

# Brainy Stuff

Australia's Emotiv wants players to control games with their minds.

By Brad Howarth

In the 1980 film *The Empire Strikes Back*, Jedi master Yoda uses the mysterious Force to lift Luke Skywalker's star fighter from a swamp by simply thinking about it. But when it comes to playing *Star Wars* computer games, gamers have to use a clumsier method to move the ship: pushing buttons on a control pad.

San Francisco-based Emotiv wants to give gamers Yoda-like powers. The startup, founded in 2003, is developing a technology that monitors a user's brain activity and interprets it to manipulate a game environment, such as lifting an object and spinning it around.

Users wear a headset which monitors electrical signals from the brain, Emotiv's signal processing technology then monitors and interprets emotional responses, such as excitement or happiness. "The next generation of communication between man and machine will not just be limited to conscious communication," says Emotiv CEO Nam Do.

Emotiv plans to release a \$250 headset for monitoring brain activity as soon as 2008 that would work with both game consoles and PCs. The technology behind Emotiv is the brainchild of Australian National University neuroscientist Allan Snyder, based on his research into non-conscious mental processing—the type of automatic thinking that enables us to keep our footing while running along an uneven pathway, for example.

Three software products are currently in

development, each using signal processing technology. The first, Expressiv, interprets facial expressions in real time using brain activity readings from the headset. If the player smiles, the headset can interpret and mimic this action, so an on-screen avatar in the game also smiles. The second product, Intuitiv, determines a person's emotional state, such as whether he is happy, sad, excited, or bored. The third product, Cognitiv, enables a person to train himself to perform an action in a game by thinking about it; that might mean manipulating an onscreen object, or activating a character's special abilities.

Emotiv is currently demonstrating all three products to game developers and others involved in the consumer entertainment industry. Anne-Marie Roussel, director of the strategic and emerging business group at Microsoft, believes Emotiv has the potential to be at the forefront of future technologies that interface people with machines.

"While there may be some initial emotional barriers on the part of consumers to adopt brainwave-oriented technologies, such advances are exciting," Ms. Roussel says. No formal agreement has yet been signed between the two organizations.

The potential market is anyone who owns a game console—that's 70 million in the United States alone, and untold legions of gamers worldwide.

Emotiv will also work with game developers to have its control interface incor-

porated into games. The technology can work with most games, Mr Do says, but better results are achieved if the product is designed with the Emotiv technology in mind. The company won't reveal which developers it is working with.

The company was formed in December 2003 by Mr. Snyder, along with Mr. Do and Tan Le, who had previously co-founded Australian SMS gateway company SASme. A fourth founder, fellow Australian Neil Weste, was one of the entrepreneurs behind the wireless chip developer Radiata, which was purchased by Cisco Systems for US\$295 million in November 2000.

Emotiv migrated its headquarters from Sydney to San Francisco in late 2005, although it maintains a 20-person research and development team in Sydney. The company has raised \$4.3 million in one round from Technology Venture Partners and Epicure Capital Partners. Mr. Do says Emotiv is about to start its next funding round, but declines to say how much the company is raising.

Emotiv is not alone in developing technology to derive commands from brain signals, but other efforts, including those at St. Louis, Missouri's Washington University and MIT Media Lab in Cambridge, Massachusetts, have so far focused on working with the disabled.

If all goes according to plan, it may not be long before people all over the world will be practicing their own Jedi mind tricks.

