

Fahad Rahman Amik

Email: fahad.amik@mail.mcgill.ca | Mobile: +1 438 699 9630



EDUCATION

- Mila - Quebec AI Institute and McGill University** Montreal, Canada
 - PhD Student in Electrical & Computer Engineering* *Jan. 2023 - Present*
 - Topic:** Machine Learning for Electronic Design Automation
 - Supervisor:** Prof. Boris Vaisband
 - Co-Supervisor:** Prof. Warren Gross
- North South University** Dhaka, Bangladesh
 - Bachelor of Science in Computer Science & Engineering, CGPA: 3.79/4.00* *May. 2017 - April. 2021*
 - More than **90%** marks on average
 - Specialization Courses:** Deep Learning, Machine Learning, Data Communication & Network

RESEARCH INTERESTS

Graph representation learning, LLM-conditioned optimization policies, reinforcement learning for design-space exploration, timing analysis, physical design, and ML for electronic design automation.

PUBLICATIONS & PREPRINTS

- Amik, F.R.**; Safari, Y.; Zhang, Z.; Vaisband, B.. "Graph-Based Timing Prediction at Early-Stage RTL Using Large Language Model". *Asia and South Pacific Design Automation Conference (ASPDAC)*, 2025.
- Safari, Y.; Corbier, A.; Saleh, D.A.; **Amik, F.R.**; Vaisband, B.. "Thermal Simulator for Advanced Packaging and Chiplet-Based Systems". *IEEE Transactions on Very Large Scale Integration (VLSI) Systems*, 2025 (**TVLSI**)
- Penmetta, S.; **Amik, F.R.**; Zhang, Z.; et al.. "Generalizable and Relation Sensitive Netlist Representation for Analog Circuit Design". *34th Great Lakes Symposium on VLSI (GLSVLSI)*, 2024.
- Al Saleh, D.; Safari, Y.; **Amik, F.R.**; Vaisband, B.. "P* Admissible Thermal-Aware Matrix Floorplanner for 3D ICs". *IEEE 36th International System-on-Chip Conference (SOCC)*, 2023.
- Amik, F.R.**; Lanard, A.; Ismat, A.; Momen, S.. "Application of Machine Learning Techniques to Predict the Price of Pre-Owned Cars in Bangladesh". *Information Journal*, 2021
- Amik, F.R.**; Tasin, A.; Ahmed, S.; Elahi, M; Mohammed, N.. "Dynamic Rectification Knowledge Distillation". *arXiv preprint*, 2022

TEACHING EXPERIENCE

- McGill University** Montreal, Canada
 - Graduate Teaching Assistant* *Sep. 2023 - Present*
 - Courses Assisted:** CCCS 321: Operating Systems Administration, COMP 535: Computer Networks, COMP 208: Computer Programming for Physical Sciences and Engineering.
- North South University** Dhaka, Bangladesh
 - Graduate Teaching Assistant* *Jan. 2021 - April 2022*
 - Courses Assisted:** CSE 115: Introduction to computer programming, CSE 425: Concepts of Programming Language, CSE 438: Data Communication & Network.

INDUSTRY EXPERIENCE

- Huawei Technologies Canada Co., Ltd.** Montreal, Canada
 - Associate ML Researcher, Intern* *Dec. 2024 - June. 2025*
 - Research Area : Graph Representation Learning for Performance Prediction
- Huawei Technologies Canada Co., Ltd.** Montreal, Canada
 - Associate ML Researcher, Intern* *May. 2023 - Oct. 2023*
 - Research Area : Reinforcement Learning and Graph Neural Networks for Analog Transistor Sizing
- Hilinkz Ltd.** Dhaka, Bangladesh
 - Chief Executive Officer* *Feb. 2021 - Dec. 2022*
 - Led the team and managed projects
 - Designed system architecture & database
 - Developed scalable and adaptable web applications using Laravel and React.js and created RESTful APIs for mobile applications
- HURU Technologies Ltd.** Dhaka, Bangladesh
 - Software Engineer Intern* *Oct. 2020 - Jan. 2021*
 - Developed a web app for a Digital Service Hiring Solution using Laravel for the backend and admin panel, and jQuery for the frontend
 - Built Restful API's for the Flutter app

ACHIEVEMENTS

- **DATE Young Fellow** — Design Automation Test Europe (DATE) *April 2026*
- **DAC Young Fellow** — Design Automation Conference (DAC) *June 2025*
- **MEDA Award** - McGill Engineering Doctoral Award *January 2023*
- Achieved **50% merit-based tuition waiver** in the admission of North South University, Bangladesh *April 2017*

SELECTED PROJECTS

- **Graph-Conditioned LLM Policy for Constrained Sequential Optimization:**
 - Built a graph-conditioned SFT pipeline that converts AIG circuits into DeepGate2 structural/functional embeddings, projects them into Qwen soft tokens, and fine-tunes the policy with LoRA over a fixed 55-step action space.
 - Designed rulebook-backed constrained decoding with legality masks shared across dataset validation, teacher-forced training, scheduled sampling, and inference, preventing invalid action sequences by construction.
 - Implemented data-quality and evaluation controls including leakage-resistant splits by design suffix, duplicate/conflict rejection, cache verification, held-out validation, decode-based metrics, and graph-conditioning ablations.
 - Extended the SFT policy design into a shared-backbone actor-critic framework for PPO, using terminal post-placement PPA reward while keeping expensive environment evaluation separated behind a configurable reward interface.
 - **Technology:** Python, PyTorch, HuggingFace, Qwen, LoRA, DeepGate2, PPO, constrained decoding.
- **Graph-Based Timing Prediction at Early-Stage RTL Using Large Language Models:**
 - Developed an RTL dataset generator to produce thousands of synthetic circuits, creating a diverse graph dataset.
 - Converted gate-level Verilog into a DAG capable of handling **millions of nodes** and utilized LLemma-7B to generate node and graph-level embeddings from technology files, which were in a mathematical format.
 - Implemented a GAT to enhance graph representation, leveraging graph-level features after global mean pooling and before passing them to the linear layer.
- **Generalizable and Relation Sensitive Netlist Representation for Analog Circuit Design:**
 - Proposed a novel heterogeneous graph representation for analog circuits.
 - An embedding lookup table for each component type in the circuit with weights learned through backpropagation.
 - Introduced a novel RL reward method to optimize the unmet metric when other metrics are met.
 - Solved the sample inefficiency issue, providing better generalization and enhanced knowledge transferability across different specifications and circuit topologies, and outstanding performance in zero-shot settings without further training.
- **RFID Based Smart Print Zone for NSU:**
 - Acquired by NSU for **2 million BDT**.
 - Designed and developed an RFID-compatible printing system for centralized print zones to handle client requests.
 - Enabled users to print documents from home, offering a cost-effective alternative to conventional printing solutions.
 - Actively used by more than **30,000** students and faculty members at NSU.
 - **Technology:** PHP 7.4, Laravel 8, jQuery, MySQL.

TECHNICAL SKILLS

- **Programming Languages:** Python, C++, JavaScript, PHP
- **Machine Learning and AI:** PyTorch, Hugging Face, scikit-learn, NumPy, LoRA fine-tuning, LLMs, GNNs, reinforcement learning, PPO, constrained decoding
- **Data, Evaluation, and Visualization:** PostgreSQL, MySQL, dataset validation, train/validation/test splitting, ablation studies, Matplotlib, Seaborn
- **Software Engineering:** Git, Docker, React, Laravel, RESTful APIs, Linux, AWS Lightsail, Heroku
- **EDA and CAD Tools:** Cadence Tempus, Cadence Genus, Synopsys PrimeTime, OpenROAD Flow, Yosys, ABC/ABC9
- **Collaboration:** GitHub-based development, Trello, Slack, technical documentation

CERTIFICATIONS

- **Deep Learning with Pytorch: Build a Neural Network** *Issued*
Issued by: *deeplearning.ai*. *Certification URL*.

EXTRA-CURRICULAR ACTIVITIES

- **General Executive of Compete McGill Club, McGill University:**
Lead and manage the university's premier programming club, overseeing activities, programming contests, and collaborative projects to enhance software development skills among students.