

PRESENTED TO:  
PROFESSOR KAMIVANIEA

PRESENTED BY:  
MOHAMMAD KAOSAIN AKBAR



UNIVERSITY OF  
**WATERLOO**

INTRODUCTORY PRESENTATION FOR PHD IN ELECTRICAL AND  
COMPUTER ENGINEERING

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Link for the slides: [kaosain.com/uw](https://kaosain.com/uw)

# 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



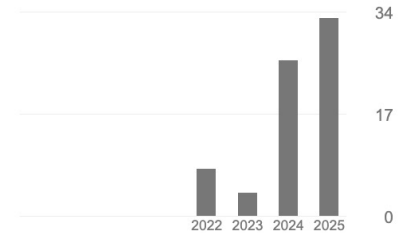
TITLE	CITED BY	YEAR
<a href="#">A novel non-intrusive load monitoring technique using semi-supervised deep learning framework for smart grid</a> MK Akbar, M Amayri, N Bouguila Building simulation 17 (3), 441-457	30	2024
<a href="#">Prediction of absenteeism at work using data mining techniques</a> M 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	10	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

- Conducted research on Non Intrusive Load Monitoring using deep learning models such as CNN, BiLSTM and TCN for energy disaggregation
- Developed ResiDualNet, a residual BiLSTM CNN model for missing data imputation in electric vehicle charging datasets that improved forecasting accuracy
- Designed Bayesian Ensemble Regressor and other regression models for appliance level power estimation and anomaly detection
- Created GAF TCN based framework that integrates temporal encoding for better state detection and interpretability
- Completed undergraduate capstone titled “I Am Here,” a user centered and privacy preserving security service for emergency support

# Why I Am Interested to do PhD in this domain

- I am fascinated by how people understand and interact with technology, especially in situations that involve security and privacy decisions.
- I am interested to explore how artificial intelligence may support, but never replace, human judgment various privacy-based scenarios.
- Working in this area would allow me to contribute to building technologies that respect human values, empower users, and strengthen digital trust globally.



# Alignment of My Experience

- My work on energy data and NILM systems has made me aware of how technical systems can unintentionally affect user privacy and trust.
- I value the idea of designing systems that communicate clearly with users instead of hiding decisions behind technical complexity.
- My background in AI and system design gives me a foundation to study how advanced technologies can be integrated into everyday life responsibly.

# Tentative Career Plan

- Short-term: Contribute to impactful publications and collaborative projects under your supervision.
- Medium-term: Continue as a postdoctoral researcher or research scientist, leading projects that apply HCI principles to real world security systems.
- Long-term: Become a professor and establish my own research group focused on designing usable, trustworthy, and inclusive security technologies.

# Thank You

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