

Mechanical Engineer

Specialization in Lithium-ion Batteries

Davide CLERICI



Summary

Ph.D. in Mechanical Engineering with an extensive experience in lithium-ion batteries. Specialized in multiphysics modeling, advanced testing, degradation analysis and states estimation of lithium ion batteries Eager to leverage the advanced research skills and technical expertise to contribute to the development and optimization of high-performance batteries in a dynamic and innovative industry environment.

Contact

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Languages

Italian: Mother tongue
English: B2

Technical Skills

Multiphysics simulation:
• FEM • Ansys • Comsol
Battery testing:
• Electrical • Thermal
• Mechanical • Vibrational
Material characterization:
• SEM Microscopy
Programming:
• Matlab • Simulink
• LabView • C
Mechanical Design:
• SolidWorks • Catia

Soft Skills

• Communication
• Project Management
• IP protection

Certifications

• IELTS 6.5-B2 English

EDUCATION

11/2020 - 04/2024

PhD in Mechanical Engineering

POLYTECHNIC OF TURIN · Turin, Italy 📍

Thesis: Mechanics of lithium-ion batteries: an experimental and modelling perspective. • Multiphysics modeling of lithium-ion batteries • Electrochemical and mechanical characterization of lithium-ion batteries • Developing a physics-based damage model for lithium-ion batteries • electro-thermo-mechanical battery characterization test • Aging test • Battery material characterization • Health estimation methodologies • State of charge estimation methodologies.

2018-2020

Msc. in Mechanical Engineering

POLYTECHNIC OF TURIN · Turin, Italy 📍

Thesis: Numerical and experimental analysis of ageing mechanism in lithium ion cells.

2015-2018

BSc. in Environmental Engineering

POLYTECHNIC OF TURIN · Turin, Italy 📍

Thesis: Vertical electrical survey on Candia lake.

EXPERIENCE

12/2024-present

Fixed-term assistant professor

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Department of Mechanical and Aerospace Engineering (DIMEAS).

12/2023-12/2024

PostDoc research grant

POLYTECHNIC OF TURIN · Turin, Italy 📍

Impact assessment of Li-Ion Battery Packs for Agricultural applications.

01/2020-10/2020

Short-term research fellow

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Electro-mechanical simulation and dynamic testing of lithium cells

10/2017-10/2018

Student Collaboration - Policumbent student team

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Mechanical design of a recumbent bicycle prototype.

MAIN PUBLICATIONS

- Pistorio F., Clerici D. and Somà, A., "**Diagnostics methodology based on differential mechanical measurements in lithium-ion batteries**", (2025). In: *Applied Energy*.
- Clerici D., Pistorio F., and Somà, A., "**Aging diagnostics in lithium-ion batteries with differential mechanical measurements**", (2025). In: *Applied Energy*.
- Pistorio F., Clerici D., Mocera F. and Somà, A., "**Review on the numerical modeling of fracture in active materials for lithium ion batteries**", (2023). In: *Journal of Power Sources*.
- Clerici D., Mocera F. and Somà, A., "**Electrochemical-mechanical multi-scale model and validation with thickness change measurements in prismatic lithium-ion batteries**", (2022). In: *Journal of Power Sources*.
- Clerici D., Mocera F. and Somà A., "**Analytical solution for coupled diffusion induced stress model for lithium-ion battery**", (2020). In: *Energies*.

CONFERENCES AND PRESENTATIONS

- Presented "**Smart Battery Packs: Diagnostics and Digitalization for Optimized Performance**" at the *IMEchE's EV Batteries Engineering Conference 2024*.
- Presented "**Transport-mechanical model for deformation and stress computation in phase change materials**" at the *Comsol Conference 2023*.
- Presented "**Design and fracture mechanics of electrodes for lithium ion batteries**" at the *7th international conference on structural integrity and durability 2023*, held by the *University of Zagreb*.
- Presented the lecture "**Design modelling and fracture mechanics of lithium ion batteries**" at the *PhD AIAS Summer School 2023*, held by the *University of Ferrara*.
- Presented "**Mechanical characterization and modelling of lithium-ion batteries**" at the *International electric vehicles and battery conference 2022*, held by the *Institution of mechanical engineering - London*.