



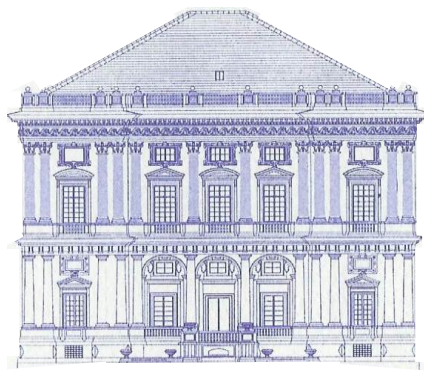
## AVVISO DI SEMINARIO

# “On the application of bio-inspired perching techniques to small UAVs”

Prof. Thomas Bewley

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Department of Mechanical and Aerospace Engineering  
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lunedì 11 aprile, 2011 – ore 14.30  
Facoltà di Ingegneria,  
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## On the application of bio-inspired perching techniques to small UAVs

The surveillance mission of UAVs in urban environments dictates that they should be able to perch, and take off, from a variety of difficult places (on the tops of buildings, poles, electrical wires, on the supports under bridges, in the rafters of roofs, etc.) in order to conserve energy and thereby extend their useful mission. This problem is a very challenging one, and lies at the intersection of unsteady fluid mechanics (in a setting that is very difficult to model accurately) and adaptive control theory. In this preliminary study, we explore the feasibility of bio-inspired wing maneuvers (flapping, sweeping, and pitching) to coordinate the perching of a small UAV that flies in a traditional (fixed-wing, prop-driven) configuration. Flight data from initial lab prototypes indicate adequate control authority during low-speed flight for this to be feasible, though several difficult design challenges remain. This talk will report the current status of this line of research.

### Biographical sketch of Thomas Bewley

Prof. Bewley got his BS and MS at Caltech, a diploma from the von Karman Institute for Fluid Dynamics in Belgium, and a PhD from the Center for Turbulence Research at Stanford. He now heads the Flow Control & Coordinated Robotics Labs in the Dynamics Systems and Control group at UC San Diego. His forthcoming book, *Numerical Renaissance: Simulation, Optimization, & Control*, will be available sometime this year (it is currently available on the web at <http://numerical-renaissance.com/>).