

# Julian Quick

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## EDUCATION

### **Mechanical Engineering | University of Colorado Boulder**

Expected graduation 2022 | PhD | Boulder, CO, USA

### **Mechanical Engineering | University of Colorado Boulder**

Graduated 2019 | Master of Science | Boulder, CO, USA

### **Environmental Resources Engineering | Humboldt State University**

Graduated 2016 | Bachelor of Science | Arcata, CA, USA

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## SOCIETIES

### **President** | Renewable Energy Student Union | Humboldt State University | 2014 - 2015

Led photovoltaic panel current-voltage curve analysis and off-grid facility energy audit. Team leader of IEEE Energy Forecasting and U.S. Department of Energy Race to Zero Energy residential housing design competition teams.

### **Vice President** | Renewable Energy Student Union | Humboldt State University | 2013 - 2014

Designed and constructed pico hydro demonstration unit, analyzed wind and solar data for two local clients. Awarded second place in the 2014 IEEE International Hydrogen Education Foundation Hydrogen Fueling Station Design Competition, leading a team of 12 students.

### **Peer Mentor** | Women of Wind Energy | National Renewable Energy Laboratory | 2016 - 2018

Regularly met with coworkers to discuss life, society, and paths to greater inclusivity in the workplace.

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## PUBLICATIONS

**Quick, J.**, Dykes, K., Graf, P., & Zahle, F. (2016, September). Optimization under uncertainty of site-specific turbine configurations. In *Journal of Physics: Conference Series* (Vol. 753, No. 6, p. 062012). IOP Publishing.

Graf, P., Dykes, K., Scott, G., Fields, J., Lunacek, M., **Quick, J.**, & Rethore, P. E. (2016, September). Wind farm turbine type and placement optimization. In *Journal of Physics: Conference Series* (Vol. 753, No. 6, p. 062004). IOP Publishing.

**Quick, J.**, Annoni, J., King, R., Dykes, K., Fleming, P., & Ning, A. (2017, May). Optimization under uncertainty for wake steering strategies. In *Journal of Physics: Conference Series* (Vol. 854, No. 1, p. 012036). IOP Publishing.

Sethuraman, L., **Quick, J.**, Dykes, K., & Guo, Y. (2018). Exploring Optimization Opportunities in Four-Point Suspension Wind Turbine Drivetrains through Integrated Design Approaches. In *2018 Wind Energy Symposium* (p. 1000).

Robertson, A. N., Sethuraman, L., Jonkman, J., & **Quick, J.** (2018). Assessment of Wind Parameter Sensitivity on Ultimate and Fatigue Wind Turbine Loads (No. NREL/CP-5000-70445). National Renewable Energy Lab.(NREL), Golden, CO (United States).

King, R., **Quick, J.**, Adcock, C., & Dykes, K. (2018). Active Subspaces for Wind Plant Surrogate Modeling. In *2018 Wind Energy Symposium* (p. 2019).

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## **PUBLICATIONS**     *(continued)*

Robertson, A.N., Sethuraman, L., Jonkman, J. and **Quick, J.**, 2018. Assessment of wind parameter sensitivity on ultimate and fatigue wind turbine loads (No. NREL/CP-5000-70445). National Renewable Energy Lab.(NREL), Golden, CO (United States).

Dykes, K.L., Damiani, R.R., Graf, P.A., Scott, G.N., King, R.N., Guo, Y., **Quick, J.**, Sethuraman, L., Veers, P.S. and Ning, A., 2018. Wind Turbine Optimization with WISDEM (No. NREL/PR-5000-70652). National Renewable Energy Lab.(NREL), Golden, CO (United States).

Graf, P.A., King, R., Dykes, K., **Quick, J.**, Kilcher, L. and Rinker, J., 2019. Temporal Coherence Importance Sampling for Wind Turbine Extreme Loads Estimation. In AIAA Scitech 2019 Forum (p. 1798).

**Quick, J.**, Hamlington, P.E., King, R. and Sprague, M.A., 2019. Multifidelity Uncertainty Quantification with Applications in Wind Turbine Aerodynamics. In AIAA Scitech 2019 Forum (p. 0542).

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## **TECHNICAL EXPERIENCE**

### **Research Assistant** | May 2017 - Present

Turbulence and Energy Systems Laboratory | National Wind Technology Center | Boulder, CO

- Investigated two- and three-dimensional turbulent flows for wind energy applications.
- Demonstrated methods for efficient uncertainty propagation using spectral techniques and multifidelity-multilevel Monte Carlo Simulation.
- Assisted in heat pipe and industrial roller optimizations.
- Demonstrated optimization under uncertainty approach for wake steering strategies.
- Assisted in sensitivity analysis studies of turbulence model parameters, physical values in the flow over a wing, parameters in synthetic turbulence generation, and parameters in the FAST wind-turbine fatigue model and Open-FAST wind power plant model.
- Demonstrated the active subspace dimension-reduction approach for wind power plant control strategies and flow in a converging-diverging nozzle.

### **Wind Energy Systems Engineering Intern** | May - August 2015, January 2016 - May 2017

National Renewable Energy Laboratory | National Wind Technology Center | Boulder, CO

- Developed Python optimization driver allowing the National Aeronautics and Space Administration's OpenMDAO optimization framework to access parallelized surrogate modeling, optimization, and uncertainty quantification methods from Sandia National Laboratories' DAKOTA optimization engine to allow for stochastic optimization of wind farm simulations.
- Authored poster "Optimization Under Uncertainty of Site-Specific Turbine Configurations," presented by Dr. Katherine Dykes at the *Journal of Physics*' 2016 TORQUE conference.
- Presented poster at 2016 American Wind Energy Association Resource Assessment and Planning Conference: "Making the Case for Robust Optimization in Wind Plant Design."

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## TECHNICAL EXPERIENCE *(continued)*

### **Tutor** | August 2015 - December 2016

Humboldt State University Society of Hispanic Professional Engineers | Arcata, CA

- Tutored students in lower-division undergraduate engineering courses.

### **Software Engineering Intern** | May 2014 - September 2014

National Center for Atmospheric Research | Earth Observing Laboratory | Boulder, CO

- Created Python-based live SQL data monitoring system to inform Research Technicians when atmospheric data collected is outside of metadata range.
- Restructured metadata file: C binary to XML converter, C++ application programming interface, and Python PYQT graphic user interface (GUI).
- Programmed PYQT GUIs for project managers to edit configuration files.

### **Teaching Assistant** | January 2014 - December 2015

Humboldt State University | Computational Methods for Engineers | Arcata, CA

- Facilitated weekly classroom Fortran programming laboratories.
- Graded programming and probability theory assignments.
- Facilitated lectures and quizzes when professor was unavailable.

### **Software Development Volunteer** | September - December 2014

Propulsion, Inc | Canary Instruments | Arcata, CA

- Created Python home energy data visualization tool using pandas and matplotlib.
- Developed C++ data parsing and bit shifting tool.

### **Project Manager** | September 2013 - December 2015

Campus Center for Appropriate Technology | Arcata, CA

- Executed and managed projects building on-site wetland greywater treatment system, photovoltaic energy monitor, tandem and single bicycle-powered blenders, and 1,500 gallons of rainwater catchment.

### **Technical Reviewer** | March 2015 - August 2015, May-June 2019

PACKT Publishing

- Reviewed "Mastering Python Data Visualization" and "Python Data Mining Quick Start Guide."
- Tested code and provided editorial feedback.
- Acknowledged as one of two technical reviewers in the published book.

### **Project Developer** | September 2013 - December 2015

Humboldt Energy Independence Fund | Arcata, CA

- Collected indoor lighting measurements, researched lighting control products, and collaborated with a campus electrician to design four possible system scenarios.
- Created Fortran annual lighting simulation using cloud cover data to estimate project payback period.

### **Open-Source Contributor** | September 2013 - Present

Github.com/kilojoules

- Contributed source code to the Nalu-Wind, windrose, xgboost, WISDEM, FLORIS, and OpenMDAO open-source python packages.