

Shrewbot Finds Its Way Around With Sensitive Whiskers

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Last time we checked in with the Bristol Robotics Lab, in the U.K. (back in 2008), they'd just finished building [Scratchbot](http://www.botjunkie.com/2009/07/02/scratchbot-uses-whiskers-for-search-and-rescue/) (<http://www.botjunkie.com/2009/07/02/scratchbot-uses-whiskers-for-search-and-rescue/>), a whiskery robot inspired by rats. Since then, they've been hard at work bewiskering more robots, including their latest creation: Shrewbot, inspired by the small (but capable) Etruscan shrew.

The Etruscan Pygmy shrew is the smallest mammal on the planet, at just a few centimeters long and weighing under two grams. Despite their diminutive size, they're ravenous little powerhouses, requiring twice their body weight in food per day. To catch all the insects that they need to eat to keep themselves functioning, shrews rely on their exquisitely sensitive whisker arrays to locate munchies in near total darkness, and jealous roboticists have attempted to duplicate the shrew's ability to adapt to environments in which visual systems don't work that well by creating robots that also use whiskers to navigate.

Bristol Robotics Lab's Shrewbot seeks to mimic this method of "active touch" sensing and navigation through an artificial shrew nozz of sorts. Like a shrew, the robot can move its snout around independently of its body, and if any of the artificial whiskers brush up against an object or surface, the bot can instantly home in on that spot. The idea here is that a robot with whiskers can putter around environments that are dark or full of smoke and not worry about getting lost or running into things.

Of course, it's possible to do similar navigating *without* physical distance detectors, but whiskers have the advantages of being very cheap and very reliable, and no matter how fancy your sonar or LIDAR is, it's hard to do better than detecting an obstacle by interacting with it directly through touch. The other advantage of physical interaction (as a shrew would tell you if shrews could talk) is that sensitive whiskers can return much more information than simply where an object is: shrews can also apparently sense things like shape and texture, and while Shrewbot can't quite get that much detail out of its artificial whiskers, they're working on it.

The other part to all this whisker research is that it goes nose-in-hand with other forms of robotic touch, like fingers. And while nobody's suggesting that we re-invent the finger (or the shrew, for that matter), there are certainly a lot of applications where having some whiskers would be preferable to having some fingers. For example, trying to touch something that may not particularly want to be touched: Whiskers are easy to replace. Fingers, not so much.

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