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Getting emotional

Philips Design has been exploring emotional sensing for the past decade, paving the way for a world that focuses on relaxed, human interactions

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A nifty machine is flawed if it does not connect in some meaningful way with the human that uses it. This may seem obvious, yet we still find ourselves in a world of infinitely powerful gadgets that push us further from knowing ourselves. Since the late 1990s Philips Design has been researching what makes us stressed, happy, focused, and how to use our minds to help our bodies behave in the way we would like. Today, the market is beginning to prick up its ears and listen.

Back in touch
Biometric sensing has existed for decades. Electrocardiograms and lie detectors, for example, use varieties of biometric technology to interpret a person's physiological and even psychological state. But for many years, that technology has been confined to professional environments like laboratories or hospitals. Ordinary consumers, meanwhile, have had little access to devices that can tell them more about their emotions.

Instead, people have filled their homes with impersonal gadgets. “We are given cell phones with a processing power to navigate to the moon, but the sensitivity of a frozen chicken,” says Clive van Heerden, Senior Director at Philips Design. “So much of our ability to learn, to love, to feel is based on our emotional responses. But as the world becomes less tangible, we begin to lose some of those experiences.”

A decade ago Clive was involved in researching how to help people get back in touch with themselves. Just before joining Philips Design from Philips Research in 1998, Clive and his team had worked with MIT Laboratory on a glove that sensed changes in one’s emotional state. Using a galvanic skin response, or GSR sensor, the glove could detect when the wearer was suddenly aroused, but could not distinguish its positive or negative swing, known as valence.

Despite the initial drawbacks, the team continued exploring ways to apply existing sensing technology. “We were keen to develop something to enable an athlete to train their focus - and help them get in the zone,” he explains. Together with the cellphone company Orange and Media Lab

Dublin, the European research partner of MIT Media Lab, they produced a wireless game called Relax to Win.

To play, the user slid the device between their fingers and tried to calm down. Their emotional responses were measured through GSR technology, which affected the movement of a dragon character on the PC or cellphone screen. The more relaxed the player, the faster the dragon flew. “It's the first true emotional sensor application I'm aware of,” Clive says. Although the game never reached the market, the quest continued.

Wear your heart on your sleeve
A key element to Clive's research at Philips Design has been integrating biometric sensors into textiles and apparel. As part of the Design Probes program, which explores ideas that could be 10 or more years from market-ready, he created a conceptual range of emotionally sensitive wearables. Part of the idea was to challenge conventional ways of thinking, by combining technically sophisticated electronics with traditionally unresponsive objects, like clothes and jewelry.

The SKIN Probes in particular attracted a great deal of attention. Philips Design developed two dresses using soft technology—sensors embedded in the textiles—to affect their pattern and color. The Probes team also explored youth culture, particularly tattoos and body adornment. “I thought, if people are willing to put ball bearings under their skin, where will this lead?”

In fact, it lead to thinking about tattoos that react to another person's touch, like that of a lover. Together with renowned tattoo artist Henk Schiffmacher and DJ Scanner, the team created a conceptual video showing how constantly-moving patterns could grow and change over a person's body as they are caressed. Though the notion seems far-fetched, Clive explains that the technology to embed bio-compatible, sub-cutaneous displays using digital ink is theoretically possible.

Probing the future
While the Philips Design Probes team researched possible far-future scenarios, other teams at Philips Design are working on applying sensing technology in the nearer term. One recent project explored simple relaxation techniques, taking Chinese meditation balls as its inspiration. The result was MindSpheres. By orbiting two wooden balls in the palm of your hand in a fluid way, embedded LEDs light up in an increasingly regular pattern. By reacting to the user's movement, MindSpheres teaches them to slow down and focus on the here and now. “Stress is a problem for many people, so our aim is to help people recognize it and learn how to relax,” explains Luc Geurts , Director of Research and Development.

Stress awareness was also of paramount importance in Philips Design's most recent project, the Rationalizer. Developed with the Dutch bank ABN AMRO, it is an emotion sensing system targeted at home investors who trade online. The aim is to show when they are positively or negatively stressed - either scared or greedy—which in turn encourages them to take time out, calm down and review the situation.

Technical elements to the Rationalizer have been deliberately downplayed. A bracelet measures the user's emotions using a GSR sensor, which are then translated as a dynamic light pattern on either the bracelet or the system's second component, a bowl- a domestic object that everyone can relate to. “Best of all, the problem of valence in the GSR sensor is not an issue in this instance,” explains Geert Christiaansen, Director of Business Development at Philips Design. “Because for decision making, it doesn't matter if your emotion is positive or negative. Both are bad for trading - you need to be calm and rational.” The Rationalizer is currently being tested by 300 users at Amsterdam's VU University.

In the meantime, Philips continues exploring emotion sensing. “It's really become part of the innovation language,” Clive enthuses. As such, he believes that the possibilities in this field are almost endless. Interpreting social situations using intelligent cameras, or finding new controllers for gaming technology are possibilities. “Or how about dating sites where you can tell if someone is attracted to you?” he adds.

While the 'killer application' in this field may still be some way off, according to Clive, he is convinced that one element is essential. “For me, it's important to use technology in a non-invasive way. I think the more you can sense remotely, the more it will be picked up by people.” And as always with Philips Design, the more human the experience, the better.