SARA SAMEER

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RESEARCH INTERESTS

Deep Learning, Model Fusions and Neural Network Architectures for Multivariate Time-Series Analysis, Hybrid Predictive Modeling Approaches with Broad Applications in Interdisciplinary Domains

EDUCATION

National University of Computer and Emerging Sciences **Karachi, Pakistan**
Bachelor of Science in Computer Science [CGPA: 3.66 / 4.00], Cum Laude 08/2019 - 06/2023
Relevant Courses: Programming Fundamentals, Data Structures, Object-Oriented Programming, Operating Systems, Information Processing Techniques, Multivariate Calculus, Probability and Statistics

Harvey Mudd College **Claremont, California**
Summer Exchange Student [Grade: 4.00 /4.00] 06/2021 - 08/2021
Relevant Coursework: MATH189R Mathematics of Big Data

PUBLICATIONS

2025 | GINET: Integrating Sequential and Context-Aware Learning for Battery Capacity Prediction
IEEE Vehicular Technology Conference (VTC)
Sara Sameer, Wei Zhang, Xin Lou, et al.

2024 | Systems for Training a Learning Model to Predict a Cycling Characteristic Via a Physics Model
US Patent Application No. 18/619,815 – Filed on March 28, 2024
Sara Sameer, Constantin-Daniel Nicolae, Nathan Sun, Karena Yan

2024 | Optimizing Cycle Life Prediction of Lithium-ion Batteries via a Physics-Informed Model
Transactions of Machine Learning Research (TMLR), also presented at Joint Mathematics Meetings (JMM)
Sara Sameer, Constantin-Daniel Nicolae, Nathan Sun, Karena Yan

RESEARCH EXPERIENCE

Singapore Institute of Technology **Singapore**
Research Engineer 08/2024 – Present
Supervisor: Dr. Zhang Wei and Dr. Vijay Babu Pamshetti

- Collaborating on the project “Machine Learning-based Battery Performance Management for Rugged Systems in Tropics" (SIT Ignition Grant) to develop temperature-aware battery models using ST Engineering data for reliable performance in Singapore’s tropical climate.
- Optimized transformer-based battery models for edge deployment by applying quantization and sequence windowing, enabling real-time prediction.

University of California, Los Angeles **California**
Research Intern 06/2023 – 08/2023
Supervisor: Dr. Tan Nguyen and Dr. Lingyun Ding

- Worked on a project along with 3 other colleagues to develop a physics-inspired model for accurately measuring the cycle lifetime of a lithium-ion battery.
- Introduced a multi-stage self-attention training scheme that improved cycle life prediction. This enabled comprehensive forecasts of electric charge capacity curves throughout a battery’s entire lifespan, resulting in predictions that outperformed the baseline model by 34%.
- Presented the research findings at University of California, Los Angeles (2023), Toyota Research Institute in San Jose (2023), and Joint Mathematics Meeting (2024) in San Francisco.

TEACHING EXPERIENCE

National University of Computer and Emerging Sciences **Karachi, Pakistan**
Teaching Assistant 09/2021 – 05/2023

- Mentored 40+ students in **Data Structures (Sept 2021–Jan 2022)**, **Probability and Statistics (Sept 2022–Jan 2023)**, and **Numerical Computing (Feb 2023–May 2023)**.
- Increased average assignment scores by 15% through tailored feedback and mentorship.

INDUSTRY EXPERIENCE

Techlogix **Karachi, Pakistan**
Data Scientist 08/2023 – 07/2024
Supervisor: Salman Akhtar, Dr. Qasim Sheikh

- Developed a machine learning model for credit scoring, incorporating custom metrics such as portfolio size and the Kolmogorov-Smirnov (KS) Test to enhance efficiency and improve lending decision-making.
- Collected and validated data from SSMS and Excel. Designed Power BI dashboards to extract customer behavior insights and improved dashboard usability.

HONORS AND AWARDS

- My work on 'Optimizing Cycle Life Prediction of Lithium-ion Batteries via a Physics-Informed Model" has been accepted for a **patent by Toyota Research Institute**.
- Selected for **Research in Industrial Projects (RIPS) 2023**, funded by National Science Foundation (NSF), among 35 other students from 5000+ applicants, with only 12 spots available for non-US students.
- Selected for **Sister2Sister Exchange Program 2022** among 15 other female students from 3000+ applicants from Pakistan to attend a summer semester in a US University.
- Awarded with the **merit cum need based scholarship** for undergraduate studies **from Orange Tree Foundation** and **Sindh Endowment Government** under Higher Education Program Scholarship.
- Recipient **of Dean's List Honor and graduated Cum Laude** for outstanding academic performance in Fall 2019, Spring 2020, Fall 2020, Spring 2021, Spring 2022, Fall 2022 and Spring 2023.

VOLUNTEER AND LEADERSHIP

- Volunteered at Ismaili Civic Singapore, organized and supported wellness initiatives and programs for senior citizens *(Aug 2024 – Present)*.
- Chapter Lead at Association for Computing Machinery's Council on Women in Computing *(2022-23)*.
- Sign Language Interpreter at ConnectHear *(Summer 2020)*
- Member of Pakistan US Alumni Network *(May 2021 - Present)*

SKILLS

Programming Language: Python, C/C++, MATLAB, CUDA
Research Tools: Numpy, Pandas, Matplotlib, Scikit-Learn, Tensorflow, PyTorch, Hugging Face
Other Primitives: Microsoft Power BI, Latex, SQL, Git, Linux, Flask, Fast API

REFRENCES

Dr. Wei Zhang from Singapore Institute of Technology
Associate Professor | wei.zhang@singaporetech.edu.sg
Dr. Susana Serna from University of California, Los Angeles
Professor and RIPS Program Director | sserna@ipam.ucla.edu
Dr. Burhan Khan from National University of Computer and Emerging Sciences, Pakistan
Assistant Professor and Head of Electrical Engineering Department | burhan.khan@nu.edu.pk