Mohamed Mahmoud

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Montreal, Canada (Relocate Possible)   **GitHub** https://github.com/MohamedAlKayd   **Canadian Citizen (J1/TN Visa Possible)**

🎓 Education

Bachelors Degree, Major in Software Engineering • Montreal, Quebec, Canada • April 2023 (Expected)

Double Minor: Computer Science & Economics.

McGill University Entrance Scholarship: McGill University Hugh Brock Scholarship: $3,000.00.

McGill University Internship Award: McGill University Undergraduate Internship Award: $4,000.00.

Tomlinson Project in University-Level Science Education (T-Pulse) Award: Tomlinson Engagement Award for Mentoring (TEAM): $750.00.

SAT: Evidence-Based Reading and Writing Test: Score: 730/800 (99th Percentile). **SAT: Math Subjects Test**: Score: 730/800 (98th Percentile).

Relevant Coursework: Programming Fundamentals, Software Systems, Data Structures & Algorithms 1 & 2, Computer Systems, Programming Languages and Paradigms, Software Design, Web Development, Computer Systems Graphics Cards Lab, Operating Systems, Competitive Programming Challenges, C++ Lab, Undergraduate Research Project, Project in Computer Science, Robotics and Intelligent Systems, Database Systems, Artificial Intelligence, Independent Studies in Computer Science, Applied Machine Learning, Discrete Structures, Linear Algebra 1 & 2, Calculus 1 & 2, Statistics, Mechanics, Electromagnetism.

🔬 Research

Robot Control System Research Project   May 2022 – August 2022

Supervisor: Professor Joseph Vybihal.

Lab: McGill University Prometheus Hardware Lab.

Description: Designing and building the basic hardware structure and the control system software for a wheeled autonomous robot.

- Built vehicle on wheels Robot with additional sensors together with a base AI program.
- Robot can explore advanced problems in AI, sensors, robotic group dynamics, and advanced control systems.

Autonomous Agents Research Project   January 2023 – April 2023

Supervisor: Professor Joseph Vybihal.

Lab: McGill University Prometheus Hardware Lab.

Description: Optimizing built hover robot with advanced artificial intelligence algorithms.

- Implementing multi-agent system by controlling boe-bots on MODBUS TCP/IP networks concurrently with hover robot.
- Testing ABM, BDI models, ConGolog Situation Calculus, ROS autonomous agents, and Adaptive Monte Carlo Localization on system.

Kinova Gen 3 Robot Arm Research Project   January 2023 – April 2023

Supervisor: Professor David Meger.

Lab: McGill University Control and Robotics Lab

Description: Use Robotics Operating System to simulate, test, and automate Kinova Gen 3 Robot Arm.

- Researching path and trajectory planning for Kinova Gen 3 Robot Arm using different artificial intelligence and machine learning algorithms.
- Programming Kinova Gen 3 Robot Arm to perform complex tasks using Robotics Operating System, Ubuntu, and Gazebo.

🖥 Teaching Experience

🎓 Computer Science Undergraduate Society Industry Mentorship Program – Mentor

- Lecture 1: Linux Command Line Basics, Git Review, Other important development tools.
- Lecture 2: Introduction to web development.
- Lecture 8: Testing.
- Lecture 9: Security and other advanced topics.
- Lecture 10: Deploying your application.

🎓 Computer Science Undergraduate Society Help Desk – Tutor

- COMP202 Fall 2022 Midterm Review
- COMP202 Fall 2022 Final Review
- COMP206 Fall 2022 Midterm Review

⚙ Technical Skills

Programming Languages: Python, Bash, C, Java, Mips32, Circ (Circuits), Ocaml, JavaScript, Node J.S, HTML, CSS, PHP, SQL, React, Angular, Intel Assembly X86, OpenGL, GLSL, C++, ROS.

Operating Systems: Unix/Linux, Microsoft Windows, Mac OSX, iOS, Android, DOS OS, Raspbian.

Software/Technologies/Tools: Visual Studio, Thonny, CodePost, Command Line, Vim, Visual Studio Code, IntelliJ IDEA, Eclipse, EduFlow, LATEX, Overleaf, XChart, Turbo C, MARS, Logisim Evolution, LearnOcaml, JetUML, UML Diagramming, XAMPP, MEAN, DJANGO, MERN, RESTAPI, Apache, Express, SOCS, Bootstrap, XML, DIV, AJAX, jQuery, DEBUG, IBM PC, Windows Command-Line Assembler, DOSBox, Git, Standard Graphics Cards, Sublime, MASM, TASM, Qt Creator, Putty, FileZilla, Wekzeug, Jinja2, Flask, SQL, MYSQL Workbench, gyroscopes.

Hardware Skills: Arduino, Raspberry Pi, ZS-X11A/B Motor Controllers, MOT-1-BLDC Motor Controllers, Riorand Motor Controllers, IGUS D1 Dryves, PICAN2, CANgine Berry, Soldering, Wiring, Welding, 3D Printers, Hoverboards, Fuses and Fuse holders, gyroscopes, ADIS16448 IMU, ADIS16470 IMU, Digital to Analog Convertors, DFR0552 Module.

Networking: MODBUS TCP/IP, CANBUS, CANOPEN, UART, SPI, I2C.

🖥 Work Experience

🔴 Robotics Software Engineering Intern ● September 2022 → April 2023 ● Robotics Design Inc ● Montreal, Canada

- Advanced the control system software for modified IGUS D1 Dryves by implementing algorithms for limit switch detection and analogue control.
- Added new features to internship project such as tip-teach motor control mode, joystick control and wireless CAN control of motor controllers.
- Implemented advanced protection paradigms for completed flask-based web application and deployed it to Google Compute Engine Cloud.
- Used custom internship project in Host Organization Industry project for well known North American airliner.

Ⓜ Drone Software Engineer ● September 2022 → April 2023 ● McGill Robotics Drone Team ● Montreal, Canada

- Advanced AI-driven planning and mid-course correction programs by refining AI algorithms for autonomous trajectory creation and co-piloting.
- Introduced the use of real-time ROS features such as multi-threading into the drone program in addition to implementing advanced ROS features.
- Implemented robotic features such as motion planning, mapping, manipulators, robot algorithms, deep and machine learning, and computer vision.
- Used different communication protocols such as CAN, I2C, UART, SPI, and others with the 3DR Pixhawk Mini as the autopilot to control drone.

Ⓒ Industry Mentorship Program – Mentor ● September 2022 → April 2023 ● McGill CSUS ● Montreal, Canada

- Gave lectures and conducted the respective post-lecture sessions and helped in slide and study material creation.
- Held weekly office hours to help mentees with issues that they faced regarding the lecture material and the capstone project.
- Attended weekly check-ins with the mentees and other industry mentorship program mentors.
- Fostered an inclusive and equitable learning environment for all mentees of my group.

Ⓒ Help Desk – Tutor ● September 2022 → April 2023 ● McGill CSUS ● Montreal, Canada

- Helped students with quizzes, assignments, projects, and general questions about the Computer Science program course material.
- Attended weekly sessions with other tutors to review tutoring strategies and discuss improvements to the tutoring program suggested by students.
- Arranged weekly study sessions with students facing difficulties in specific areas of a Computer Science or Software Engineering course.
- Coordinated between students unable to benefit fully from the help desk tutoring with Professors and Teaching Assistants of the courses.

🔴 Robotics Software Engineering Intern ● May 2022 → August 2022 ● Robotics Design Inc ● Montreal, Canada

- Built control system software for IGUS D1 dryves using Raspberry pi, Arduino, Intel X86 Assembly, C, C++, Java, CANgineBerry, PiCAN2.
- Designed the graphical user interface to interact with the built IGUS D1 dryves' control system.
- Implemented cross-device testing of solutions to increase user accessibility.
- Used CANOPEN and MODBUS communication protocols to program motor controllers for Stepper, DC, and EC motors with up to 21A and 48V.

🛡 Undergraduate Note-Taker ● January 2021 → Present ● McGill OSD Student Office ● Montreal, Canada

- Provided academic support regarding understanding difficult concepts via email and zoom meetings to students registered with the OSD Office.
- Provided detailed, organized lecture, lab, and tutorial notes to Undergraduate Students.
- Tutored students in various Subjects (Engineering, Computer Science, Physics, Mathematics, Economics).
- Completed over 180 Hours as an Undergraduate Note-taker.

Ⓜ Clerical Assistant – Intern Position ● May 2021 → August 2021 ● Marche Caravan ● Montreal, Canada

- Used graphic design software to edit and design images of the company's website, social media accounts, brochures, presentations, and logos.
- Displayed data in a functional format using word processing software to prepare documents.
- Used graphic design software to design page layouts and format text size, column width, and spacing for the company's promotional materials.
- Researched and entered financial transactions into database management systems.

🏔 Sales Associate - Intern Position ● May 2020 → August 2020 ● Bureau de change Montréal ● Montreal, Canada

- Conducted sales duties involving handling currencies, forms, and general customer service.
- Resolved sales issues, provided assistance to customers, in-person, online and on-phone.