BradyPlanden

Contact

brady.planden
Google Scholar
GitHub
Twitter
LinkedIn

Software

Julia / Python / MATLAB
Linux / macOS / Windows
Pytorch
Git / CI+CD
Proxmox / ZFS
LaTeX / Markdown

Expertise

Energy Storage Modelling
OSS Development
Testing & Automation
Data-Driven Modelling
HPC

Interests

Cycling
Hiking
Computing

Education

2018– Sept '22 **Ph.D.** in Mechanical Engineering — Oxford Brookes University
Thesis: Improvements on Physics-Informed Models for Lithium Batteries
Supervisor: Prof. Denise Morrey

2011– 2016 **B.Eng.** in Mechanical Engineering — University of Victoria
Thesis: One-Dimensional Combustion Engine Modelling and Optimisation

Research Statement

My research interests aim to improve next-generation electrochemical design and fast real-time capable models for high-performance energy storage applications. This includes advancements in parameterisation methods for data-driven, physics-informed models aimed towards reducing global climate impact.

Professional Appointments

2021– **Oxford Brookes University** — Oxford, UK
Research Fellow in Future of Transport

- Funding Acquisition & Creation of the High Voltage & Energy Storage Lab
- Created Data Acquisition Methodology and Automated Storage for Lab Data
- Developed Open-Source Electrochemical Research Packages (LiiBRA.jl / BattPhase.jl / BattCalc.jl)
- Released an Open-Source Battery Testing Consortium (BTC) for Electric Formula Student Teams
- Led External Industrial Collaborations in eVTOL and eBicycle Research
- Mentored and Supervised Research Students

Journal Papers

Planden et al. (2022) "A Computationally Informed Realisation Algorithm for Lithium-Ion Batteries Implemented with LiiBRA.jl". Journal of Energy Storage, Accepted.

Jang et al. (2022) "BattPhase – A convergent, non-oscillatory, efficient algorithm and code for predicting shape changes in lithium metal batteries using phase-field models – 1. Secondary Current Distribution". Journal of The Electrochemical Society, 2022.

Teaching

2021– **B.Eng Dissertation, Oxford Brookes University** — 3 Students
Project creation, supervision, and marking for B.Eng dissertation projects. This includes introducing project management skills, research methods, and guidance for successful data acquisition.

2019– **M.Sc Dissertation, Oxford Brookes University** — 5 Students
Project creation, supervision, and marking for MSc dissertation projects. This includes technical support and research guidance for students aiming for journal publications.

2019– **M.Eng Dissertation, Oxford Brookes University** — 10 Students
Project creation, supervision, and marking for M.Eng dissertation projects. This includes both career, academic, and project guidance for groups of four students.

Grants & Awards

2021 **Oxford Brookes University**
Enhancing the Future of Transport and Urban Infrastructure. £2,000
Research Excellence Award for Postdoctoral Researchers. £6,000

2022, 2019 **Research Internships in Science and Engineering Germany**
Awarded Undergraduate Research Student.

Conferences

2022 Message Passing Neural Solvers for Moving Boundary Anode-Free Lithium Metal Batteries
Gordon Research Conference - Batteries. Poster.

2022 Battery Testing Consortium: Improvements in High-Power Battery Design
Advanced Battery Power. Poster.

2020 Real-Time Capable Cell Models in Electric Motorsport Controls
Oxford Battery Modelling Symposium. Poster.

Invited Talks

2022 IMechE Webinar Series
"Improving Battery Technology for Energy Storage and Transport Applications"

2021 University of Victoria
"Lithium-ion Battery Reduced Order Modelling & Open-Source Test Methods"

Departmental Talks

2021 Oxford Brookes University
"Lithium-ion Battery Modelling and Reduced-Order Techniques"

Industrial Experience

2016–2018 **AVL North America** MI, USA
Project Engineer I - Engine Controls
- Researched and Implemented ML-Based Engine Controls
- Numerical One-Dimensional Engine Model Creation & Validation
- Implemented Physics Based Engine Controls with MATLAB & Simulink
- Experimental Data Acquisition and Automation for Model Parameterisation

Extra-Curricular Advisership

2018– **Oxford Brookes Racing** Oxford, UK
- Mentored Students in Academic, Career, Personal Development
- Outlined Team Direction for Multi-Year Success and Improvements
- Developed Research Topics for High-Performance Battery Pack Designs
- Placed 2nd Overall in 2018 & 2019 Seasons at Formula Student UK