model of a 3-D region of an object. Claim 21 is illustrative and reads as follows:

¹ Application for patent filed June 7, 1995. According to appellant, the application is a continuation of Application 08/030,509, filed March 12, 1993, now abandoned.

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Margalit et al. (Margalit), "Using Probabilistic Domain Knowledge to Reduce the Expected Computational Cost of Template Matching", Computer Vision, Graphics and Image Processing, September 1990, v.51, n.3, pp. 219-234.

The appealed claims stand rejected under 35 U.S.C. § 103 as being unpatentable over Miller in view of Liu and Margalit.

The respective positions of the examiner and the appellant with regard to the propriety of these rejections are set forth in the final rejection (Paper No. 17) and the examiner's answer (Paper No. 22), and the appellant's brief (Paper No. 21).

Appellant's Invention

Appellant calculates a first value representing a variation between image data at locations on three different 2-D images of the 3-D region at which each point would appear if the point in the 3-D region were visible in the 2-D image. A second value is calculated from the first value, wherein the second value represents a probability that if each point lay on a visible surface in the 3-D region, the first value would result. Next, a visibility attribute is assigned to each point in the 3-D region in accordance with the second value and visible characteristics of

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the locations on the three different 2-D images. A determination is then made using the visibility attribute of whether each point in the 3-D region is on the surface of the object. Finally, those points identified to be on the surface of the object are used to construct a model of the 3-D region for viewing images of the region from multiple positions.

Opinion

At page 4 of the brief, appellant asserts that claims 21-39 stand or fall together.

Appellant argues that there is no suggestion or motivation for combining the teachings found within Miller, Liu or Margalit to arrive at appellant's invention for using at least three different 2-D images of an object to determine the probability of whether a point lies on the surface of the 3-D object and for using those points identified to be on the surface of the object to build a model of the 3-D object.

With respect to this issue, at page 9 of the answer the examiner asserts that Margalit teaches applying its probability teachings to

the problem of image registration, that Liu shows image registration processes in Figures 1 and 2 and that Miller teaches the need for mapping, i.e. registering onto a 3-D model. The position is taken that one of ordinary skill in the art would have combined Liu and Margalit to improve Liu's registration and combined those teachings with Miller to apply texture to the model created by Liu.

We will not sustain the rejection of claims 21-39. It is considered that the examiner has not established the requisite motivation for combining the references. There is no evidence or rationale provided by the examiner establishing that combining Margalit with Liu would have improved Liu's registration as asserted. Furthermore, Liu is concerned with object recognition using multiple 2-D camera views. 3-D object recognition is accomplished by matching sequentially input 2-D silhouette shape features against those of model shapes taken from a set of fixed camera views. The examiner's answer does not draw attention to any specific disclosure in Liu in support of the conclusion that Liu is concerned with building a model of a 3-D region for viewing images of the region from multiple positions and no such disclosure is

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apparent. At page 177, Liu discloses that "The process is simple and efficient, involving no complicated 3D surface data computation and 3D object representation." Accordingly, no merit is seen in the position that one of ordinary skill in the art would have combined Miller to the model created by Liu, because Liu is concerned with recognizing a model, not creating a model.

Appellant further argues to the effect that even assuming there were motivation to combine the teachings of Miller, Liu and Margalit, the combination would not meet the claimed invention. We agree. As urged by appellant, there is simply no showing that any of the references teaches using a visibility attribute from multiple 2-D images to determine whether points are on the surface of an object

and then using those points determined to be on the surface of the object to generate a model of the object.

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REVERSED

STANLEY M. URYNOWICZ, JR.)
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) BOARD OF PATENT
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Administrative Patent Judge)
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