AMRO AL-BAALI

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EDUCATION

M. Eng Mechanical — McGill University
05/2019 - 08/2021

- CGPA: 3.77/4.00.
- Thesis title: *Augmenting Sensor Measurements with INS Estimates in a Graph Based SLAM Problem*.
- Supervisor: Prof. J. R. Forbes.

B. Eng Honours Mechanical, Minor in Computer Science — McGill University
09/2014 - 04/2019

- CGPA: 3.83/4.00. Dean's Honour List 2015, 2018.
- Supervisor: Prof. J. R. Forbes.

EXPERIENCE

Software Developer - Localization and Mapping — Avidbots
09/2021 – 03/2023 Kitchener, Canada

Developed and maintained the calibration, localization, and mapping algorithms for a robot equipped with a 2D LIDAR and a camera such that it is well localized within a pre-defined map. The primary tools used in this job are **ROS**, **C++**, **Python**, **OpenCV**, and nonlinear least squares (mainly using **Ceres**).

Graduate Student - SLAM — DECAR group (McGill University)
05/2019 – 08/2021 Montreal, Canada

Collaborated with Voyis and Sonardyne to develop a SLAM back-end algorithm for an AUV equipped with a third-party INS treated as a black box and the Voyis Insight Pro high-precision laser scanner. The primary tools used in the project are: Lie groups, state estimation, optimization (convex, on-manifold), **MATLAB**, and **C++**.

Mechanical Engineering Intern — MY01
05/2018 – 04/2019 Montreal, Canada

Designed and executed mechanical tests on the MY01 device to pass the medical certification. This included programming the testing platform using **Python**, which involved designing a GUI for the user. Furthermore, I also customized the CAD storage tool Autodesk Vault using **C#** to generate reports in MY01's standards.

Undergraduate Researcher Assistant — DECAR group (McGill University)
09/2017 – 05/2018 Montreal, Canada

Developed a systematic method of controlling a non-minimum phase system with minimal effect on the performance of the system. **MATLAB** was used in this project (control toolbox, LMIs, optimization).

Teaching Assistant — McGill University
09/2017 – 04/2021 Montreal, Canada

- MECH 513 (Control Systems) (Winter 2021)
- MECH 309 (Numerical Methods) (Fall 2019)
- MECH 412 (System Dynamics and Control) (Fall 2017)

AWARDS

- Best Seminar Award 2021
- MEUSMA Award, 2019
- NSERC-USRA Award, 2019
- McGill SURE award, 2017
- Habib Abou-Fayssal Prize, 2018
- Dean's Honour List, 2015, 2018
- Rio Tinto-Evans Exchange Award, 2018

SKILLS

Theory

Linear Algebra	●●●●●
Numerical Optimization	●●●●●
Probability	●●●●○
SLAM	●●●●○
State Estimation	●●●●○
Kalman filtering	●●●●○
Particle filtering	●●●●○
Factor graphs	●●●●○
Computer Vision	●●●●○
Multiview Geometry	●●●●○
Matrix Lie Groups	●●●●○
Control Systems	●●●○○

Programming

C++	●●●●○
Python	●●●●○
Julia	●●●○○
Bash	●●●●○
MATLAB	●●●●●
LaTeX	●●●●●

Software

Linux	●●●●●
Ceres	●●●●○
ROS	●●●●○
ROS 2	●●●○○
GTSAM	●●●○○
OpenCV	●●●○○
Docker	●●●○○

LANGUAGES

English	●●●●●
Arabic	●●●●●