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I. BACKGROUND

Plaintiff brings suit alleging infringement of United States Patent Nos. 6,717,518 (“the ’518 patent”), 6,959,293 (“the ’293 patent”), 7,650,015 (“the ’015 patent”), 8,805,001 (“the ’001 patent”), 8,983,134 (“the ’134 patent”), and 8,989,445 (“the ’445 patent”) (collectively the “patents-in-suit”) by the Defendant.

The ’015, ’001, ’134, and ’445 patents are related and share the specification, and are generally referred to collectively as “the ’015 patent family.” In particular, the ’001 patent is a continuation of the application leading to the ’015 patent, the ’134 patent is a continuation of the application leading to the ’001 patent, and the ’445 patent is a continuation of a continuation of the application leading to the ’001 patent. Each of the patents in the ’015 patent family is entitled “Image Processing Method.” The application leading to the ’015 patent was filed on February 20, 2007, is based on a series of earlier U.S. patent applications with an earliest priority date of September 13, 1999, which itself claims priority to an earlier filed PCT application filed on July 22, 1997, which itself claims priority to a French application filed on July 26, 1996. The ’015 patent issued on January 19, 2010. The application leading to the ’001 patent was filed on November 17, 2009 and issued on August 12, 2014. The application leading to the ’134 patent was filed on March 17, 2014 and issued on March 17, 2015. The application leading to the ’445 patent was filed on August 13, 2014 and issued on March 24, 2015. In general, the ’015 patent family is directed to an image processing method and apparatus for face and/or object detecting and tracking using histograms of the image. The Abstract of the ’015 patent states:

A method and apparatus for localizing an area in relative movement and for determining the speed and direction thereof in real time is disclosed. Each pixel of an image is smoothed using its own time constant. A binary value corresponding to the existence of a significant variation in the amplitude of the smoothed pixel from the prior frame, and the amplitude of the variation, are determined, and the time

constant for the pixel is updated. For each particular pixel, two matrices are formed that include a subset of the pixels spatially related to the particular pixel. The first matrix contains the binary values of the subset of pixels. The second matrix contains the amplitude of the variation of the subset of pixels. In the first matrix, it is determined whether the pixels along an oriented direction relative to the particular pixel have binary values representative of significant variation, and, for such pixels, it is determined in the second matrix whether the amplitude of these pixels varies in a known manner indicating movement in the oriented direction. In each of several domains, histogram of the values in the first and second matrices falling in such domain is formed. Using the histograms, it is determined whether there is an area having the characteristics of the particular domain. The domains include luminance, hue, saturation, speed (V), oriented direction (D1), time constant (CO), first axis (x(m)), and second axis (y(m)).

Asserted claim 6 of the '015 patent is shown below:

A process of tracking a target in an input signal implemented using a system comprising an image processing system, the input signal comprising a succession of frames, each frame comprising a succession of pixels, the target comprising pixels in one or more of a plurality of classes in one or more of a plurality of domains, the process performed by said system comprising, on a frame-by-frame basis: forming at least one histogram of the pixels in the one or more of a plurality of classes in the one or more of a plurality of domains, said at least one histogram referring to classes defining said target, identifying the target from said at least one histogram, drawing a tracking box around the target, and centering the tracking box relative to an optical axis of the frame.

The application leading to the '293 patent was filed on February 23, 2001, claims priority to a French patent application filed on February 24, 2000, and issued on October 25, 2005. The '293 patent is entitled "Method and Device for Automatic Visual Perception." In general, the '293 patent is directed to detecting/analyzing an event by the formation of a histogram. The Abstract of the '293 patent states:

A visual perception processor comprises histogram calculation units, which receive the data DATA(A), DATA(B), . . . DATA(E) via a single data bus and supplying classification information to a single time coincidences bus. In a preferred embodiment the histogram calculation units are organized into a matrix.

Claim 1 of the '293 patent is shown below:

A visual perception processor for automatically detecting an event occurring in a multidimensional space (i, j) evolving over time with respect to at least one digitized parameter in the form of a digital signal on a data bus, said digital signal being in the form of a succession a_{ijT} of binary numbers associated with synchronization signals enabling to define a given instant (T) of the multidimensional space and the position (i, j) in this space, the visual perception processor comprising:

the data bus;

a control unit

a time coincidences bus carrying at least a time coincidence signal; and

at least two histogram calculation units for the treatment of the at least one parameter,

the histogram calculation units being configured to form a histogram representative of the parameter as a function of a validation signal and to determine by classification a binary classification signal resulting from a comparison of the parameter and a selection criterion C, wherein the classification signal is sent to the time coincidences bus, and wherein the validation signal is produced from time coincidences signals from the time coincidence bus so that the calculation of the histogram depends on the classification signals carried by the time coincidence bus.

The application leading to the '518 patent was filed on February 9, 2001, is based on an earlier filed PCT application filed on January 15, 1999, which itself claims priority to a French application filed on January 15, 1998. The '518 patent issued on April 6, 2004. The '518 patent is entitled "Method and Device for Automatic Visual Perception." In general, the '518 patent is directed to detecting the drowsiness of a person based on analyzing the person's face. The Abstract of the '518 patent states:

In a process of detecting a person falling asleep, an image of the face of the person is acquired. Pixels of the image having characteristics corresponding to an eye of the person are selected and a histogram is formed of the selected pixels. The histogram is analyzed over time to identify each opening and closing of the eye, and characteristics indicative of the person falling asleep are determined. A sub-area of the image including the eye may be determined by identifying the head or a facial characteristic of the person, and then identifying the sub-area using an anthropomorphic model. To determine openings and closings of the eyes, histograms of shadowed pixels of the eye are analyzed to determine the width and

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