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The Timing in the Control of Insect Flight Instability SONG CHANG, Applied and Engineering Physics, Cornell University, Z. JANE WANG, Mechanical and Aerospace Engineering, Cornell University — Flapping flight of insects is intrinsically unstable. Using 3D dynamic simulation of flapping flight, we analyze the stability of periodic states associated with the limit cycles of the dynamical system. We construct a discrete time-delayed linear controller and examine the controllability condition. The controller's effectiveness depends in a subtle manner on the timing of the sensory measurement combined with the delay time in actuation.

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