

MD Sadman Kabir

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EDUCATION

SUNY UNIVERSITY AT BUFFALO

Expected 2027

Master of Science: **Electrical Engineering**

BOSTON UNIVERSITY

May 2025

Bachelor of Science: **Computer Engineering**

Concentration: **Machine Learning**

Relevant Coursework: Deep Learning, Signals and Systems, Logic Design, Computer Organization, Electric Circuits.

EXPERIENCE

Research Intern

Sept 2024 – Aug 2025

Boston University, China Historical Christian Database

- Served as backend technical intern migrating backend of academic database from Neo4j to PostgreSQL.
- Rewrote legacy queries from Cypher/Neo4j to PostgreSQL, integrating into React frontend ensuring full-stack reliability.
- Developed Express.js RESTful API to improve maintainability and backend accessibility.
- Worked closely with project manager and team to safely build upon codebase architecture.
- Validated accuracy and precision of modular queries and authored complex queries for large-scale requests.

Software Engineering Instructor

May 2023 – Aug 2023

Giant Machines Software

- Mentored and instructed externs and fellows representing Citadel Securities, Bank of America, and Mastercard.
- Delivered lectures on Python and web development using HTML, CSS, Flask, Bootstrap, and cloud databases.
- Taught interview preparation, algorithms, data structures, and core computer science concepts.

PROJECTS

Semi-Autonomous Robotic Ground Convoy

Capstone Project — Boston University & Charles Stark Draper Laboratory

- Co-led the robotic perception team responsible for real-time detection and tracking of field targets.
- Developed ROS2 perception modules implementing SLAM for obstacle avoidance and autonomous navigation.
- Achieved less than 8% convergence in validation loss for object detection enabling accurate real-time targeting.
- Retrained YOLO models using transfer learning on a custom annotated dataset expanded with data augmentation.

Songbird: Generative Transformer Model for Blues and Jazz Composition

- Architected a 19M parameter transformer-based sequence model using TensorFlow and PyTorch with a team of three.
- Applied optimization and regularization techniques to improve training efficiency and reduce overfitting.
- Benchmarked model performance using cross-entropy loss, perplexity, and top-k accuracy to validate training outcomes.
- Implemented Monte Carlo reinforcement learning using REINFORCE algorithm.
- Accelerated training using CUDA and high-performance computing clusters.

MAINLINE: A parallelized personal pipeline for post-training language models.

- Built a multithreaded web-crawler to source raw web text for post-training a 1.7B-parameter causal LM into a personalized instruct-style chatbot.
- Designed a parallelized data-labeling stage using a local LLM to convert page content into ChatML-formatted, multi-turn instruction data.
- Curated a 30K-sample dataset and carefully conducted a full-parameter fine tune of SmolLM2 1.7B into instruct model.
- Specialized the model into a personalized chatbot, after a second-stage LoRA fine-tune, with context of 8,192 tokens.

FPGA Implementation of Two-Player Board Game

- Designed and implemented a strategy game on FPGA using Verilog RTL design.
- Developed firmware controlling 7-segment displays, push buttons, and toggle switches.
- Achieved 100% test pass rate through simulation and hardware validation in Xilinx Vivado.

RISC 5-Stage Pipelined CPU

- Built a complete 5-stage (IF, ID, EX, MEM, WB) pipelined RISC CPU in Verilog.
- Implemented datapath, control logic, hazard detection, and forwarding units.
- Developed comprehensive testbenches from module-level to full system integration.

SKILLS

Programming / Hardware: C, C++, C#, Java, Verilog, Assembly, Python, Lua, JavaScript, TypeScript, Git, MATLAB

Machine Learning: TensorFlow, PyTorch, Scikit-learn, Hugging Face, Pandas, NumPy, OpenCV, Claude, Jupyter, CUDA

Embedded Systems: ROS2, Linux, Driver Development, RTOS, Multithreading, PCB Design, KiCad

Web Development: Node.js, Express.js, MongoDB, PostgreSQL, SQLite, Bootstrap, React Native, Electron