Maurice Rahme

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Summary

➢ Roboticist at Boston Dynamics experienced in Motion Planning techniques.

➢ Helped take Stretch from a prototype to a real product with >6 million customer boxes moved to date.

➢ Expanding into Mechanistic Interpretability to improve the control-ability and performance of applied ML.

Education

Northwestern University,	MS in Robotics - GPA: 3.95/4.0	Sep 2020
The University of Edinburgh,	B.Eng Mechatronics - First Class, GPA: 4.0/4.0	Jun 2019

Experience

Staff Robotics Engineer, Boston Dynamics – Detroit, MI (Remote)   Jan 2022 - Present
- Tech Lead for Stretch Motion Planning and technical mentor to 5 colleagues.
- Currently implementing Hybrid ML/Optimal Control scheme to upgrade performance.
- Enabled highly dextrous motion generation as seen at MODEX.
- Created novel methods for extracting trapped payloads in complex environments.
- Increased Stretch's payload capacity from 15kg to 23kg using Wrench Minimization.
- Enhanced handling of poorly supported cargo through sag-predictive collision avoidance.
- Boosted Stretch trajectory speed by >2x.

Senior Robotics Engineer, Boston Dynamics – Waltham, MA   Nov 2020 - Jan 2022
- Implemented Directed Graph search library (A*, D*Lite).
- Wrote Task-Space Controller for Stretch Base Driving.
- Designed robot manufacturing SW, enabling the production of >100 Stretch robots in 3 years.

Publications

Linear Policies are Sufficient to Enable Low-Cost Quadrupedal Robots to Traverse Rough Terrain - 10.1109/IROS51168.2021.9636011	Sep 2021

Projects

Learning Quadruped Locomotion from Scratch
- Architected novel Reinforcement Learning method for Terrain Adaptation.
- Designed and open-sourced quadruped that can be built for under $600.

Motion Planning in C++
- Implemented scalable Probabilisitc Roadmap and Grid Map.
- Developed Library containing A*, Theta*, D*Lite, Potential Fields, MPPI.

EKF-SLAM on Tutlebot3
- Developed 2D Kinematics library in C++ for Differential Drive robots.
- Performed EKF SLAM with Unknown Data Association.

Technologies

Languages/Libraries: C++, Python, Eigen, Pytorch, Pandas, ROS, Gazebo, Mujoco, Pybullet, URDF/XACRO, Git

Technical: Manipulation, Optimal Control, State Estimation, Machine Learning