MAURICE RAHME

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EXPERIENCE

Staff Robotics Engineer
Boston Dynamics Waltham, MA Jan 2022 – Present

- Developed Task-Space Controller for Stretch Base Driving.
- Performed first-time system-integration of full Stretch Robot.
- Wrote joint-space Hermite Spline trajectory generating behaviour.

Senior Robotics Engineer
Boston Dynamics Waltham, MA Nov 2020 – Jan 2022

- Implemented generic Directed Graph search library.
- Co-authored CAN-interfacing high-rate motor controller code.
- Built bringup software to increase Stretch actuator checkout rate by >12x.
- Created actuator characterisation suite for BLDC motors.

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.
- Calculated wheel braking and cornering forces using SIMULINK.
- Built a MATLAB design tool for Parallel/Ackermann steering design.
- Taught CAD in SolidWorks and raised £9,000 in sponsorship.

PROJECTS

Quadruped Locomotion from Scratch
Northwestern University Apr 2020 - Aug 2020

- Crafted 12-point Bezier Curve Gait and Leg/Body Inverse Kinematics.
- Simulated custom quadruped in Pybullet with sim2real ROS framework.
- Architected novel Rinforcement Learning method for Terrain Adaptation.
- Designed custom quadruped that can be built for under $600.
- Published for IROS 2021.

Motion Planning Library in C++ and ROS
Northwestern University Apr 2020 - Jun 2020

- Implemented scalable Probabilisitc 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 move generator based on the minimax algorithm with alpha-beta pruning.
- Won 1^{st} Place out of 6 teams.

EDUCATION

Northwestern University
Master of Science in Robotics Aug 2020

- GPA: 3.95/4.0

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 ●●●●○
Bash ●●●○○
MATLAB ●●●○○

SKILLS

Robot Dynamics ●●●●●
Robot Manipulation ●●●●●
Motion Planning ●●●●●
Optimal Control ●●●●○
Bayesian Filters ●●●●○
ROS ●●●●○
Gazebo, Pybullet ●●●●○
URDF/Xacro ●●●●●
Linux (Ubuntu) ●●●●○
Git ●●●●○
Unit Testing ●●●●○
Altium ●●●●○
Analogue Electronics ●●●●○
3D Printing ●●●●○
SolidWORKS/OnShape ●●●○○

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 ●●●●●