Stanford

Christiane Marie Otten Adcock

Ph.D. Student in Computational and Mathematical Engineering, admitted Autumn 2018

Bio

BIO

I develop theoretical and computational methods to model, design, and control energy systems.

Currently, I am researching uncertainty quantification of numerical solutions to PDEs using Multilevel Monte Carlo and task-based parallel computing in the Stanford Uncertainty Quantification lab.

Previously, I worked at DNV GL forecasting wind farm power production, at the National Renewable Energy Laboratory incorporating atmospheric conditions in wind farm flow models, and at Tesla analyzing loads on electric vehicles.

HONORS AND AWARDS

- Computational Science Graduate Fellowship, Department of Energy (2018-2022)
- Knight-Hennessy Scholar, Stanford (2018-2021)
- Graduate Research Fellowship (declined), National Science Foundation (2018)

EDUCATION AND CERTIFICATIONS

- BS, Massachusetts Institute of Technology , Mechanical Engineering (2018)

STANFORD ADVISORS

- Gianluca Iaccarino, Doctoral (Program)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

I research theoretical and computational methods to model, design, and control energy systems. These methods include computational fluid dynamics, uncertainty quantification, reduced order models, optimization and control algorithms, and high performance computing. Improved methods could increase renewable energy generation from wind turbines, hydro turbines, and concentrated solar power, reduce energy consumption from cars, trucks, ships, and airplanes, incorporate renewable energy and electric vehicles in the electricity grid, and enable carbon sequestration.

Publications

PUBLICATIONS

- **Analysis of control-oriented wake modeling tools using lidar field results** *WIND ENERGY SCIENCE*

Annoni, J., Fleming, P., Scholbrock, A., Roadman, J., Dana, S., Adcock, C., Porte-Agel, F., Raach, S., Haizmann, F., Schlipf, D.
2018; 3 (2): 819–31

- **Data-Driven Wind Farm Optimization for Turbulence Intensity** *American Control Conference*
  Adcock, C., King, R. N.
  2018
- **Data-Driven Machine Learning for Wind Plant Flow Modeling**
  King, R. N., Adcock, C., Annoni, J., Dykes, K., IOP
  IOP PUBLISHING LTD.2018
- **Active Subspaces for Wind Plant Surrogate Modeling** *American Institute of Aeronautics and Astronautics*
  King, R., Quick, J., Adcock, C., Dykes, K.
  2018