

事前申込不要

東北大学大学院工学研究科 次世代航空機研究センターからのお知らせ

TU Next Seminar in Applied Mechanics and Computational Engineering

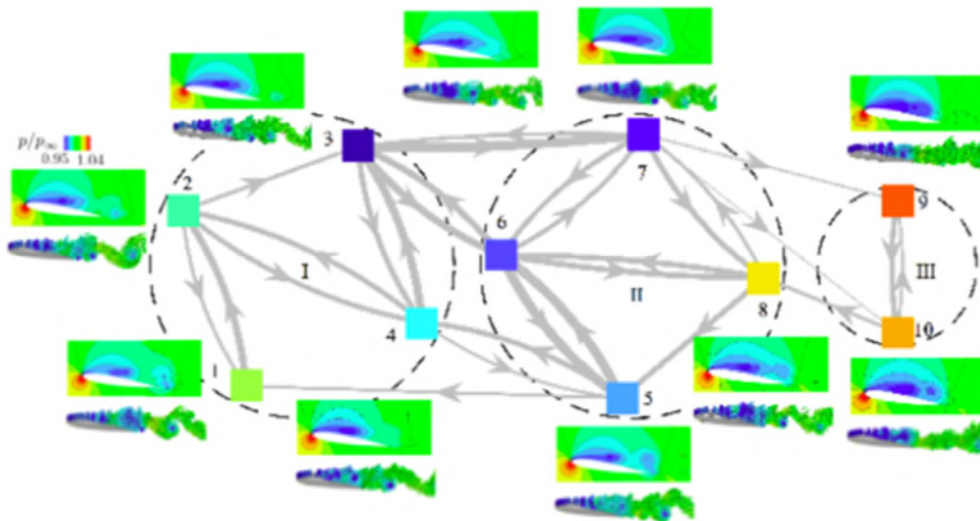
日時:2019年11月15日(金), November 15th 2019, 16:00-17:00

場所:東北大学大学院工学研究科 機械・知能系2号館2階 203室 Room203 Research Building MENo2

講師:Prof. Kunihiko Taira (Mechanical and Aerospace Engineering, UCLA)

演題: Tackling the complex dynamics of unsteady flows

Controlling the behavior of flows around air, marine, and ground vehicles can greatly enhance their performance, efficiency, and safety. The high-dimensionality, strong nonlinearity, and multi-scale properties of these flows make effective control a tremendous challenge. Without the reduction of the state variable dimension and extraction of important dynamics, the application of dynamical systems and control theory for flow control becomes a remains a difficult task. Our research group focuses on developing physics-based approaches to model and control complex fluid flows by leveraging modal analysis, data science, network science, machine learning, and high-performance computing. Equipped with these toolsets, we can extract essential dynamics to facilitate the development of sparse and reduced-order models to design flow control techniques for high-dimensional unsteady fluid flows. We discuss some of the challenges and successes in characterizing, modeling, and controlling unsteady bluff-body wakes and stalled flows over wings. The techniques developed here are tested in DNS and LES computations for validations.



Kunihiko (Sam) Taira is an Associate Professor of Mechanical and Aerospace Engineering at UCLA. His research expertise is on computational fluid dynamics, unsteady aerodynamics, flow control, and data-driven techniques. He received his B.S. degree from the University of Tennessee in Aerospace Engineering and Mathematics, and his M.S. and Ph.D. degrees from the California Institute of Technology in Mechanical Engineering. Prior to his current position, he has a faculty member at the Florida State University. He is a recipient of the

2013 U.S. Air Force Office of Scientific Research and 2016 Office of Naval Research Young Investigator Awards and is active with student-centric teaching.