Université Gustave Eiffel

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PHD INTERVIEW

ON

"RISK ASSESSMENT OF ELECTRIC TWO-WHEELERS IN FRANCE USING GENERATIVE AI APPROACHES"

Presented to:
- Université Gustave-eiffel
- Instituto Universitário De Lisboa

Presented by:
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Link for the slides: kaosain.com/ue

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Introduction

Name: Mohammad Kaosain Akbar

Current Role: Junior Data Scientist at Desjardins

Location: Montreal, QC, Canada

Place of Birth: Dhaka, Bangladesh

Research Interests: *Human-Computer Interaction (HCI), Machine Learning, Deep Learning, Data Imputation, System Development, Computational Intelligence*

Introduction

Undergraduate Degree: Bachelor of Science in **Computer Science and Engineering**

Institution: North South University, Dhaka, Bangladesh

GPA: 3.84/4.77 (Summa Cum Laude)

Graduate Degree: Masters of Applied Science in **Systems Engineering**

GPA: 3.77/4.30

Institution: Concordia University, Montreal, QC, Canada

Thesis: Non-intrusive Load Monitoring using Machine and Deep Learning Approaches

Introduction

Timeline	Role	Organization
January 2019 to August 2019	Database Developer (Co-op)	Samsung Electronics Bangladesh
	Undergraduate Teaching Assistant	North South University
September 2019 to December 2020	Lecturer	Daffodil International University
May 2021 to December 2023	Machine Learning Engineer	Applied AI Institute – Concordia University

Publication Record

Mohammad Kaosain Akbar

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Data and Machine Learning Researcher
Verified email at live.concordia.ca

Machine Learning | Deep Learning | Computational Modeling | Data Mining

TITLE	CITED BY	YEAR
Short-term EV load forecasting using Kolmogorov Arnold Networks BM Fahim, MK Akbar, M Amayri 2025 IEEE 34th International Symposium on Industrial Electronics (ISIE), 1-6		2025
GAF-TCN NILM: A Novel Approach to Non-Intrusive Load Monitoring Using Image Analysis with Gramian Angular Field and Temporal Convolutional Networks MK Akbar, M Amayri, N Bouguila 2025 IEEE 34th International Symposium on Industrial Electronics (ISIE), 1-6		2025
ResiDualNet: A novel electric vehicle charging data imputation technique to enhance load forecasting accuracy BM Fahim, MK Akbar, M Amayri Building Simulation, 1-26	4	2025
Evaluation of Two Novel Supervised Non-Intrusive Load Monitoring Techniques MK Akbar, M Amayri, N Bouguila 2024 IEEE 12th International Conference on Smart Energy Grid Engineering …	1	2024
Evaluation of regression models and Bayes-Ensemble Regressor technique for non-intrusive load monitoring MK Akbar, M Amayri, N Bouguila, B Delinchant, F Wurtz Sustainable Energy, Grids and Networks 38, 101294	9	2024
A novel non-intrusive load monitoring technique using semi-supervised deep learning framework for smart grid MK Akbar, M Amayri, N Bouguila Building simulation 17 (3), 441-457	28	2024
Assessing the Effectiveness of Supervised and Semi-supervised NILM Approaches in an Industrial Context MK Akbar, M Amayri, N Bouguila, F Wurtz, B Delinchant Proceedings of the 2023 6th International Conference on Computational …	2	2023
Deep learning based solution for appliance operational state detection and power estimation in non-intrusive load monitoring MK Akbar, M Amayri, N Bouguila International Conference on Industrial, Engineering and Other Applications …	6	2023
Non-Intrusive Load Monitoring using Machine and Deep Learning Techniques MK Akbar Concordia University		2023
Prediction of absenteeism at work using data mining techniques M Skorikov, MA Hussain, MR Khan, MK Akbar, S Momen, N Mohammed, ... 2020 5th International conference on information technology research (ICITR …	17	2020
Mcd-Nilm: A Multi-Scale Clustering and Decoding Approach for Appliance and Ev Energy Disaggregation BM Fahim, MK Akbar, M Amayri Available at SSRN 5377029		

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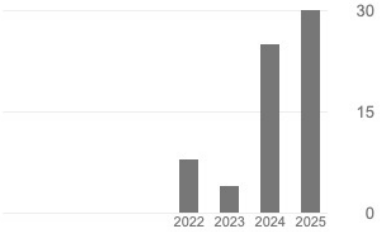

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- Dibya Prokash Sarkar, North Island College

Summary of My Previous Research

- **Non-Intrusive Load Monitoring (NILM):** Developed ML/DL methods to disaggregate energy usage from aggregate signals GAF-TCN NILM.

- **Energy Forecasting:** Proposed advanced regression and imputation methods. Tackled **noisy, missing, and privacy-sensitive data** in real-world contexts.

- **Applications:** Smart grid optimization, demand-side management, EV charging infrastructure.

Why I Am Interested in This PhD

- **Societal impact:** Improving safety of e-bikes & e-scooters aligns with my broader interest in sustainable mobility.
- **Interdisciplinary challenge:** Combines my expertise in AI for time-series & multimodal data with new directions in Generative AI & vision-language models.
- **Research motivation:** Opportunity to apply AI to human-centered safety problems, directly impacting urban transport policy and public well-being.
- **Career fit:** Builds a bridge from my energy/EV background to e-mobility safety, aligning with my long-term goal of becoming an academic researcher in sustainable AI and mobility.

Alignment of My Research with This PhD

- Multimodal Data Handling: My work on energy + contextual signals (NILM, EV load forecasting) parallels the PhD's use of video + sensor + behavioral data.

- Focus on Real-World Noisy Data: Both domains require methods that are robust, interpretable, and scalable for practical deployment.

- E-Mobility Connection: Already contributed to EV charging analytics; now extending to safe operation of e-scooters/bikes, broadening my impact in the e-mobility ecosystem.

Tentative PhD Plan

- **Year 1** – Familiarization with datasets, literature review, baseline models for scene understanding.
- **Year 2** – Develop generative AI methods to detect and describe critical events; integrate multimodal data.
- **Year 3** – Validate models against annotated events, refine risk detection framework, publish results, contribute to safety tools for e-mobility.

Tentative Career Plan

- **Short-Term (Post-PhD):**
  – Continue research in Generative AI & transport safety.
  – Pursue a postdoctoral fellowship in the same domain.
  – Expand international collaborations and publish in top venues.

- **Long-Term:**
  – Become a professor in academia, leading research on AI for mobility & safety.
  – Supervise PhD students and build an interdisciplinary lab.
  – Contribute to policy, standards, and safer urban mobility through academic research.

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Thank You