

Abstract Submitted
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Hovering of a jellyfish-like flying machine LEIF RISTROPH, STEPHEN CHILDRESS, Courant Institute, New York University — Ornithopters, or flapping-wing aircraft, offer an alternative to helicopters in achieving maneuverability at small scales, although stabilizing such aerial vehicles remains a key challenge. Here, we present a hovering machine that achieves self-righting flight using flapping wings alone, without relying on additional aerodynamic surfaces and without feedback control. We design, construct, and test-fly a prototype that opens and closes four wings, resembling the motions of swimming jellyfish more so than any insect or bird. Lift measurements and high-speed video of free-flight are used to inform an aerodynamic model that explains the stabilization mechanism. These results show the promise of flapping-flight strategies beyond those that directly mimic the wing motions of flying animals.

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