AERIAL ROBOTICS

Drones get a grip*Sci. Robot.* **4**, eaau6637 (2019)

Credit: AAAS

Even drones deserve a break once in a while, and like flying and gliding animals, they can be made to perch on a surface in order to conserve energy between flights. However, existing strategies to achieve drone perching are limited to specific structures such as tree branches or rough walls. Kaiyu Hang and colleagues have now developed a modularized and actuated landing gear framework that is able switch between different modes of perching.

The researchers — who are based at Yale University, Hong Kong University of Science and Technology, KTH Royal Institute of Technology, Örebro University and the University of Hong Kong — augmented a commercial off-the-shelf drone (DJI F450 platform) with a 3D-printed landing gear and contact modules to enable grasping and hooking onto a variety of surfaces

and structures. With the approach, they demonstrate an energy savings, compared to hovering in air, of 41% when their drones are hooked onto an edge and a savings of up to 69% when balancing on a stick.

Although the energy savings reported are promising, it should be noted that the drones were tested in a controlled indoor environment, and testing in a more dynamic setting, such as outdoors, will introduce new challenges to the landing gear framework and control systems. Moreover, for truly autonomous drones, future implementations should include on-board vision and trajectory planning capabilities.

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