Kelly Yi-Chun Huang

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Assistant Professor in Mechanical Engineering, University of Houston

Education

Jul 2021	Ph.D.	Mechanical and Aerospace Engineering	Princeton University
Jan 2018	M.A.	Mechanical and Aerospace Engineering	Princeton University
Dec 2015	B.S.	Mechanical Engineering	Cornell University

Research Interests

Environmental Fluid Mechanics ▪ Turbulence ▪ Sensing Techniques ▪ Surface-Atmosphere Interactions ▪ Boundary-Layer Meteorology ▪ Experiments

Research Experience

University of Notre Dame

2021 — 2023 **Postdoctoral Researcher** supervised by Prof. Harindra J. S. Fernando
- fog and turbulence interactions in the marine atmosphere

Princeton University

2016 — 2021 **Graduate Research Assistant** advised by Prof. Marcus Hultmark
- nano-scale measurements in the atmospheric surface layer
- active grid for studying mosquito tracking behavior

Cornell University

2015 — 2016 **Undergraduate Research Assistant** advised by Prof. Charles Williamson
- tested innovative blade designs for urban vertical-axis wind turbines

National Renewable Energy Laboratory

Summer 2015 **Science Undergraduate Laboratory Intern** advised by Dr. Katherine Dykes
- developed a Python toolbox that optimizes the spar supporting structure of offshore wind turbines

Fellowships

2017 **National Defense Science and Engineering Graduate Fellowship** (~ $153k)
United States Department of Defense

2016 **Francis Robbins Upton Fellowship in Engineering** (~ $105k)
School of Engineering and Applied Science, Princeton University

Honors and Awards

2020 **Excellence in Teaching Award**
Engineering Council, Princeton University

2019 **The Luigi Crocco Award for Teaching Excellence**
Mechanical and Aerospace Engineering, Princeton University

2015 **Undergraduate Student of the Year**
Diversity Programs in Engineering, Cornell University

Service

Princeton University

2017 – 2020 MAE Graduate Student Council Representative, Chair

Referee/Reviewer

2021 – present Experiments in Fluids

Invited Presentations

2023 U.S. Naval Academy — Department of Mechanical Engineering
Measuring, Modeling, and Mimicking Atmospheric Turbulent Processes.

National Taiwan University, Taiwan — Hydrotech Research Institute
Measuring, Modeling, and Mimicking Atmospheric Turbulent Processes.

National Central University, Taiwan — Department of Civil Engineering
Measuring, Modeling, and Mimicking Atmospheric Turbulent Processes.

2021 University of Notre Dame, USA — Environmental Fluid Dynamics Seminar
Experimental Methods for Understanding Turbulence in the Lower Atmosphere.

University of California, Davis, USA — Environmental Dynamics Lab Seminar
Experimental Methods for Studying Turbulence in the Lower Atmosphere.

2020 Cooper Union, USA — Albert Nerken School of Engineering Invited Lecture
From Mosquitos to Weather Models — Understanding Turbulence in the Lower Atmosphere.

Select Presentations

2022 [Talk] American Physical Society: Division of Fluid Dynamics
The role of environmental turbulence in the lifecycle of marine fog.

2022 [Talk] American Meterological Society Annual Meeting
The Super Combo Probe for simultaneous high-resolution measurement of velocity and temperature fluctuations in atmospheric turbulence.

2020 [Poster] American Geophysical Union: Fall Meeting
Velocity and Temperature Dissimilarity in the Surface Layer Uncovered by the Telegraph Approximation.

2018 [Poster] American Geophysical Union: Fall Meeting
Simultaneous and Well-resolved Velocity and Temperature Measurements in the Atmospheric Surface Layer.

2018 [Talk] American Physical Society: Division of Fluid Dynamics
Mimicking Atmospheric Flow Conditions to Examine Mosquito Orientation Behavior.

Professional Development

Fall 2020 **Inclusive Leadership Learning Cohort**
GradFutures, Princeton University

Professional Memberships

American Physical Society (APS)
American Geophysical Union (AGU)

Publications

In Prep

K. Y. Huang, T. J. Hintz, and H. J. S. Fernando, "Turbulent equilibrium radius in fog droplet formation," (in prep).

T. J. Hintz, K. Y. Huang, S. W. Hoch, J. Ruiz-Plancarte, and H. J. S. Fernando, "A mechanism for coastal fog genesis at evening transition," *Quarterly Journal of the Royal Meteorological Society* (under review).

Peer-Reviewed

K. Y. Huang, G. G. Katul, T. J. Hintz, J. Ruiz-Plancarte, and H. J. S. Fernando, "Fog intermittency and critical behavior", *Atmosphere* (2023).

H. J. S. Fernando, S. Wang, K. Y. Huang, and E. Creegan, "Fog-laden density staircases in marine atmospheric boundary layer", *Environmental Fluid Mechanics* (2023).

K. Y. Huang, M. K. Fu, C. P. Byers, A. D. Bragg, and G. G. Katul, "Logarithmic scaling of higher-order temperature moments in the atmospheric surface layer", *International Journal of Heat and Fluid Flow.*

K. Y. Huang and G. G. Katul, "Profiles of high-order moments of longitudinal velocity explained by the random sweeping decorrelation hypothesis", *Physical Review Fluids* (2022).

K. Y. Huang, C. E. Brunner, M. K. Fu, K. Kokmanian, T. Morrison, A. O. Perelet, M. Calaf, E. Pardyjak, and M. Hultmark, "Investigation of the Atmospheric Surface Layer Using a Novel High-resolution Sensor Array", *Experiments in Fluids* (2021).

K. Y. Huang, G. G. Katul, and M. Hultmark, "Velocity and temperature dissimilarity in the surface layer uncovered by the telegraph approximation", *Boundary-Layer Meteorology* (2021).

Conference Proceedings

K. Y. Huang, M. K. Fu, C. P. Byers, and G. G. Katul, "Logarithmic scaling of higher-order temperature moments in the atmospheric surface layer", *12th Int. Symp. on Turbulence and Shear Flow Phenomena, Osaka, Japan* (2022).

Teaching

Princeton University

2017 — 2021 Graduate Coordinator for the McGraw Learning and Tutoring Center

Assistant in Instruction

Fall 2019 ▪ MAE 305/MAT 391 – Mathematics in Engineering I
Spring 2019 ▪ MAE 222 – Introduction to Fluid Mechanics
Spring 2018 ▪ MAE 224 – Integrated Engineering Science Laboratory
Fall 2017 ▪ MAE 335 – Fluid Dynamics

Guest Lecturer

Fall 2022 ▪ MAE 551 — Fluid Dynamics
Spring 2022 ▪ MAE 553 — Turbulence

Cornell University

Undergraduate Teaching Assistant

Fall 2015 ▪ MAE 3230 – Introduction to Fluid Mechanics
Fall 2015 ▪ MAE 6510 – Advanced Heat Transfer
Spring 2015 ▪ MAE 2250 – Mechanical Synthesis
Fall 2014 ▪ ENGRD 2020 – Statics and Mechanics of Solids

University of Notre Dame

Guest Lecturer

Fall 2021 & 2022 ▪ CE/AME 40465/60465 — Mechanics of Environmental Motions
Fall 21 — Spr 23 ▪ CE 62400 — Environmental Fluid Dynamics Practicum
Spring 2023 ▪ CE 60430 — Fundamentals of Turbulence Theory

Student Thesis Supervision

2018 — 2019 Ramesh, Gayatri & Huang, Whitney — B. S., Princeton University
Controlling Unmanned Aerial Vehicles in High Wind Speeds Using Nano-Scale Thermal Anemometry Probes

2021 — 2023 Hintz, Thomas J. — M. S., University of Notre Dame
A Mechanism for Coastal Fog Genesis at Evening Transition

Updated: Aug. 2023