

PRESENTED TO:  
PROFESSOR MAHMOUD ALFADEL

PRESENTED BY:  
MOHAMMAD KAOSAIN AKBAR



UNIVERSITY OF  
**CALGARY**

INTRODUCTORY PRESENTATION FOR PHD IN COMPUTER SCIENCE

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# Introduction

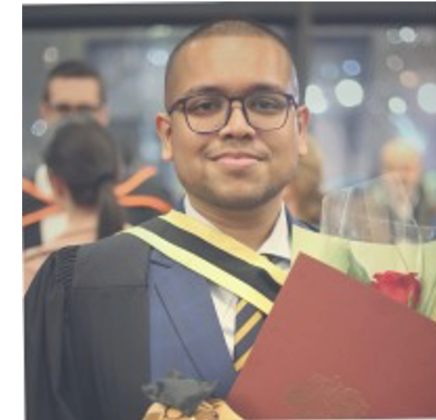
**Name:** Mohammad Kaosain Akbar

**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

Data and Machine Learning Researcher

Verified email at live.concordia.ca

Machine Learning Deep Learning Computational Modeling Data Mining

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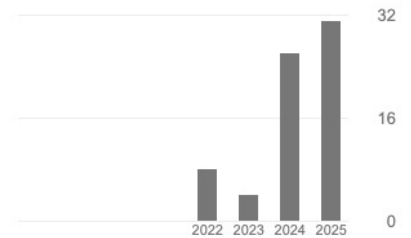
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TITLE	CITED BY	YEAR
<a href="#">A novel non-intrusive load monitoring technique using semi-supervised deep learning framework for smart grid</a> MK Akbar, M Amayri, N Bouguila Building simulation 17 (3), 441-457	29	2024
<a href="#">Prediction of absenteeism at work using data mining techniques</a> M Skorikov, MA Hussain, MR Khan, MK Akbar, S Momen, N Mohammed, ... 2020 5th International conference on information technology research (ICITR ...	17	2020
<a href="#">Evaluation of regression models and Bayes-Ensemble Regressor technique for non-intrusive load monitoring</a> MK Akbar, M Amayri, N Bouguila, B Delinchant, F Wurtz Sustainable Energy, Grids and Networks 38, 101294	9	2024
<a href="#">Deep learning based solution for appliance operational state detection and power estimation in non-intrusive load monitoring</a> MK Akbar, M Amayri, N Bouguila International Conference on Industrial, Engineering and Other Applications ...	6	2023
<a href="#">ResiDualNet: A novel electric vehicle charging data imputation technique to enhance load forecasting accuracy</a> BM Fahim, MK Akbar, M Amayri Building Simulation, 1-26	4	2025
<a href="#">Assessing the Effectiveness of Supervised and Semi-supervised NILM Approaches in an Industrial Context</a> MK Akbar, M Amayri, N Bouguila, F Wurtz, B Delinchant Proceedings of the 2023 6th International Conference on Computational ...	3	2023
<a href="#">Evaluation of Two Novel Supervised Non-Intrusive Load Monitoring Techniques</a> MK Akbar, M Amayri, N Bouguila 2024 IEEE 12th International Conference on Smart Energy Grid Engineering ...	1	2024
<a href="#">Short-term EV load forecasting using Kolmogorov Arnold Networks</a> BM Fahim, MK Akbar, M Amayri 2025 IEEE 34th International Symposium on Industrial Electronics (ISIE), 1-6		2025
<a href="#">GAF-TCN NILM: A Novel Approach to Non-Intrusive Load Monitoring Using Image Analysis with Gramian Angular Field and Temporal Convolutional Networks</a> MK Akbar, M Amayri, N Bouguila 2025 IEEE 34th International Symposium on Industrial Electronics (ISIE), 1-6		2025
<a href="#">Non-Intrusive Load Monitoring using Machine and Deep Learning Techniques</a> MK Akbar Concordia University		2023
<a href="#">Mcd-Nilm: A Multi-Scale Clustering and Decoding Approach for Appliance and Ev Energy Disaggregation</a> BM Fahim, MK Akbar, M Amayri Available at SSRN 5377029		

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# 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.

# Alignment of My Experience with your Research

- My MASc research focused on **time series modeling, imputation, and anomaly detection**.
- Developed models robust to **noisy and incomplete sequential data**.
- Published multiple works on **EV load forecasting** and **NILM** methods.
- These align with your interests in **robust ML, sequential data, and applied machine learning for real-world impact**



# Research Topic of Interest

- Robust machine learning for **sequential and structured data**.
- Methods for **learning from incomplete, noisy, or distributed data**.
- Explainability and interpretability in ML models for decision-making.
- Exploring new frontiers in **healthcare analytics, signal processing, or complex systems** under your guidance

# Tentative PhD Plan

## Year 1–2:

- Deep dive into theoretical foundations of robust ML and sequential modeling
- Replicate and extend existing work in your group to gain hands-on alignment

## Year 2–3:

- Propose novel methods for robust learning from noisy and incomplete data
- Apply to one or two real-world datasets (healthcare, energy, or social systems)

## Year 3–4:

- Advance towards publishing in **NeurIPS, ICML, ICLR**
- Build transferable frameworks for sequential data robustness
- Complete dissertation integrating theoretical and applied contributions

# Tentative Career Plan

- Short-term: Contribute to impactful publications and collaborative projects under your supervision
- Medium-term: Pursue **postdoctoral research** to further deepen expertise in robust ML and sequential data
- Long-term: Become a **professor and lead a research group**, focusing on **trustworthy AI and human-centered ML**

# Thank You

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