Harisankar Suresh

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Summary

Experienced Computational Engineer with expertise in Finite Element Analysis (FEA), battery modeling, and data-driven simulations. Proven track record in structural analysis, multi-physics simulations, and machine learning applications for predictive modeling. Proficient in Python, MATLAB, and COMSOL with experience in HPC environments.

Education

•BITS Pilani,Hyderabad Campus *2023*
M.E in Mechanical Engineering CGPA: 8.00

•Amrita School of Engineering, Amritapuri Campus *2021*
BTech in Mechanical Engineering CGPA: 7.62

•Christ Nagar English Higher Secondary School, Kerala *2017*
Higher Secondary Education,Kerala State Board of Education Percentage: 94.5

Experience

•SAR Electric Mobility (Lime.ai) *16/01/2023 - present*
Sr. Engineer Bengaluru

- Developed finite element models to analyze **mechanical stress and strain** in battery structures, optimizing performance and ensuring compliance with industry standards.
- Designed and optimized Kalman filter-based algorithms for SoC estimation in NMC and LMFP chemistries.
- Built scalable data pipelines and analytics frameworks for IoT-based battery data processing.
- Created an internal data library, enhancing data retrieval and processing efficiency.
- Conducted computational fluid dynamics (CFD) and thermal analysis to improve cooling efficiency in battery packs..
- Implemented data-driven predictive modeling to estimate battery aging and degradation using statistical process analysis..
- Led the development of machine learning algorithms for real-time state of health (SoH) prediction and fault detection.

•BITS Pilani, Hyderabad Campus *01/01/2022 - 31/12/2022*
Teaching Assistant Hyderabad

- Conducted lab sessions and developed materials for AI-driven ADAS courses.
- Mentored students in CNN-based image processing, object detection, and segmentation.
- Assisted in TensorFlow and PyTorch implementations for deep learning projects.
- Provided mentorship on feature extraction, transfer learning, and real-time image classification techniques.
- Optimized real-time AI models for embedded edge devices in autonomous systems.
- Provided guidance on feature extraction, transfer learning, and debugging AI-driven solutions.

•Satish Dhawan Space Centre,ISRO *2018*
Intern Sriharikota

- Gained hands-on experience with cryogenic fuel systems, storage, and compressed gas facilities.
- Monitored data operations of cryogenic compressors, pumps, and storage systems.

Projects

•lime internal getter, Lime.ai *01/2023-present*
Developed an internal data handling library, lime internal getter, for streamlined data retrieval at Lime.ai.

- Tools & technologies used: Pandas, NumPy, DB, Requests, REST APIs,Multiprocessing, AsyncIO,Logging module, Exception handling,Version Control: Git
- Developed an internal data handling library for streamlined data retrieval at Lime.ai
- Optimized data access and processing, enhancing efficiency in internal analytics workflows.
- Integrated with IoT pipelines for serial number and IMEI-based retrieval and model testing.
- link for reference lime_internal_getter

•**Finite Element Modeling for Battery Safety, Lime.ai** *08/2023-present*

Performed FEA based simulations for battery health and safety

– Developed multi-physics simulations to assess the impact of mechanical stress and thermal runaway in Li-ion battery packs.
– Modeled anode impedance variations to improve charging current regulation in BMS.
– Used COMSOL and Python for simulation and result validation.

•**Cell Unbalance Prediction, Lime.ai** *03/2024-01/2025*

Developed an LLM-based model for predicting cell unbalance dates with 90% accuracy.

– Tools & technologies used: Python, Scipy, Huggingface, Chronos
– Accomplished model to predict the unbalance date upto 90% accuracy

•**Physics Based Cell Modelling, Lime.ai** *01/2023-present*

Designed a physics-based NMC & LFP cell model for fast simulation and charging pattern analysis.

– Achieved a voltage profile match with experimental data.
– Tools & technologies used: PyBaMM, COMSOL, Python, Scipy, PyGAD

•**Physics Informed Model, Lime.ai**

Developed an algorithm to correct SoH & SoC for BMS. 08/2023-present

– Achieved 2x lower error than competitor models.
– Tools & technologies used:Python, C, Scipy, COMSOL, Git

Technical Skills and Interests

Computational Modeling: Finite Element Analysis (FEA), Finite Volume Method (FVM), Multi-Physics Simulations, Computational Geometry
Programming & Scripting: Python, MATLAB
Data Analysis & Machine Learning: TensorFlow, SciPy, Pandas, NumPy
CAD & Simulation Software: SolidWorks, COMSOL, ANSYS, AutoCAD
High-Performance Computing (HPC): Linux-based HPC Systems, Parallel Computing, Mesh Generation

Achievements

•**Best Performer of the month** *09/10/2023*

Lime.ai
– for outstanding contributions towards modelling algorithms and analysis in July, August and September 2023

•**Value Award AIM & ACT** *01/08/2024*

Lime.ai
– Team award recieved for Cell Algorithm modeling team for developing advanced State of charge prediction algorithm

•**ISVE Best Paper Award** *29/11/2022*

Artifical Intelligence & Deep Learning Section
– 8th International Conference of Nanoelectronics,Computational Intelligence and Communication Systems

Publications

•**Effects of Systemic Error on Localization and Control of Differential Drive Mobile Robot** *18/12/2023*

International Journal of Microsystems and IoT
– Investigated the errors occurring during localization of the robot with Kalman Filter using case studies with ultrasonic sensor readings.
– doi: 10.5281/zenodo.10441392

•**Steady state thermal simulation of high temperature PEM fuel cell with different flow field patterns** *03/06/2024*

AIP Publishing
– A comparison studies of different flow designs for PEM Fuel cells to have optimised performance..
– doi: 10.1063/5.0118593

Soft Skills

Languages: English, Hindi, Malayalam
Soft Skills:Project Management,Leadership, Communication
Areas of Interest: AI, ML, Embedded Algorithms,Data Science,Semiconductor industry

Organizations

–**Intern,** Thanal *2019*

∗ Have Collected details about carbon emissions in Wayanad District,Kerala as a part of Carbon Neutral Project