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
Under Review at IEEE VTC 2025
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
Joint Mathematics Meetings (JMM), Under Review at TMLR
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 design customized battery models for data provisioned by **ST Engineering**.
- Developed a model fusion architecture combining Informer transformers for battery state estimation, achieving < 1% error rate in SOC/SOH predictions through multi-step time series forecasting.

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 Group**.
- 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 (Since Summer 2021)

SKILLS

Programming Language: Python, C/C++, MATLAB, CUDA
Research Tools: Numpy, Pandas, Matplotlib, Scikit-Learn, Tensorflow, PyTorch, Keras
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