Rat's whiskers inspire robot advance

Scratchbot relies on whisker-like to sensors to help navigate, and could have uses in fire rescues and vacuuming

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A robotic rat that can scurry through the dark using its plastic whiskers to navigate could be used to help rescue people from burning buildings, scientists said today.

The device, known as Scratchbot, can track objects using whisker-like sensors andhas been labelled by its creators as a "significant milestone" in the development of animal-inspired artificial intelligence.

The inventors at the Bristol Robotics Lab and University of Sheffield said robots that use feelers rather than vision were much more effective in the dark and in smoke-filled environments.

The Scratchbot – the name derives from spatial cognition and representation through active touch – mimics the "sweeping motion" of a real rodent's whiskers to determine the size and shape of objects in front of it. The technology has the potential for use underground, in the sea, or in vacuum cleaners "to sense textures for optimal cleaning", the researchers said.

A team of international scientists will see the robot in action tonight at the University of Sheffield.

Tony Pipe, of the Bristol Robotics Lab, said: "Active touch sensing is a key focus for those of us looking at biological systems which have implications for robotics research. Sensory systems such as rats' whiskers have some particular advantages ... in humans, for example, sensors are at the fingertips, [so] they are more vulnerable to damage and injury than whiskers.

"Rats have the ability to operate with damaged whiskers and in theory broken whiskers on robots could be easily replaced, without affecting the whole robot and its expensive engineering."

He said applications for the technology could include extremely dusty conditions where

visual capability was impaired. "In a smoke-filled room, for example, a robot like this could help with a rescue operation by locating survivors of a fire."

Tony Prescott, a professor at Sheffield University's psychology department, said: "Our project has reached a significant milestone in the development of actively controlled, whisker-like sensors for intelligent machines. Although touch sensors are already employed in robots, the use of touch as a principal modality has been overlooked until now. By developing these biomimetic robots we are not just designing novel touch-sensing devices, but also making a real contribution to understanding the biology of tactile sensing."