Arunabha Ghosh

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Education

McMaster University — **Expected Graduation April 2027**
Bachelor of Engineering in Electrical Engineering (B.Eng.) — *Hamilton, Ontario*

Relevant Coursework:

- Logic Design
- Circuits and Systems
- Principles of Programming
- Microprocessors Systems
- Data Structures and Algorithms
- Electronic Circuits and Devices

Experience

McMaster University — **September 2024 – April 2025**
Campus Store Retail Associate — *Hamilton, Ontario*

- Assisted with merchandise organization, inventory restocking, and seasonal displays
- Collaborated with a team of associates to manage daily operations and maintain store cleanliness and organization
- Handled customer inquiries and resolved issues related to product availability, online orders, and returns with professionalism and efficiency

City of Brampton — **February 2023 – November 2023**
STEM Instructor — *Brampton, Ontario*

- Mentored 25 students weekly about engineering principles and values through interactive learning modules
- Facilitated critical thinking skills through hands-on activities such as robotics, coding, and circuit design
- Coordinated closely with 5 other instructors to ensure students with a welcoming environment that helps foster innovation, teamwork, and creativity

Kumon — **September 2022 – February 2023**
Center Assistant / Tutor — *Brampton, Ontario*

- Tutored 100 different students 1 on 1, in person and virtually about subjects such as Math and English
- Developed a welcoming and supportive environment where students feel comfortable and encouraged to ask questions and actively participate
- Optimized staff and tutoring schedules, increasing efficiency and accommodating 3 extra students daily without any compromise
- Analyzed progress for 20 students bi-weekly to provide detailed feedback to parents, resulting in a score increase of 30%

Projects

3D LiDAR Scanner | *C, Python, Assembly, Open3D, AD3* — **April 2025**

- Engineered an embedded system capable of 3D spatial mapping a using a **TI-MSP432E401Y microcontroller**, **VL53L1X Time-of-Flight sensor**, and **28BYJ-48 stepper motor**
- Programmed in **C** and **Assembly**, transmitted real-time data from the sensor to the MCU via **I2C**, then via **UART** to a Python-based visualization script
- Rendered **interactive 3D point clouds** using **Open3D** and visualized scanned environments with accurate spatial depth

CMOS XOR Gate | *MOSFETS, Digital Logic, AD3, Circuit Design, Breadboard, LTSpice* — **March 2025**

- Protyped a **CMOS XOR logic gate** using discrete **NMOS** & **PMOS** transistors from CD4007B ICs
- Verified functionality using **logic analyzers** and static/dynamic waveform tests with the **AD3**
- Measured rise/fall times and propagation delay to **validate signal integrity** and response time
- Validated gate logic through voltage-level and timing analysis, ensuring correct XOR behavior and level transition

Snake Game | *C, C++, OOD, GitHub, Visual Studio* — **December 2024**

- Designed a modular snake game in **C++** using **object-oriented design principles**, including encapsulation, inheritance, and polymorphism, to create reusable and maintainable code
- Developed advanced gameplay mechanics with multiple special food spawning and generation, border wrap-around and collision detection
- Applied **dynamic memory allocation** management and structured programming to ensure efficient, and reliable functionality with **no memory leakage**

Technical Skills & Certificates

Languages: Python, C/C++, Assembly, HTML/CSS, Java, JavaScript, Verilog, VHDL, MATLAB, R
Developer Tools: Visual Studio, PSpice, GitHub, Quartus, Microsoft Office, Autodesk Suite, LTSpice
Equipment: Arduino, Raspberry Pi, PCB, Wave Generator, Oscilloscope, Analog Discovery 3 (AD3)
Certificates: Standard First Aid/CPR-C/AED, Worker Health and Safety Certification, WHMIS, High Five PHCD