Zihao Zhou

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Oxford, UK

Education

University of Oxford Sep 2021 - May 2025

Electrical Engineering Oxford

- A Ph.D Student at Battery Intelligence Lab, Engineering Science Department
- Supervised by Prof. David Howey, fully funded by CSC-Oxford Scholarship
- Research Direction: Physics-informed data-driven models for battery health diagnosis and prognosis

Tsinghua University Aug 2018 - Jun 2021

Electrical Engineering

- Master of Science
- GPA: 3.51/4.0
- Relevant Courses: Learning from Data, Big Data Machine Learning, Estimation of Dynamical System, Reinforcement Learning in Energy Systems, Power Systems and Market Operations

University of California, Berkeley Aug 2020 - May 2021

Industrial Engineering

- Master of Engineering
- M.Eng Opportunity Grant ($16,000)
- GPA: 3.77 / 4.0
- Main Coursework: Application in Data Analysis, Optimization Analytics, Risk Modeling Simulation & Data Analysis

Nanjing University of Science and Technology Aug 2014 - Jun 2018

Material Physics Nanjing

- Bachelor of Engineering
- Major GPA: 3.83 / 4.0
- Main Coursework: Advanced mathematics, Linear algebra , Semiconductor physics, Fundamentals of material science, Physical chemistry of materials

Research Experiences

Bayesian hierarchical modelling for battery lifetime early prediction Apr 2022 - Oct 2022

First author, Accepted by IFAC 2023 Conference

A hierarchical Bayesian linear model is proposed for battery life prediction, combining both individual cell features (reflecting manufacturing variability) with population-wide features (reflecting the impact of cycling conditions on the population average)

Few shot cross domain battery capcacity estimation Sep 2020 - May 2021

First author, Accepted by Ubicomp & ISWC 2021 Conference

A Semi-supervised joint distribution optimal transport method is proposed in this paper, which can effectively address the domain shift problem existing in battery capacity estimation.

A fast screening framework for second-life batteries based on an improved bisecting K-means algorithm combined with fast pulse test Sep 2018 - Apr 2020

Journal

First author, Accepted by Journal of Energy Storage

- Proposed an improved bisecting K-means algorithm based on the short pulse test data to solve the problem of retired battery clustering. This method reduce the overall estimation time from hours to minutes with a high accuracy(88%)

Data-driven Fast Clustering of Second-life Lithium-ion Battery: Mechanism and Algorithm Mar 2019 - May 2020

Co First author Accepted by Advanced Theory and Simulations Journal

- This article is an extension of the above. In the algorithm part, similar algorithm framework was used, but based on different battery test modes, more features from the recovery stage of battery charging and discharging were introduced and discussed.

Data-based Energy Storage System Configuration and Operation Considering Degradation Cost Nov 2019 - May 2020

Second author, Accepted by 2020 IEEE Sustainable Power and Energy Conference Conference

- This paper presents a data-based battery configuration-operation integrated framework to help bring economic benefit for the user. The framwork consists of three parts: 1. Predictions of future load and eletricity rate; 2. An open-loop optimization problem to configure the battery operating constraints; 3. A Model Predictive Control method to realize optimal battery operation.

A gradient screening approach for retired lithium- ion batteries based on X-ray computed tomography images Nov 2018 - Mar 2020

Journal

Fourth author, Accepted by RSC Advances

- In this paper, scanned X-ray Computed Tomography (CT) cross-sectional images in combination with a computational image recognition algorithm have been employed to explore the gradient screening of retired batteries.

Professional Experience

University of Oxford Feb 2023 - Mar 2023

Lab demonstrator, Electrical Machines Laboratory Oxford

- Demonstrated and assessed Oxford undergraduates on a DC/AC machine characterization task.

University of Oxford Feb 2022 - Mar 2022

Lab demonstrator, Instrumentation and Control Laboratory Oxford

- Demonstrated Oxford undergraduates on designing a PID controller for a Quanser Aero Equipment using Matlab Simulink.

Tencent Oct 2019 - Dec 2020

Machine learning intern, IEG department Shenzhen

- The main project of our team: building an AI agent for mahjong game based on Deep Resnet and Monte Carlo Tree search (similar model structure with AlphaGo)
- Responsible for building a clustering model for action distributions (substituting Euclidean distance by wasserstein distance).

Language

- **TOEFL:** 108(Reading: 30, Listening: 30, Speaking: 23, Writing: 25)
- **GRE:** 321 (Verbal: 153, Quantitative: 168, Writing: 4.0)

Awards

- Chinese Scholarship Council (CSC)- Oxford Scholarship (2021-2025)
- MEng Opportunity Grant, UC Berkeley. (2020)
- Meritorious Winner Award, Interdisciplinary Contest in Modeling 2017
- The First Prize Scholarship (2015.Spring/2015.Fall/2016.Fall)
- The Second Prize Scholarship (2014.Fall/2016.Spring)
- First Prize of Physics Competition, 2015