

Computers estimate emotions



Image: This computer user is clearly not about to throw a fit. Several of the user's physiological parameters are measured by sensors in the glove. © Fraunhofer IGD

Many computers are already able to see and hear. However, they have no way of telling whether their users are happy or angry. At CeBIT 2006, researchers will be presenting techniques that could one day enable the digital servant to respond to the mood of its human master.

Several recent studies have found that computer users not only love and cherish their machines, but very often maltreat them. Experts have identified aggression towards the PC as a genuine problem that deserves greater attention in the academic field. The kicks and blows of frustrated users cause computer damage that cannot be dismissed as negligible, neither in terms of personal property nor on a commercial and economic level. If only for this reason, it would be good for computers to assess their users' emotions correctly and respond accordingly.

This area of research into human-computer interaction becomes seriously relevant when it comes to developing software and hardware. Vehicle designers have known for a long time that drivers and pilots feel better and make fewer errors if they are sitting comfortably and can find the controls where they expect them to be. They are much more relaxed when they reach their destination, and may even look forward to their next trip. Why should matters be any different for well-tempered computer users?

The first question asked by scientists at the Fraunhofer Institute for Computer Graphics Research IGD in Rostock was: How can the computer possibly find out anything about its human operator's frame of mind? Emotions are given away by peripheral physiological processes. Some of these, such as posture, fidgeting or frowning, are easy to detect and can be observed and classified by a camera with image analysis software. Heartbeat and breathing rate, blood pressure, skin temperature and electrical resistance of the skin, on the other hand, are rather more subtle factors.

"We have developed a glove that has sensors for measuring parameters like these," says Christian Peter, engineer at the department for Human-Centered Interaction Technologies. "It is connected to a device that evaluates and saves the data. We are also working on techniques that will enable computers to interpret facial expressions and extract emotional elements from voice signals."

Interpreting all the data is difficult too, since emotions are by their very nature ambiguous, transient and hard to describe. The method can only work if the user trains the computer in advance – but the IGD researchers have succeeded in doing even this. Visitors of CeBIT can find out how in Hall 9. The world's biggest computer exhibition will be held in Hanover on March 9 to 15, 2006.

Source: Fraunhofer-Gesellschaft

This document is subject to copyright. Apart from any fair dealing for the purpose of private study, research, no part may be reproduced without the written permission. The content is provided for information purposes only.