

# Arshdeep Singh Karwal

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## SUMMARY

Passionate Computer Engineering student with experience in developing solutions using microcontrollers with expertise in programming languages such as Python, Java and C++. A solid foundation in front-end web development and digital systems design with hardware-software integration using FPGAs and Verilog HDL.

## EDUCATION

### University of Manitoba

B.Sc. Computer Engineering (Co-op/IIP); GPA: 4.2/4.5

Expected Graduation: April 2029

Winnipeg, MB

- **Awards:** UM Queen Elizabeth II Scholarship - Tier 1, President's Scholarship and John F. Pink Scholarship.
- **Relevant Course Work:** Engineering Design and Communication, Analysis of Electrical Circuits and Digital Systems, Multivariable Calculus, Differential Equations, and Introductory Thermodynamics and Mechanics.

## ENGINEERING PROJECTS

### Live Video Surveillance Alarm System

- Implemented a model of real-time video processing on a DE10-Standard FPGA from a raw analog video camera input. Integrated SDRAM frame buffering, and YCbCr to RGB color space conversion for 640x480 VGA output.
- Developed a low-latency surveillance system utilizing parallel processing to synchronize RCA video feed with peripheral inputs such as IR break-beam sensors, an active buzzer for intrusion detection, and a passcode security unit implemented through hardware switches.

### Portfolio Website

- Developed a portfolio website to showcase my experience, projects and skills using HTML, CSS, and JavaScript.
- Designed to be responsive so the elements change based on the viewing device. Cohesively uses various elements such as links, buttons, forms, and tab-panels to create a professional website.

### Automated Waste Sorting System

- Developed a fully automated waste sorting system using an Arduino UNO and various motors and sensors.
- Created a functional program in the Arduino IDE using C++ through debugging and timing the motors and sensors cohesively.

## WORK EXPERIENCE

### Security Professional

Allied Universal

June 2025 – Present

Winnipeg, MB

- Ensured campus safety and security in a downtown university environment. Responsibilities included conducting extensive multi-building patrols, managing alarm systems, and CCTV surveillance.
- Maintained rigorous daily activity logs and incident reports, ensuring 100% accuracy in data recording. Successfully de-escalated and managed numerous incidents, including medical emergencies and situations involving intoxicated individuals.

### Security Officer

IATSE LOCAL 856

June 2025 – Present

Winnipeg, MB

- Ensured the safety of crucial filming equipment and props on a professional movie set. Proactively monitored the perimeter and secured all valuable assets, consistently performing night shifts to maintain continuous supervision.

## PROFESSIONAL SKILLS

### Teamwork

- Maintained constant communication and collaborated with a team of 5 engineering students through two major projects. Contributed to the team by providing proposed design sketches that met all technical specifications.

### Project Management

- Consulted with an external client to propose an Automated Waste Sorting System to improve waste collection and contamination on the University of Manitoba Campus using organized internal deadlines to meet team deliverables.

### Technical Skills

- **Programming & Web Design:** Python, Java, C++, JavaScript, Verilog HDL, MATLAB, HTML, CSS, LaTeX.
- **Software & Tools:** VS Code, Quartus Prime, LTspice, AutoCAD, Microsoft Office, Adobe Creative Cloud.

**Licenses:** Class 4A, 6M Driver's License, Security Guard License.

## MEMBERSHIPS

Engineers Geoscientists Manitoba - Student Member

Oct 2025 – Present