

Research Highlight | [Published: 23 August 2021](#)

SOFT ROBOTICS

## Insect-like robots learn to turn

[Matthew Parker](#) [Nature Electronics](#) **4**, 543 (2021)**12** Accesses | **1** Altmetric | [Metrics](#)[Sci. Robot.](#) **6**, eabe7906 (2021)

Small, soft robots could be useful in a variety of challenging environments, such as disaster areas, but their lack of rigid components means that they have poor agility, and there is often a trade-off between high lateral speed and having the good rotational control needed for making turns. Some insects, such as ants, achieve fast motion and turning simultaneously by varying the friction between their feet and the ground. Liwei Lin, Min Zhang, Junwen Zhong and colleagues have now developed an ant-inspired soft robot that can combine high speed with trajectory control.



Credit: UC Berkeley photo courtesy of Jiaming Liang and Liwei Lin

The researchers — who are based at Tsinghua University, the University of California at Berkeley, the University of Electronic Science and Technology of China, Carnegie Mellon University and the University of Macau — fabricated the main body of the insect-sized robot from a piezoelectric thin film, which provides lateral motion (with a speed up to 28 body lengths per second), and two electrostatic footpads for rotational motion. Applying a d.c. bias to the footpad dynamically varies the amount of frictional force between the pad and the substrate. To illustrate the capabilities of the approach, Lin and colleagues show that a 240 mg untethered robot can carry a 1,660 mg load, and a tethered robot can carry a commercial 180 mg gas sensor through a Lego obstacle course and find a leak.

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