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Captions: Brain-like computer steers rolling robot with 0.25% of the power needed by conventional controllers

robot-follow.mp4

Video: A rolling robot follows Xiaoqiu An, a mechanical engineering PhD student, guided by a target: red piece of cardboard on a steel stick. The inset shows the robot's camera feed. Video credit: Mingze Chen, Nanoengineering and Nanodevice Laboratory, University of Michigan

Video description: A robot, roughly ten inches tall, follows a student holding a tablet-sized piece of red cardboard above the floor at its camera level, suspended on a stick. The student retreats down the hall in a zigzag pattern, always several steps ahead. In the inset, the target moves side to side across the robot's field of view, a red dot in a yellow circle indicating the robot's attention to it. The video runs at triple speed, suggesting the student was walking slowly.

Screenshot: robot-follow.jpg

lever-arm.MP4

Video: The new memristor controller (right) is compared with a standard controller (left) on a drone controller testing rig. The drone rotor must lift the lever arm to a given position after resting on the ground, and then recover that position after the arm is pushed. Video credit: Mingze Chen, Xiaoqiu An and Nihal Sekhon, Nanoengineering and Nanodevice Laboratory, University of Michigan

Video description: In a split screen, the lever arms start out resting on the ground. When the program starts, the small drone rotors near their ends begin to spin. Both tilt upward above the horizontal, then drift down, then come up, in shrinking oscillations until they rest in a roughly horizontal position. In the second trial, a hand enters each frame, pushing the levers down. The levers bob up and down until they rest at the horizontal again. There is no noticeable difference in performance between the conventional and memristor controllers.

Screenshot: lever-arm.jpg