MAURICE RAHME

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PROJECTS

TD3 Reinforcement Learning for Bipedal Robot
Northwestern University Jan 2020 – Mar 2020

- Implemented TD3 algorithm with biologically-inspired reward function.
- Simulated PLEN robot in Gazebo and Pybullet using OpenAI Gym interface.
- Designed manual foot trajectory and deployed to real robot.

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^{st} Place out of 6 teams.

BEng Thesis: PATBLC
The University of Edinburgh Jan 2019 – May 2019

- Developed 2-DOF laser transceivers to command an underwater rover.
- Implemented Kalman Filter and template matching for tracking in LABVIEW.
- Awarded prize: IMechE Best BEng Project for 2019.

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).
- Created task allocation and follow-up system to boost work output, while leading 10-person open issue list meetings.
- 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	●●●●●