

# MAURICE RAHME

 moribots.github.io

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## PROJECTS

### Quadruped Locomotion from Scratch

**Northwestern University**  Apr 2020 - Jun 2020

- Crafted 12-point Bezier Curve Gait and Leg/Body Inverse Kinematics.
- Simulated and validated in Pybullet with ROS-based joystick interface.
- Deployed ARS Reinforcement Learning for Terrain Adaptation.

### Motion Planning Library in C++ and ROS

**Northwestern University**  Apr 2020 - Jun 2020

- Implemented scalable Probabilistic Roadmap and Grid Map.
- Developed Library containing A\*, Theta\*, D\* Lite, Potential Fields, MPPI.
- Co-created and taught course for 1 credit at Northwestern.

### EKF SLAM on Turtlebot3

**Northwestern University**  Jan 2020 - Mar 2020

- Developed 2D Kinematics library in C++ for Differential Drive robots.
- Wrote feature detection algorithm for LiDAR scanner.
- Performed EKF SLAM with Unknown Data Association.

### Baxter Plays Checkers

**Northwestern University**  Nov 2019 - Dec 2019

- Led 3 teammates to program a Baxter robot to play checkers.
- Utilized ROS, MoveIt, OpenCV, and a custom AI move generator based on the minimax algorithm with alpha-beta pruning.
- Won 1<sup>st</sup> Place out of 6 teams 🏆.

## EXPERIENCE

### Building Automation Intern

**ASEA BROWN BOVERI (ABB)**  Dubai, UAE  May 2018 - Aug 2018

- Co-designed Electrical layout for the Zabeel One project worth \$500,000.
- Composed automation design tool in VBA that saved 5 hours per client order.

### Electrical Engineering Intern - Body Control Module (BCM)

**Jaguar Land Rover**  Gaydon, UK  Jun 2017 - Sep 2017

- Received 'Outstanding' grade on performance review (highest possible).
- Produced BCM code for the 2017 Frankfurt Autoshow in StateFlow.
- Built a line and wall following RC-car module coupled with a digital strain gauge to supplement JLR's "4x4 in Schools" competition.

### Aerodynamics '17 & Suspension '18 Team Manager

**Edinburgh Univ. Formula Student**  Edinburgh, UK  Jul 2016 - Jul 2018

- Designed and manufactured Aerodynamic and Suspension components.
- Managed teams of 8-10 people and led training workshops.
- Taught and mentored team members with CAD in SolidWorks.
- Calculated wheel braking and cornering forces using SIMULINK.
- Built a MATLAB design tool for Parallel/Ackermann steering design.
- Reviewed design reports and raised £9,000 in sponsorship.

## EDUCATION

### Northwestern University

**Master of Science in Robotics**  Aug. 2020

- GPA: 3.92/4.0

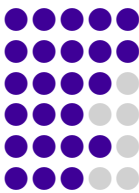
### The University of Edinburgh

**B.Eng (Honors) in Electrical & Mechanical Engineering**  Jun. 2019

- GPA: 4.0/4.0; equivalent of First Class

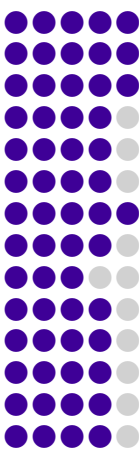
## </> LANGUAGES

C++  
Python  
C  
MATLAB/SimuLink  
LabVIEW  
VBA





## SKILLS


ROS/Gazebo/MoveIt!  
Robot Manipulation  
Motion Planning  
Optimal Control  
SLAM  
Bayesian Filters  
PyBullet  
Machine Learning  
Pytorch  
Linux  
Version Control (Git)  
Unit Testing  
Analogue Electronics  
SolidWORKS



## AWARDS

 **IMechE - Best BEng Project**  
The University of Edinburgh  
The Institution of Mechanical Engineers

 **The Edinburgh Award**  
The University of Edinburgh

 **The Spirit of Formula Student**  
Formula Student UK

## 👤 LANGUAGES

English  
French  
Arabic

