Julian Quick

Curriculum Vitae

✉ julian.quick@colorado.edu
Julian Quick
kilojoules
kilojoules
kilojoules

Education

2017–Present **Ph.D. Mechanical Engineering**, *University of Colorado Boulder*, Boulder, Colorado, 3.97 GPA.
Dissertation Title: *Outer-Loop Applications of Computational Fluid Dynamics for Wind Energy Systems*
Advisor: Dr. Peter E. Hamlington

2017–2019 **M.S. Mechanical Engineering**, *University of Colorado Boulder*, Boulder, Colorado.

2010–2015 **B.S. Environmental Resources Engineering**, *Humboldt State University*, Arcata, California.

Professional Experience

2017–Present **Graduate Research Assistant**, *Turbulence and Energy Systems Laboratory*, University of Colorado Boulder, Boulder, Colorado.

- Developed multifidelity uncertainty quantification approach for RANS simulations
- Applied optimization under uncertainty to wake steering problem, screening for most important inputs
- Developed field sensitivity analysis for turbulence models
- Developed multiobjective multifidelity optimization approach for wake steering strategies

Spring 2021 **Graduate Teaching Assistant**, *Mechanical Engineering 7221 / Aerospace Engineering 6037: Turbulence*, University of Colorado Boulder, Boulder, Colorado.

2015 - 2017 **Wind Energy Systems Engineering Intern**, *National Renewable Energy Laboratory*, Golden, Colorado.

- Developed pyDAKOTA software package
- Applied optimization under uncertainty to wake steering problem, assuming large yaw position uncertainties
- Developed systems engineering tools and research

2015 **Tutor**, *Society of Hispanic Professional Engineers*, Humboldt State University, Arcata, California.

2013 - 2015 **Project Manager**, *Humboldt State University Campus Center for Appropriate Technology*, Arcata, California.

2013 **Project Developer**, *Humboldt Energy Independence Fund*, Arcata, California.

Research Interests

Wind energy systems planning, control, and analysis, as well as efficient/multifidelity techniques for optimization, uncertainty quantification, and sensitivity analysis.

Publications

Peer-Reviewed Journal Publications

[1] **Julian Quick**, Jennifer King, Ryan N. King, Peter E. Hamlington, and Katherine Dykes. Wake steering optimization under uncertainty. *Wind Energy Science*, 5(1):413–426, 2020

Submitted Journal Publication

[2] **Julian Quick**, Ryan N. King, Marc T. Henry de Frahan, Shreyas Ananthan, Michael A. Sprague, and Peter E. Hamlington. Field Sensitivity Analysis of Turbulence Model Parameters for Flow Over a Wing. *International Journal for Uncertainty Quantification*, Submitted 2021

Book Chapter

[3] Andrew Ning, Katherine Dykes, and **Julian Quick**. *Systems engineering and optimization of wind turbines and power plants*, volume 2, pages 235–92. Institution of Engineering and Technology, 2019

Conference Proceedings

[4] **Julian Quick**, Peter E. Hamlington, Ryan King N., and Michael A. Sprague. Multifidelity uncertainty quantification with applications in wind turbine aerodynamics. In *AIAA Scitech 2019 Forum*, page 0542, 2019

[5] Peter A Graf, Ryan N. King, Katherine Dykes, **Julian Quick**, Levi Kilcher, and Jennifer Rinker. Temporal coherence importance sampling for wind turbine extreme loads estimation. In *AIAA Scitech 2019 Forum*, page 1798, 2019

[6] Ryan N. King, **Julian Quick**, Christiane Adcock, and Katherine Dykes. Active subspaces for wind plant surrogate modeling. In *2018 Wind Energy Symposium*, page 2019, 2018

[7] Amy N Robertson, Latha Sethuraman, Jason Jonkman, and **Julian Quick**. Assessment of wind parameter sensitivity on extreme and fatigue wind turbine loads. In *2018 Wind Energy Symposium*, page 1728, 2018

[8] Latha Sethuraman, **Julian Quick**, Katherine Dykes, and Yi Guo. Exploring optimization opportunities in four-point suspension wind turbine drivetrains through integrated design approaches. In *2018 Wind Energy Symposium*, page 1000, 2018

[9] **Julian Quick**, Jennifer Annoni, Ryan N. King, Katherine Dykes, Paul Fleming, and Andrew Ning. Optimization under uncertainty for wake steering strategies. In *Journal of physics: Conference series*, volume 854, page 012036. IOP Publishing, 2017

[10] **Julian Quick**, Katherine Dykes, Peter Graf, and Frederik Zahle. Optimization under uncertainty of site-specific turbine configurations. In *Journal of Physics: Conference Series*, volume 753, page 062012. IOP Publishing, 2016

[11] Peter Graf, Katherine Dykes, George Scott, Jason Fields, Monte Lunacek, **Julian Quick**, and Pierre-Elouan Rethore. Wind farm turbine type and placement optimization. In *Journal of Physics: Conference Series*, volume 753, page 062004. IOP Publishing, 2016

Conference Presentations

Conference Presentations by Julian

[1] **Julian Quick**, Sarah Barber, Yu Ding, Berthold Hahn, Mike Kelly, Fiona Lüdecke, Mike Purdue, and Anna Maria Sempreviva, "Shared Semantics and Incentivizing Data Sharing" *International Energy Agency Collaborative Research Task on Wind Energy Digitalization – 3rd General Meeting*, 2021

[2] **Julian Quick**, Ryan N. King, Peter E. Hamlington. "Multiobjective Multifidelity Optimization for Wake Steering Design", *Society for Industrial and Applied Mathematics Conference on Computational Science and Engineering Mini-symposium 140: Multifidelity Sampling Approaches for Forward/Inverse UQ and Optimization under Uncertainty*, 2021

[3] **Julian Quick**, Ryan N. King, Marc Henry de Frahan, Shreyas Ananthan, Michael A. Sprague, and Peter E. Hamlington. "Field sensitivity analysis for wind energy modeling", *Bulletin of the American Physical Society*, 2020

[4] **Julian Quick**, Peter E. Hamlington, Ryan N. King, Marc Henry de Frahan, Shreyas Ananthan, Michael Sprague, "Field Sensitivity Analysis for Wind Energy Modeling," *Rocky Mountain Fluid Mechanics Research Symposium*, 2020

[5] **Julian Quick**, Peter E. Hamlington, Ryan N. King, Michael Sprague, "Capturing a Blade Tip Vortex," *Rocky Mountain Fluid Mechanics Research Symposium*, 2019

[6] **Julian Quick**, Peter E. Hamlington, Ryan N. King, and Michael A. Sprague, 2019. "Multifidelity Uncertainty Quantification with Applications in Wind Turbine Aerodynamics". In *AIAA Scitech 2019 Forum*

[7] **Julian Quick**, "Optimization Under Uncertainty for Wake Steering Strategies," *Wake Conference*, 2017

[8] **Julian Quick**, Jennifer Annoni, Ryan N. King, Paul Fleming, Andrew Ning, and Katherine Dykes, "Optimization Under Uncertainty for Wind Power Plant Wake Steering Strategies," *Rocky Mountain Fluid Mechanics Research Symposium*, 2017

[9] **Julian Quick**, Jennifer Annoni, Ryan N. King, Katherine Dykes, Paul Fleming, Andrew Ning. "Optimization Under Uncertainty for Wake Steering Strategies," *Wind Energy Science Conference,* 2017

Presentations with Collaboration from Julian

[10] Rob Hammond, Alex Koltsidopoulos, **Julian Quick**, "Data Science Quick Start Tutorial and Hackathon" *International Energy Agency Collaborative Research Task on Wind Energy Digitalization – 3rd General Meeting*, 2021

[11] Peter Graf, Ryan N. King, Katherine Dykes, **Julian Quick**, Levi Kilcher, Jennifer Rinker, "Temporal Coherence Importance Sampling for Wind Turbine Extreme Loads Estimation", *AIAA Scitech 2019 Forum*

[12] Ryan N. King, **Julian Quick**, Christiane Adcock, Katherine Dykes, "Active Subspaces for Wind Plant Surrogate Modeling", *AIAA Wind Energy Symposium*, 2018

[13] Latha Sethuraman, **Julian Quick**, Katherine Dykes, Yi Guo, "Exploring Optimization Opportunities in Four-Point Suspension Wind Turbine Drivetrains through Integrated Design Approaches", *AIAA Wind Energy Symposium*, 2018

[14] Katherine L. Dykes, Rick R. Damiani, Peter A. Graf, George N. Scott, Ryan N. King, Yi Guo, **Julian Quick**, Latha Sethuraman, Paul S Veers, and Andrew Ning. Wind turbine optimization with wisdem. Technical report, National Renewable Energy Laboratory (NREL), Golden, CO, 2018

Professional Service

Lectures

2021 **Invited Lecture**, *Wind Energy Overview*, Environmental Science 15: Energy for a Sustainable Future.
Cabrillo College, Aptos, California

2019 **Public Lecture**, *What's Blowing in the Wind? Wind Turbine Modeling and Wind Farm Optimization*, Pint of Science.
Diebolt Brewing Company, Denver, Colorado

Organizations

2021–Present **Founding Member**, *Committee for Equity in Mechanical Engineering (CEME)*, Paul M. Rady Mechanical Engineering.
University of Colorado Boulder, Boulder, Colorado

2020–Present **Contributing Researcher**, *IEA Wind Task 43*, Data Science, Data Standards, and Data Sharing.

2014–2015 **President**, *Renewable Energy Student Union*.
Humboldt State University, Arcata, California

Mentorship

2020 **Mentor**, *Fluid Dynamics Preliminary Exam Preparation*, Paul M. Rady Mechanical Engineering.
University of Colorado Boulder, Boulder, Colorado

2016–2018 **Peer Mentor**, *Women of Wind Energy*.

Peer Review Service

Wind Energy, *Sustainable Energy Technologies and Assessments*, *Journal of Wind Engineering and Industrial Aerodynamics*, *Renewable Energy*