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Robot In Touch with Its Emotions
By Tracy Staedter, Discovery News

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Sept. 2, 2005— The ability to express feelings is difficult enough for humans, but now a humanoid robot named Kansei is able to frown or smile according to a flow of artificial consciousness.

Kansei's ability to communicate feelings makes it one step closer to recognizing when humans are happy or sad, an important characteristic for machines expected to one day help care for the elderly, clean house, or greet people at a reception desk.

Watch as Kansei smile and frown.

Kansei, which means "sensibility" and "emotion" in Japanese, also contains speech recognition software, a speaker to vocalize, and motors that contort artificial skin on its face into expressions. The robot could even one day learn to distinguish and articulate whether foods taste good or bad.
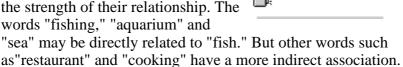
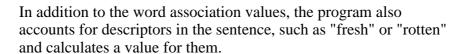"If we establish the mechanism, the robot could find nice food in a

market and even research new delicious foods for humankind," said the Kansei project leader Junichi Takeno, a professor at the Robot and Science Institute of Meiji University in Japan.

To give Kansei an artificial consciousness, Takeno and his team built a software program that extracts word associations from a database of 430,000 words. The word database was built from sentences gleaned from the Internet, a type of large-scale, convenient and constantly updated database in itself.

Kansei Frowns

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The software program then assigns values to the world associations, calculates the values, and then prompts the robot to express whether something is pleasant or unpleasant based on the value.

For example, when Kansei hears the word "fish," it refers to the database to analyze the associated words and the strength of their relationship. The words "fishing," "aquarium" and

Watch Kansei's range of emotions.

"sea" may be directly related to "fish." But other words such as"restaurant" and "cooking" have a more indirect association.

In addition to the word association values, the program also accounts for descriptors in the sentence, such as "fresh" or "rotten" and calculates a value for them.

As with humans, the word "fish" may elicit different, simultaneous memories and reactions, both positive and negative. The same is true with Kansei.

Its program will produce both negative and positive values. But after everything is calculated, if the negative values are greater than the positive, Kansei will frown. If the positive values are greater, Kansei will smile.

In the case of "fish," Kansei says "Fish is fresh" and smiles.

"Kansei is a comprehensive concept useful for the design of human interface. It includes sensibility, sensitivity, feeling and emotion," said Shigeki Sugano, professor of mechanical engineering at Waseda University in Tokyo and an expert in humanoid robots.

Takeno and his team are currently investigating ways to make Kansei's expressions unique from other similar robots that might also use the Internet database for it flow of artificial conscious.

One way is to restrict the robot from searching the database in the same way as the other robot or to make the robots extract data at

random intervals.

So not only will the robots be able to express their feelings, they will also begin to exhibit personal taste.

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