

# Akash W Shah

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<https://github.com/awskies>

## Education

**McGill University, Honours Physics and Computer Science**, Montréal, Québec **2023 – Present**  
**GPA:** 3.87, on a 4.0 scale

**Sharon High School**, Sharon, Massachusetts  
**GPA:** 6.0, on a weighted 6.0 scale

**2019 – 2023**

## Honors

Trottier Space Institute Summer Undergraduate Award Honourable Mention (university, top 10%)  
Summa Cum Laude (high school)  
Excellence in Physics Award (high school)  
Honor Roll (all semesters of high school)  
AP Computer Science A Exam Perfect Score (high school, 0.47% of test takers globally)

## Membership & Experience

**Black Hole Research, McGill University** **May – August 2025**  
Received a Summer Undergraduate Research Award from the Physics Department for a project with Prof. Daryl Haggard and Dr. Sophia Waddell. With a research partner, used NASA's XSPEC software for X-ray spectroscopy of the active galactic nucleus MCG+04-22-042 to study and model the parameters of its corona. Produced figures for and co-authored a paper on the findings.

**McGill Rocket Team** **Payload Software Lead: July 2024 – August 2025**  
**Avionics Software Member: September 2023 – March 2024**  
Programmer for the McGill Rocket Team. Wrote embedded systems code for custom flight computers utilizing the STM32 microcontroller in C and C++. Wrote drivers for SD card, accelerometer, CAN bus, and other peripherals. As the Payload Software Lead, led and trained a team of 5–7 people in writing code for high-speed data acquisition (DAQ) and analysis and developing an active temperature control system using thermoelectric coolers. Designed overall code structure. Attended the [Launch Canada Challenge](#) with the team in August 2025.

**Software Development Internship, Boardwalktech** **Summer 2024**  
Remote intern; worked on [Unity Central](#), a productivity tool for the shipping industry. Researched and developed a system for finding keywords in a corpus of documents of varying type and format and searching for them using the Ripple search engine. Involved natural language processing with latent semantic analysis.

**FIRST Tech Challenge (FTC), Team Unlimited** **Captain: Spring 2022 – Spring 2023**  
**Member: Spring 2019 – Spring 2022**  
Captain of an FTC high school robotics competition team. Ranked second in Massachusetts in 2022–2023 season. In previous years, was software lead and a member. Involved a commitment of 7–20 hours per week throughout the year. Qualified for state competition every year. Programmed remote control and autonomous functionality in Java, involving control theory, PIDF loops, and finite state machines. Used Computer Aided Design (CAD) to model parts and assemblies with SOLIDWORKS. Machined and assembled parts using tools such as a bandsaw, drill, Dremel, and drill press. As captain, led a team of 10–15 people in multiple areas, including

scheduling and coordinating work and collaboration between multiple subteams, coordinating public outreach events, and training new members in hardware, software, CAD, documentation, and outreach.

**Sharon High School CyberPatriot Team**

**2021 – 2023**

Ranked first in state both years in CyberPatriot, a competition organized by the Air Force Association to identify and fix security issues and viruses and to complete various cyber and cryptographic challenges in multiple operating systems. Coded scripts in Batch to automate the process. Specialized in Windows 10 and Server 2019 operating systems. Reached Platinum Tier in state round in 2021-2022 season. Reached Platinum (highest) Tier in National Semifinals in 2022-2023 season.

**Robotics Class Teacher Volunteer, *Immigrant Family Services Institute* Summers 2019 – 2022**

Designed curriculums for 5-week classes “LEGO Robotics with Mindstorms” and “Programming in Python” for children aged 8–15 years, whose families recently immigrated from Haiti. Taught these classes in-person and remotely for group sizes of 5–15 students.

## Projects

**Erosion Simulator (McGill Physics Hackathon)**

**November 2024**

The McGill Physics Hackathon is a two-day event where teams make a program to solve physics problems. In a team of five, created a Python program which uses a basic fluid simulation to determine where to erode a river over time. Used NumPy for simulation purposes and a marching cubes algorithm and Matplotlib for the visualization animation.

**Gravitational Lensing Simulator (McGill Physics Hackathon)**

**November 2023**

With a partner, created a Python program to render what a picture would look like in the presence of a large mass with a large gravitational field. Used NumPy to simulate the path of light through space.

**Game Development**

**Winter 2020 – Present**

Taught myself Unity3D Game Engine development; worked on multiple games in my free time. Participated in three game jams, events where teams are challenged to create a game based on a theme in a limited time. Designed and implemented “Protista”, a newly invented abstract board game that can be loosely described as complexity theory in a competitive form; exercised coding, graphics, algorithms, 3D modeling and animation, and user interface skills.

**Uno Bot (Machine Learning)**

**Spring 2022**

Wrote an algorithm to play the card game “Uno” and used a genetic algorithm to tune its parameters.

**Discord Bot Development**

**2017 – 2021**

Designed and programmed a Discord bot that allowed users on a chat service to play a text-based game and compete with other users. Completed initial development in middle school and continued to add features through junior year of high school. More than 100 different groups have chosen to add this bot to their servers.

## Proficiencies

### Languages

**Python:** Used for many personal projects, scripts, and scientific analysis. *Extensive experience.*

**C & C++:** Wrote embedded systems code and drivers for rocket flight computers; took university course. *Extensive experience.*

**C#:** Programmed many games in **Unity3D**. *Extensive experience.*

**Java:** Wrote code to control robots; wrote machine learning algorithm to play Uno; took high school and university courses. *Extensive experience.*

**Bash:** Used often for interacting with the **Linux** operating system; wrote scripts for various projects; took university course. *Extensive experience.*

**JavaScript & TypeScript:** Wrote for simple interactive websites, with both plain JS and React framework. *Moderate experience.*

**HTML and CSS:** Built website. *Moderate experience.*

**MATLAB:** Took university course. *Moderate experience.*

**Batch:** Wrote scripts to fix insecurities in Windows 10 and Server 2019 operating systems as part of the CyberPatriot competition. *Moderate experience.*

### Software

**Git (Version Control System):** Used to manage versions for every programming project. *Extensive experience.*

**XSPEC (X-ray Spectroscopy):** Analyzed X-ray spectra of an active galactic nucleus from various telescopes including XMM-Newton, Swift, and Suzaku. *Extensive experience.*

**Unity3D (Game Engine):** Developed “Protista” game and other projects. *Extensive experience.*

**SOLIDWORKS (CAD):** Designed parts and assemblies for mechanisms for robots; modeled miscellaneous parts for 3D printing. *Extensive experience.*

**GIMP 2 (Image Editing):** Edited images for a variety of projects. *Extensive experience.*

**Autodesk Maya (3D Modeling & Animation):** Modeled and created animations for robots to demonstrate functionality; modeled and created animations for game objects. *Moderate experience.*

**DaVinci Resolve (Video Editing):** Edited and created videos for a variety of purposes. *Moderate experience.*

**Adobe Lightroom (Photo Editing):** Touched up and edited photos for digital photography courses. *Moderate experience.*