

## Contact

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## Top Skills

Topology

Charging Systems

Finite Element Analysis (FEA)

# Akhil Garg

Director of Battery Design & Analysis Lab (BDAL)  
Wuhan, Hubei, China

## Summary

I am Dr. Akhil Garg, is currently working as an Associate Professor at School of Chemistry and Materials Science at Xi'an Jiatong-Liverpool University at Suzhou, China (near Shanghai). This is a joint UK-China Initiative to establish a campus. Previously, he had worked at Mechanical Science and Engineering at Huazhong University of Science and Technology (HUST), China. He also taught course on "Battery failures" at China-European Union (EU) Institute of Cleaner and Renewable energy at HUST. He is also external advisory board member of BatCAT Project (about batteries) funded by EU..

I did PhD Studies and Post doctorate from Nanyang Technological University (NTU), Singapore.

Research and Teaching background:

My current research areas include Thermal management of batteries; Multiphysics modelling; Topology design optimization for battery cooling plates design; Digital twins for EV batteries states estimation; Fast charging protocols optimization

I am Associate Editor of ASME Journal of Electrochemical Energy Conversion and Storage; International Journal of Green energy; International Journal of Ambient Energy. I am PI of an energy storage project sponsored by Queen Mary University of London and my University.

During my post-PhD experience, I have taught the following courses:

(1) Engineering of Electric vehicles (EVs)

(2) Batteries for EVs:

Multidisciplinary Perspective

(3) Renewable Energy and New Energy Technologies

(4) Energy Storage Systems

- (5) Battery Management systems
  - (6) Intelligent Energy Systems
  - (7) Heat transfer
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## Experience

Xi'an Jiaotong-Liverpool University

Associate Professor

June 2025 - Present (4 months)

Suzhou, Jiangsu, China

Dr. Akhil Garg is currently working as an Associate Professor at School of Chemistry and Materials Science at XJTLU. Previously, he had worked at Mechanical Science and Engineering at Huazhong University of Science and Technology (HUST), China and Indian Institute of Technology (IIT), Delhi. He also taught course on “Battery failures” at China-European Union (EU) Institute of Cleaner and Renewable energy at HUST. He is also external advisory board member of BatCAT Project (about batteries) funded by EU. His PhD is from School of Mechanical and Aerospace Engineering from Nanyang Technological University, Singapore. During his PhD, he has worked jointly with Aerospace Industry, Rolls-Royce (UK), Singapore for 2 years on Artificial Intelligence and Robust Design optimization from the year 2010-2012. His main research interests includes Machine learning for battery synthesis; Genetic programming; AI-driven Topology optimization for cleaner energy; He has been listed in Stanford Elsevier World's Top 2% Scientists List for the last 2 years. He has experience of presiding over the Hubei NSFC (2023-2025) project on deep learning-driven topology optimization for battery cold plate design; Guangdong talent project (2016-2019); International academic project jointly with Queen Mary University of London (2022-2023) and St. Petersburg State University of Russia (2023-2024). He has published over 100 peer reviewed articles in this field and have scopus H-index of 47.

Link to my webpage profile: <https://scholar.xjtlu.edu.cn/en/persons/AkhilGarg>

Huazhong University of Science and Technology

2 years 4 months

Director of Battery Design & Analysis Lab (BDAL)

June 2023 - Present (2 years 4 months)

## China

Leading the Battery Design & Analysis Lab (BDAL) at Huazhong University of Science and Technology. I am managing the team of 20 students from multi-diverse backgrounds from China, Russia, India (IITs; NITs; etc.), Malaysia, Vietnam, and Bangladesh etc. in the following directions:

### (1) Real-time thermal management of battery packs in Electric Vehicles:

Suppose, we are given with Industry problem where battery is already fitted in Electric car, how do we optimize the thermal management in real-time. Our team had specifically designed the AI-driven hardware monitoring system using reinforcement learning and controller design to efficiently monitor and optimize the flow rate parameters with time to maintain the temperature and temperature variations in the battery pack in the normal range.

### (2) Topology optimization of Battery packs cooling plates:

Our team has been working with eminent industry partners to structurally design the entire Battery pack cooling plates (traditionally rectangular plates were used) so as to maximize the heat transfer rate, reduce pressure drop, reduce the weight, etc.

### (3) Adaptive and Optimal fast charging technologies for improved battery life:

Usually, the battery life decreases using fast charging methods as it increases heat generation rate. We had specifically designed a novel health-aware battery fast charging method that considers battery aging also while optimizing the charging protocols (CC-CV switch over point) in real-time.

### (4) Reusability of spent battery packs by intelligent identification and sorting of cells using robotics-based AI approach designed using non-destructive physics-based measurements:

Our team is working on research problem to identify those cells in the spent batteries and estimate the remaining useful life using robotics-based-AI approach designed on non-destructive physics-based measurements.

Associate Professor

June 2023 - May 2025 (2 years)

Hubei, China

My current research areas include Thermal management of batteries; Multiphysics modelling; Topology design optimization for battery cooling plates

design; Digital twins for EV batteries states estimation; Fast charging protocols optimization

I am Associate Editor of ASME Journal of Electrochemical Energy Conversion and Storage; International Journal of Green energy; International Journal of Ambient Energy. I am PI of an energy storage project sponsored by Queen Mary University of London and my University.

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Technologies
- (4) Energy Storage Systems
- (5) Battery Management systems
- (6) Intelligent Energy Systems
- (7) Heat transfer

Akhil Garg

Associate Professor

China-EU Institute of Cleaner and Renewable Energy

School of Mechanical Science and Engineering

Huazhong University of Science and Technology (HUST)

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Academic page link: <http://english.mse.hust.edu.cn/info/1090/2192.htm>

Associate editor of the ASME Journal of Electrochemical Energy Conversion and Storage (ASME Scientific Citation Index (SCI)).

Google link: [https://scholar.google.com/citations?user=51TMv\\_AAAAAJ&hl=en&authuser=1](https://scholar.google.com/citations?user=51TMv_AAAAAJ&hl=en&authuser=1)

Indian Institute of Technology, Delhi

Assistant Professor

May 2020 - March 2023 (2 years 11 months)

New Delhi, Delhi, India

汕头大学

Associate Professor

March 2016 - July 2019 (3 years 5 months)

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## Education

Nanyang Technological University Singapore

Doctoral degree, Mechanical Engineering · (August 2010 - March 2015)