

# Crouching Tiger, Hidden Robot

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IFOMIND Credit: SGAI

Will robots one day rule the world? For decades this notion has both fascinated and terrified humans, our hungry imagination fed by Hollywood blockbusters and sci-fi novels. Now a new generation of robots promises a breakthrough in the world of Artificial Intelligence as they become capable of cognitive thought processes.

The 2005 Fourth British Computer Society's Annual Prize for Progress towards Machine Intelligence sponsored by Electrolux has been won by IFOMIND, a mobile robot system that demonstrates intelligence as it meets a new object in its world. Based on Khepera, a robot commercially available from K-Team, the machine intelligence system was designed and programmed by a team led by Professor David Bell from Queens University, Belfast.



IFOMIND Credit: Dr Chris Needham

IFOMIND reacts initially in an 'instinctive' way to its first perception of an unknown object that it encounters; at first it is generally fearful. However, because the robot is equipped with a human-like capability of inquisitiveness, it realises that it can react in another way and does not have to be scared of something that may not be harmful to it.

So, the robot observes the object from a distance and takes note of how it behaves and how it reacts to different approaches; the robot is then able to decide on the best approach or whether to avoid it. This

knowledge can then be retained by the robot as it carries on and meets many more objects.

This is a leap forward in the domain of Machine Intelligence as IFOMIND is able to use logical thought processes in order to decide the best way to interact with the objects that it meets. David Bell from the IFOMIND team explains, "A system that can observe events in an unknown scenario, learn and participate as a child would is a major challenge in AI. We have not achieved this, but we think we've made a small advance."

David likens the reaction of the robot to the reaction of the tiger in an ancient Chinese folk story from the Tang Dynasty. In the story, the tiger encounters an animal it has never seen before (in this case a donkey). To start with the tiger is wary even rather frightened - of this larger, noisy 'object'.

But its hunger and pride (equivalent to the robots pre-programmed instinct for curiosity) is even greater than the instinct to run away. So the tiger waits, watches and teases the donkey, and finally concludes it is no threat and attacks. In the robot's case it waits and watches to see if can get some new information.

Runners up include Rollo Carpenter's entry -- a chatty personality, George, who can be found at [www.jabberwacky.com](http://www.jabberwacky.com) . Rollo explains, "George learns from every word everyone says to him - to imitate people, as well as trying to be himself. Years of chatting online mean that he can talk about just about anything and even talk many languages. He won the Loebner Prize in 2005 as the 'most human chat program'" Rollo goes on to add that he believes the future of George holds many exciting prospects, such as "your toaster embarking on a comic debate on the nature of toast, or your fridge imitating the way that your partner asks for a beer!" He concludes that "household appliances with character

could soon become companions that are regarded as part of the family."

The award is sponsored by Electrolux, a leader in the field of home appliance machine intelligence, with appliances such as the Electrolux Trilobite 2.0 - a robotic vacuum cleaner. This miniature robot glides around the floor, cleaning as it goes and using ultrasound technology to navigate, with a built-in stair sensor, before taking itself back to its home to recharge.

Their latest innovation is a talking washing machine, the Zanussi-Electrolux ZWV1651. This chatty appliance demonstrates its high degree of perception as it guides its user through the entire washing process.

Sales of domestic appliance robots reached 39,000 units in 2003 and are forecast to hit 20 million by 2008. Robots may soon no longer be confined to the realms of science fiction; they could soon be doing the housework and feeding the cat, making the day of the android sooner than we first thought.

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