PRESS RELEASE
EMBARGOED UNTIL WEDNESDAY 11 JULY 11.15 CEST/10.15 BST

INSECT NAVIGATION INSPIRES ROBOT DESIGN

Robot technology that mimics the brains of insects could be developed for jobs that do not require sophisticated skills, such as spraying crops or keeping our streets clean. These are ideas emerging from research at the University of Edinburgh.

Professor Barbara Webb has been looking at the complex capabilities of insects and the way they she navigate. "Insects have tiny brains, but they navigate extremely well," she told delegates at the FENS Forum of Neuroscience today (11 July). She and her team start with a computer algorithm they believe could do the job of navigating like, for example, an ant. Then they work out if the neuronal circuits that enable ants to find their way around could be mimicked by a robot. "Because it is difficult to measure neural activity in an insect flying or running around its natural environment, building robot models helps us bridge the gap between brain and behaviour," she said.

One of Professor Webb's robots is a mobile phone on wheels. Using the phone's in-built camera and compass her team can run different control programmes to test it outside in the insect's natural environment to see how closely it mimics their behaviour.

For example, with a panoramic lens, the robot records insect-eye views along a route through a field of vegetation and can use its memory of these views to follow the same route on its next journey. Using the compass and the speed of the wheels, the robot can keep track of the direction and distance it has moved from its home position and use this to go directly home.

By copying insects, it is hoped that robot control can be made cheaper, simpler and more robust, and hence useful for tasks that do not require sophisticated intelligence. For example, a group of insect-like robots could 'scavenge' for rubbish and bring it back to a single location, in the way that ants bring food to their nest, to make street cleaning more efficient. Or a robot could explore a field of crops, dispensing fertiliser or pesticides in a more targeted fashion.

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Symposium: S56 – Shared principles of animal behavior across species
Abstract: Navigation in insects and robots

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The 11th FENS Forum of Neuroscience, the largest basic neuroscience meeting in Europe, organised by FENS and hosted by the German Neuroscience Society will attract more than 7,000 international delegates. The Federation of European Neuroscience Societies (FENS) was founded in 1998. With 43 neuroscience member societies across 33 European countries, FENS as an organisation represents 24,000 European neuroscientists with a mission to advance European neuroscience education and research. https://forum2018.fens.org/