UCLA Samueli School of Engineering

Mechanical & Aerospace Engineering Department Seminar

Friday, February 24, 2023, 11 AM – 12 PM
Klug Memorial Seminar Room, 8500 Boelter

Exploring aerial robotic systems for on-demand wind sensing in the lower atmosphere

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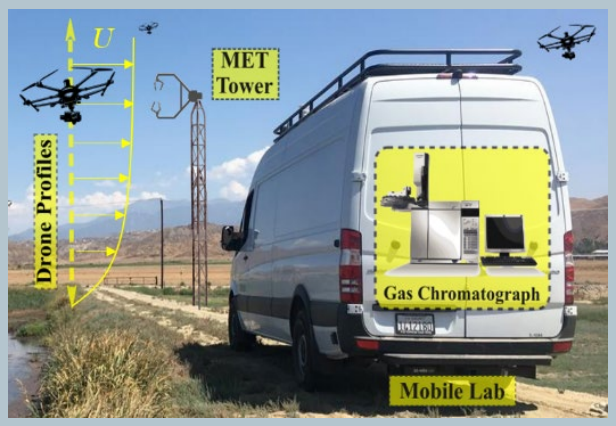
ABSTRACT: Developing aerial robotic systems for measuring wind velocity near the Earth's surface is critical for understanding the surface-atmosphere interactions driving the dynamic state of the atmospheric boundary layer (ABL). How the ABL evolves with respect to space and time affects crop health management, air pollutants transport, extreme weather formation, and wildfire spread. However, most conventional sensors do not reach beyond tens of meters above ground level and are often cost-prohibitive and time-consuming to deploy. This talk will present a model-based framework for on-demand and targeted measurements of atmospheric wind flows using aerial robotic systems. The first part of the talk will present a model-based wind sensing framework for aerial robotic systems that leverages flight data-driven modeling and state estimation techniques. The integration of model-based wind sensing and low-cost sensor technology to reduce the uncertainty methane emissions estimates from both dairy farms and oil and gas fields will be discussed in the second part of this talk.



BIO: Javier González-Rocha is a UC Riverside Chancellor's Postdoctoral Fellow in the Department of Mechanical Engineering. Prior to joining UCR, Dr. González-Rocha earned both a B.S. and M.S. degree in mechanical engineering from CSU-Sacramento, and a Ph.D. degree in aerospace engineering from Virginia Tech. His research leverages system identification, flight dynamic modeling, state estimation, and low-cost sensors to sense wind, turbulence, and air composition within the atmospheric boundary layer using aerial robotic systems. In addition to his research, Dr. González-Rocha is actively engaged with initiatives to increase the participation of historically marginalized communities in STEM fields. For these efforts, Dr. González-Rocha has been recognized with the California State University Louis Stokes Alliance for Minority Participation Award for Outstanding Alumnus & Service/Leadership and the Virginia Tech Aspire Award for Self-Understanding and Integrity.

Host: Professor Taira, ktaira@seas.ucla.edu