SARA SAMEER

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RESEARCH INTERESTS

Spatio-Temporal Data Mining, Model Fusions for Multivariate Time-Series Analysis, Knowledge-guided ML

EDUCATION

National University of Computer and Emerging Sciences **Karachi, Pakistan**
Bachelor of Science in Computer Science [CGPA: 3.66 / 4.00], Honors, 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

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 physics guided modeling, 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.

PUBLICATIONS AND PATENT

2026 | PACE: Physics-Aware Attentive Temporal Convolutional Network for Battery Health Estimation
ACM Symposium of Applied Computing (SAC)
Sara Sameer, Wei Zhang, Kannan Dhviya, et al.

2025 | Predicting rechargeable battery life using a two-headed autoencoder
US Patent Application No. 18/613,706
Alexander T. Pham, **Sara Sameer**, Constantin-Daniel Nicolae, Nathan Sun, Karena Yan

2025 | Systems for Training a Learning Model to Predict a Cycling Characteristic Via a Physics Model
US Patent Application No. 18/619,815
Alexander T. Pham, **Sara Sameer**, Constantin-Daniel Nicolae, Nathan Sun, Karena Yan

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 | 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)
Constantin-Daniel Nicolae, **Sara Sameer**, Nathan Sun, Karena Yan

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).

INDUSTRY EXPERIENCE

Techlogix — **Karachi, Pakistan**
Data Scientist — 08/2023 – 07/2024
Supervisor: Mr. 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.
- Conducted n-gram analysis on transactional narrative data provided by banks to gain insights into repayment history and borrower behavior, enhancing lending decision-making.

HONORS AND AWARDS

- **Toyota Research Institute Patent Recognition** (2024): My work on 'Optimizing Cycle Life Prediction of Lithium-ion Batteries via a Physics-Informed Model" has been accepted for a patent.
- **Fully Funded Research in Industrial Projects RIPS** (2023): Funded by National Science Foundation (NSF), Selected from 5,000+ global applicants (12 non-US slots available, 0.24% acceptance rate).
- **Fully Funded Sister2Sister Exchange Program** (2022): Chosen among 15 recipients from 3,000+ Pakistani female applicants to attend a summer semester in a US University.
- **Merit-cum-Need-Scholarship** (2019-2023): Orange Tree Foundation and Sindh Endowment Government scholarship recipient (awarded to top 5% of batch students).
- **Dean's List Honor** (2019-2023): Consistent academic excellence across 7 semesters, *Cum Laude* graduation

ACADEMIC SERVICES

Peer review Service:

- Reviewer, IEEE Internet of Things Journal (2024, 2025)
- Reviewer, AAAI Main Conference and NeusymBridge Workshop (2026)

VOLUNTEER AND LEADERSHIP

- Volunteer at Ismaili Civic Singapore, organized wellness 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

Applied AI: Time Series LLMs Fine-Tuning, Edge Deployment
Programming Tools: Python, C/C++, SQL, R
Research Tools: Scikit-Learn, TensorFlow, PyTorch, Hugging Face
Other Primitives: Microsoft Power BI, Latex, SQL, Git, Flask, Fast API