Mohamed Mahmoud

mohamed.mahmoud@mail.mcgill.ca | www.linkedin.com/in/mohamedalkayd | https://MohamedAlKayd.github.io/
Montreal, Canada (Relocate Possible) | https://github.com/MohamedAlKayd | Canadian Citizen (J1/TN Visa Possible)

Education

Bachelor's Degree, Major in Software Engineering • Montreal, Quebec, Canada • April 2023 (Expected)

McGill University

Double Minor: Computer Science & Economics.

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 and designing multi-agent system.

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

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

Supervisor: Professor David Meger.

Lab: McGill University Control and Robotics Lab

Description: Using Robotics Operating System to simulate, test, and automate Kinova Gen 3 Robot Arm with over 2,500 advanced algorithms.

- 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, and drivers.

Teaching Experience

Computer Science Undergraduate Society Industry Mentorship Program – Mentor

Lecture 1	Lecture 2	Lecture 8	Lecture 9	Lecture 10
Linux Command Line Basics, Git Review, Other important development tools.	Introduction to web development: HTML, CSS, JS, MVC, Networks, Communication Protocols.	Testing: Unit Testing, Integration Testing, Network Testing, A/B Testing, Bandit Testing.	Security and other advanced topics including Pegasus, Websockets, Microservices, SSH.	Deploying your application, PaaS, Pages, Gatsby, CI/CD, Feature Flags, VPS, Cloud.

Computer Science Undergraduate Society Help Desk – Tutor

- COMP202: Fall 2022 Midterm Review, Fall 2022 Final Review, Winter 2023 Midterm 2 Review, Winter 2023 Midterm 3 Review.
- COMP206: Fall 2022 Midterm Review, Winter 2023 Midterm 2 Review, Winter 2023 Midterm 3 Review.

COMP206: Introduction to Software Systems – Teaching Assistant (T.A)

- 18 Hours of Discussion board monitoring.
- 12 hours of weekly office hours.
- 50 hours of assignment grading.
- 10 hours of Tests grading and review.

Honours / Awards

Hugh Brock Entrance Scholarship issued by McGill University Scholarships Office: $3,000.00.

Undergraduate Internship Award issued by McGill University Internships Office: $4,000.00.

Tomlinson Engagement Award for Mentoring (TEAM) issued by Tomlinson Project in University-Level Science Education (T-Pulse): $1,200.00

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, scikit-learn, PyTorch, TensorFlow.

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 ● May 2022 → April 2023 ● 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.
- Used CANOPEN and MODBUS communication protocols to program motor controllers for Stepper, DC, and EC motors with up to 21A and 48V.
- Advanced the control system software for IGUS D1 Dryves by implementing 160 algorithms for limit switch detection and analogue control and automation.
- Added 8 new features to previously made internship project such as tip-teach motor control mode, joystick control and wireless CAN control of motor controllers.
- Implemented 14 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.

Note-Taker ● January 2023 → April 2023 ● McGill Student Accessibility & Achievement Office ● Montreal, Canada

- Completed comprehensive notes for 5 classes for the duration of the semester for SSA students and tutored SSA students.

Teaching Assistant ● January 2023 → April 2023 ● McGill University ● Montreal, Canada

- Completed 90 hours as a teaching assistant (T.A) for the COMP206: Introduction to Software Systems undergraduate computer science course at McGill.

Industry Mentorship Program – Mentor ● September 2022 → December 2022 ● McGill CSUS ● Montreal, Canada

- Gave 5 lectures to groups of 45 students and conducted the respective post-lecture sessions and helped in slide and study material creation.
- Attended 13 weekly check-ins with mentors and held 13 weekly office hours to help mentees with issues regarding the lecture material and the capstone project.
- Fostered an inclusive and equitable learning environment for all 4 mentees of my group.

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

- Helped over 100 students with quizzes, assignments, projects, and general questions about the Computer Science program course material.
- Attended 13 weekly sessions with other tutors to review tutoring strategies and discuss improvements to the tutoring program suggested by students.
- Arranged over 20 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.

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 over 800 detailed, organized lecture, lab, and tutorial notes to Undergraduate Students.
- Tutored more than 50 students in various Subjects (Engineering, Computer Science, Physics, Mathematics, Economics).
- Completed over 200 Hours as an Undergraduate Note-taker.

Organizations

CS-CAN: https://cscan-infocan.ca/mohamed-mahmoud/

McGill Robotics: https://www.mcgillrobotics.org/drone

- Drone Software Developer: Refined 6 algorithms for autonomous trajectory creation, implemented 4 different communication protocols for PixHawks.
- Drone Team Sponsorship Representative: Generated $15,000 of sponsorship from Canadian and Foreign companies.

Computer Science Undergraduate Society

- Industry Mentorship Program Mentor: https://mcgill-csus.github.io/industry-mentorship/
- Help Desk Tutor: https://mcgill-csus.ca/helpdesk

Computer Task Force: https://ctf.science.mcgill.ca/