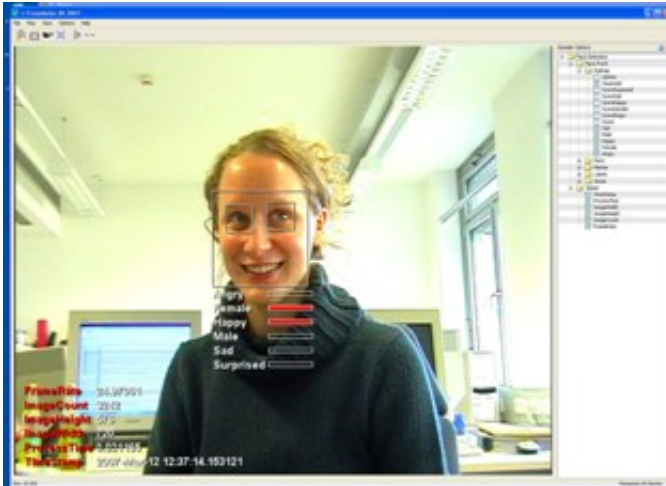# Happy, sad, angry or astonished?

July 3 2007

A new image analysis software can immediately identify whether the person in the image is male or female and what kind of mood they are in. © Fraunhofer IIS

How do people respond when they walk past an advertising poster? Do they stop and turn around to look at it with interest or march angrily past? A new system of detailed facial analysis can recognize a person's mood in an instant.

An advertisement for a new perfume is hanging in the departure lounge of an airport. Thousands of people walk past it every day. Some stop and stare in astonishment, others walk by, clearly amused. And then there are those who seem puzzled when they look at the poster.

With the help of a small video camera, the system automatically localizes the faces of everyone who walks past the advertisement. And nothing escapes its watchful eye: Does the passerby look happy, surprised, sad or even angry?

The system for rapid facial analysis is being developed by researchers at the Fraunhofer Institute for Integrated Circuits IIS in Erlangen. Highly complex algorithms immediately localize human faces in the image, differentiate between men and women and analyze their expressions.

"The special feature of our facial analysis software is that it operates in real time," says Dr. Christian Küblbeck, project manager at the IIS. "What's more, it is able to localize and analyze a large number of faces simultaneously." The most important facial characteristics used by the system are the contours of the face, the eyes, the eyebrows and the nose. First of all, the system has to go through a training phase in which it is presented with huge quantities of data containing images of faces. In normal operation, the computer compares 30,000 facial characteristics with the information that it has previously learned.

"On a standard PC, the calculations are carried out so quickly that mood changes can be tracked live," explains Küblbeck. However, we do not need to worry about an invasion of our privacy, as the software analyzes the data on a purely statistical basis.

The software package is not only of interest to advertising psychologists; there are numerous potential applications for the system. It can be used, for example, to test the user-friendliness of computer software programs. The system monitors the facial expressions of the user in order to determine which aspects of the program arouse a particularly strong reaction. Alternatively, it can assess the reactions of the users of learning software, in order to establish the extent to which they are put under stress or challenged by the task they are performing. The system

could also be used to check the levels of concentration of car drivers.

A demonstration version of the face detection and analysis software package is available for download at: www.iis.fraunhofer.de/EN/bf/bv … kognitiv/biom/dd.jsp

Source: Fraunhofer-Gesellschaft

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