Daniel A. Farbowitz

Physicist, Data Scientist

Daniel A. Farbowitz
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Master's Advisor: Dr. Jenny Clark, *Vice-Chancellor's Advanced Fellow, University of Sheffield*

Dissertation: *"Organic solar cells: the role of solvents in device performance as studied by ultrafast spectroscopy"*

Research Interests

Machine learning (Python), natural language processing, algorithm optimization, quantum optics, photonics, vibronic coupling, thin-film solar cells, solar cell morphology, nanoparticles, emerging renewables

Education

University of Sheffield / MSc, with distinction, in Physics - Solar Cell Technology
OCTOBER 2020 - SEPTEMBER 2021, Sheffield, UK

Postgraduate taught program covering principles, implementation, innovation, coding, and analysis in various solar technologies. My dissertation research involved fabricating solvent-based bulk heterojunction organic solar cells and comparing them to water-based nanoparticle ink organic solar cells using ultrafast transient absorption spectroscopy.

Johns Hopkins University / Master's Program: Applied Physics concentrating in Photonics (no degree)
SEPTEMBER 2019 - JUNE 2020 Baltimore, MD, USA

Within a photonics program, completed courses on quantum mechanics, principles of optics, modern physics, and sustainable energy.

Pennsylvania State University / BS, Mathematics; BS, Physics
AUGUST 2007 - DECEMBER 2011, University Park, PA, USA

Member of Sigma Pi Sigma honor society. Studied in Germany through Dotterer Fellowship. Additionally received a BA in philosophy concentrating on philosophy of science and philosophy of education.

Work Experience

Benjamin Franklin Institute of Technology / Adjunct Instructor in Physics and Mathematics
DECEMBER 2018 - JUNE 2021, Boston, MA

Led up to 20-student classrooms. Taught fundamental math, geometry, pre-calculus, conceptual physics, physics I, and physics lab. Reached out frequently to keep students engaged. Tutored several hours a week.

Arbor Tutoring / Lead Tutor
APRIL 2011 - NOVEMBER 2018, Boston, MA

Spent 3000+ hours teaching math and physics at college level as an independent tutor, primarily focused on calculus and statistics. Reviewed relevant coursework and developed lesson plans. Devoted several non-session hours per week to answering tutees' questions.

Leadership Experience

University of Sheffield / Student Representative (Physics PGT)
NOVEMBER 2020 - SEPTEMBER 2021, Sheffield, UK

Addressed postgraduate physics students' course concerns in collaboration with physics administration to better facilitate learning in an online teaching environment. Organized student meetups. Served on the Equality, Inclusion, and Diversity Committee.

The NAN Project / Mentor
APRIL 2017 - AUGUST 2020, Boston, MA

Trained in assisting at-risk youth and suicide prevention.

Laboratory and Research Experience

Python coding, R coding, experimental design, ANOVA, multiple linear regression, statistical modeling (GLM, GLMM), data harvesting, ultrafast transient absorption spectroscopy, data analysis, organic solar cell fabrication, solar cell characterization, circuit design, laser alignment and safety certification

Current Projects

Solvents in Non-fullerene Acceptor Photovoltaics / Co-author

Performed fs-µs analysis of organic solar cell active layers with transient absorption spectroscopy. Analyzed data in glotaran using several proprietary programs to characterize using unique kinetic models.

***American Anthropologist* – A Meta-Analysis** / Co-author

Wrote Python data harvesting algorithm that organized unique research in the journal's 133-year history into spreadsheet format.