

- [Home](#)
- [News](#)
- [Blogs](#)
- [Multimedia](#)
- [Companies](#)
- [Events](#)
- [Newsletters](#)
- [Jobs](#)

You are here: [Electronics Weekly](#) > [News](#) > [Research](#) > [Device R&D](#) > Video: Researchers build rat-like ScratchBot to map environments

[Go to...](#)

Video: Researchers build rat-like ScratchBot to map environments

no comment

steve bush

2009/07/07



Researchers in Sheffield and Bristol have built a robot that uses rat-like whiskers and a rat brain model to explore and map its environment.

Rather than using the whiskers as simple collision probes, the whiskers are moved rapidly ('whisked') to scan the environment, with this movement modified by the surfaces and objects encountered to extract more detail.

"They are moving back and forth at 3Hz, sweeping through an arc of 60 degrees," Professor Tony Prescott from the University of [Sheffield's department of psychology](#) told *Electronics Weekly*. "Rats sweep at 5-20Hz through the same angle."

See also: [The UK Electronics Research Map](#)

The University of Sheffield is working with the Bristol Robotics Lab – a partnership between the [University of the West of England](#) and the [University of Bristol](#).

Sheffield is working on the brain model and control software, with Bristol developing mechanics, electronics, and a hardware neural network.

The outcome is an increasingly sophisticated physical and computer model called ScratchBot, which is a contribution to the pan-European 'ICEA' project which aims to develop biologically-inspired artificial intelligence systems.

At the moment, ScratchBot's intelligent is partly on-board and partly post-activity off-line processing.

"We have got all the various bits for texture and distance-to-object. We are starting to do curvature and shape, and we are working on a model of the hippocampus that will store two-dimensional information."

Prescott's team works to understand natural systems by building models based on known science, then modifying the models until they behave like the natural system.

This isolates a possible mechanism for the natural system, and produces algorithms that can be used to perform practical tasks.

"We tend to build biomimetic systems, then design a reduced version with more numerical algorithms that does the same thing," Prescott explained.

ScratchBot has nine sensing whiskers on each side (rats have 30). Each has a Hall-effect movement-vibration sensor on its base, and they can be swept back and forth in groups of three, by three electric motors on each side.

This sweeping, combined with three degrees of freedom in its neck – pitch, yaw, and elevation – give ScratchBot all the movement it needs to scan all surfaces within reach.

All real-time processing through on-board hardware is planned.

There are many nocturnal, underground, and underwater animals for whom whisking is more important than sight, pointed out Prescott. And eventually, it is hoped that techniques from the research will allow robots to move easily through dusty and dark environments like collapsed buildings.

Can the brain-whisker model with its abstract data be interfaced with conventional computers?

Yes, said Prescott: "The current robot is already a mixture of biomimetic and conventional numeric algorithm computing."

ScratchBot builds on previous **whisker research at Sheffield**.



Leave a reply

<input type="text" value="Name"/>	<input type="text" value="E-mail"/>	<input type="text" value="Website"/>
<input type="text" value="Message"/>		
<input type="button" value="Post a comment"/>		

[Latest Electronics Jobs](#)

- [IC 3E LLP: Applications Engineer - CFD/ CAD/ Ansoft](#)
- [Jam Recruitment: Senior Sales Engineer \(Technical\)](#)
- [IC Resources Ltd: Analog IC Design Engineer / Lead - Paris, France](#)
- [IC Software: DSP Engineer - Algorithms & Implementation](#)
- [Jam Recruitment: FPGA Design Engineer \(FPGA/RTL\)](#)

Follow Us



Archive – Older News

Select Month

Categories

Select Category

Industry Resources

Related content from our Industry Resources



The Raspberry Pi is a credit-card sized computer board that plugs into a TV & a keyboard.
Raspberry Pi



The latest electronics trends from companies within the industry
Industry Resources



The single resource for all your electronics industry needs
Industry Resources

Subscribe to the Magazine



- Recommended

- [Eyes On Android](#)

- [Electro Ramblings](#)
- [Gadget Master](#)
- [Distribution World](#)
- [An Engineer In Wonderland](#)
- [Universities - Electronics Research](#)
- [Led Luminaries](#)
- [Certification & Test](#)
- [Made By Monkeys](#)
- [Toshiba Electronics Education Zone](#)
- [Directive Decoder](#)
- [Raspberry Pi development](#)
- [Chips and Beer](#)
- [Open Source Engineering](#)
- [Noticeboard](#)
- [Technology Startups](#)

- Popular Tags

[adc](#) [analogue](#) [ARM](#) [cdma](#) [developments](#) [charge pump](#) [chips](#)
[communications](#) [electronics](#) [components](#) [controller](#) [dac](#) [design](#) [device](#)
[dsp](#) [EDA](#) [electronic](#) [handheld](#) [test gear](#) [Electronic Power Supplies](#) [Electronic test and](#)
[measurement products](#) [oscilloscope](#) [ethernet](#) [filter](#) [fpga](#) [integrated circuits](#) [IP](#)
[Ido Linear](#) [lithography](#) [materials](#) [microcontroller](#) [microprocessor](#) [Mixed Signal](#) [nanotechnology](#) [os](#)
[oscillator](#) [pattern generators](#) [plasma](#) [power](#) [power analysers](#) [Power Converters](#) [process](#)
[products](#) [PSU Products](#) [R&D](#) [regulator](#) [resistor](#) [RF](#) [rohs](#) [single board computers](#) [sram](#)
[synthesiser](#) [telecoms](#) [vco](#)

- [Electronics Weekly Tweets](#)

- Jam Recruitment: Senior Sales Engineer (Technical): £50000.00 - £60000.00 per annum + Benefits Package: Jam R... <http://t.co/PDBJW8vpiN>, 33 mins ago

- Blog: UK Needs Space Research Minister: 'Mr Woodrow Wyatt, Labour MP for Bosworth, is to ask the Prime Ministe... <http://t.co/Jf9njKDwo8>, 1 hour ago

- IC Resources Ltd: Analog IC Design Engineer / Lead - Paris, France: Salary plus attractive benefits package: ... <http://t.co/eubmBqzn0o>, 1 hour ago

- Blog: Elektra 2013 Product Innovation Award – Readers' Choice: This is your chance to shape... <http://t.co/91qvFQomAU> [#jobs](#) [#electronics](#), 2 hours ago

- IC Software: DSP Engineer - Algorithms & Implementation: £35000 - £55000 per annum: IC Software: Mid to Senio... <http://t.co/il6Uli7vP5>, 2 hours ago

[back to top](#)

[Subscription](#) | [Terms and Conditions](#) | [Disclaimer](#) | [Privacy Policy](#) | [Site Map](#) | [Contact Us](#)

© 2013 Metropolis Media Publishing [Powered By Electronics Weekly](#)