BradyPlanden

Contact
brady.planden ✉
Google Scholar 🎓
GitHub ⭘
Twitter 🐦
LinkedIn 💼

Software
Julia / Python / Matlab
Linux/ MacOS /
Windows
Git / CI+CD
Proxmox / ZFS
LaTeX / Markdown

Expertise
Energy Storage
Modelling
Testing & Automation
Data-Driven Modelling

Interests
Cycling
Hiking
Computing

Education

2018–2022   **Ph.D.** in Mechanical Engineering   Oxford Brookes University
Thesis: Improvements on Physics-Informed Models for Lithium Batteries

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

Research Statement

My research aims to improve parameter estimation and optimisation frameworks for next-generation lithium batteries. Rapid parameterisation and optimisation of open-source battery models is an ongoing challenge to advance battery design and lifetime in order to meet global climate goals. This includes the development of Bayesian techniques for non-destructive, data-driven parameterisation of physics-informed models.

Professional Appointments

2023–   **University of Oxford**   Oxford, UK
Postdoctoral Research Assistant
• Research in estimation and optimisation frameworks for next generation, high-voltage LNMO batteries
• Open-source development and test automation for PyBaMM
• Organisation of the 2023 Oxford Battery Modelling Symposium

2021–2023   **Oxford Brookes University**   Oxford, UK
Research Fellow in Future of Transport
• Funding & creation of the High Voltage & Energy Storage Lab
• Developed open-source software: LiiBRA.jl / BattPhase.jl / BattCalc.jl
• Developed an open-source battery testing consortium (BTC)
• Automated experimental data acquisition and storage workflow
• Led external industrial collaborations in eVTOL and eBicycle research

Journal Papers

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

Jang et al. "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.

Leonard et al. "Investigation of Constant Stack Pressure on Lithium-Ion Battery Performance". Under review.

Industrial Positions

2016–2018   **AVL North America**   MI, USA
Project Engineer I - Engine Controls
• Developed ML-based online-capable combustion control structures
• Creation & validation of 1D combustion model
• Developed physics-based engine controls with MATLAB & Simulink
• Data acquisition and automation for model parameterisation

Teaching

2021 – 2022	B.Eng Dissertation, Oxford Brookes University	3 Students
2019 – 2022	M.Sc Dissertation, Oxford Brookes University	5 Students
2019 – 2022	M.Eng Dissertation, Oxford Brookes University	10 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, **Research Internships in Science and Engineering Germany**
2019 Funded 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

Battery Modelling Webinar Series
ium-Ion Battery Realisation Algorithms (LiiBRA)"

binar Series
ry Technology for Energy Storage and Transport Ap-

rder Modelling