Kelly Yi-Chun Huang

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Sep 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

University of Notre Dame

2021 — present

As post-doctoral fellow working with Joe Fernando, I am designing a combo-probe that combines hot-film anemometers, nano-scale cold-wires, and a collocated sonic for high-resolution field measurements. Specifically, the combo-probe will be deployed to study the interaction between fog and turbulence.

Princeton University

2016 — 2021

Experimental Methods for Understanding Turbulence in the Lower Atmosphere
As graduate student working with Marcus Hultmark, I
- fabricated nano-scale velocity and temperature sensors in the clean room,
- designed and tested data acquisition platforms for use in the field,
- analyzed near-surface atmospheric velocity and temperature data, and
- designed a low-cost active grid for studying mosquito tracking behavior.

Cornell University

2015 — 2016

As undergraduate research assistant with Charles Williamson, I designed, fabricated, and tested 3D-printed innovative blades for a mini vertical-axis wind turbine for urban settings.

2012 — 2014

In AguaClara sustainable water treatment design, I built and analyzed a lab-scale rapid sand filter and an electric-free ram pump.

2014 — 2015

As member of Cornell University Sustainable Design, we
- conducted a wind power feasibility study for the Cornell NYC campus,
- formulated a proposal for local wind turbine implementation, and
- constructed a functioning demonstrative wind turbine for outreach.

National Renewable Energy Laboratory

June — Aug 2015

As Science Undergraduate Laboratory Intern (SULI) to Dr. Katherine Dykes, I developed a Python toolbox coupled to OpenMDAO that optimizes the spar supporting structure of offshore wind turbines based on stability designs.

Honors and Awards

2020	Engineering Council's Excellence in Teaching Award	*Princeton*
2019	The Luigi Crocco Award for Teaching Excellence	*Princeton*
2017	National Defense Science and Engineering Graduate Fellowship	*DoD*
2016	Francis Robbins Upton Fellowship in Engineering	*Princeton*
2015	Undergraduate Student of the Year	*Cornell Diversity Programs in Engineering*

Teaching

Princeton University

2017 — 2021 As Graduate Coordinator for the McGraw Learning and Tutoring Center, I manage the undergraduate tutoring program by interviewing, staffing, training, and providing feedback for 140+ tutors.

As assistant in instruction, I held weekly precepts/lab sessions for

- **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

Cornell University

As undergraduate teaching assistant, I held weekly recitations/lab sessions for

- **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

Outreach

Princeton University

2016 – 2021 As part of MAE department educational outreach efforts, I
- undertook coursework on effective science pedagogy for children,
- developed workshops on engineering concepts, and
- led demos for K-8 children from Princeton and New York City.

2017 – 2020 As representative, then Chair, of the MAE Graduate Student Council, I
- organized graduate student events (ie open-house and alumni panels),
- organized and hosted the annual MAE Research Day, and
- designed T-shirts and paraphernalia for such events.

Publications

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).

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* (submitted).

Invited Presentations

2021	University of Notre Dame — Environmental Fluid Dynamics Seminar *Experimental Methods for Understanding Turbulence in the Lower Atmosphere.*
2021	University of California, Davis — Environmental Dynamics Lab Seminar *Experimental Methods for Studying Turbulence in the Lower Atmosphere.*
2020	Cooper Union — Albert Nerken School of Engineering Invited Lecture *From Mosquitos to Weather Models — Understanding Turbulence in the Lower Atmosphere.*

Select Presentations

2020 [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.*
2015 [Pitch & Poster]	Cornell Atkinson Center: Creating a Sustainable Future *Novel Blade Designs for Urban Mini-Turbines.*