Thomas Huckell

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Objective

Robotics Hardware Developer with a strong foundation in mechanical design and a research background in biomechanics, modeling and control of legged robots. Eager to leverage my expertise in advanced engineering, product development and R&D to drive innovation.

Experience

A&K Robotics March 2023 - Present
Robotics Hardware Developer *Vancouver, BC*

- Led Hardware R&D team to build and deliver an autonomous mobile robot for passenger transport within airport terminals, currently under trial at YVR.
- Designed and integrated electrical/mechanical systems with sensors, power, communication and drive systems, ensuring safety and performance.
- Utilized CAD and FEA simulations to test, validate, and refine designs, ensuring optimal performance and safety under anticipated loading conditions.
- Leveraged rapid prototyping and in-house manufacturing, while collaborating with external manufacturing partners to outsource fabrication to meet budget and timeline constraints.

Queen's Mostly Autonomous Sailboat Team April 2017 - May 2019
Mechanical Engineering Manager *Kingston, Ontario*

- Led a mechanical design team of 10+ undergraduate students with the development of a sailboat to compete in the International Robotic Sailing Regatta
- Designed and constructed molds from CAD parts to fabricate sailboat's hull, keel and rudder from composite materials

Education

Queen's University Sept 2019 - May 2022
MASc in Mechanical and Materials Engineering (GPA: 4.19 / 4.30) *Kingston, Ontario*
Thesis: *"Standing Balance of Legged Robots: Leveraging Reduced Order Models to Improve Balancing Performance"*

- Proposed balancing model for legged robots that extends existing models to include additional balancing strategies
- Utilized model predictive control (MPC) and trajectory optimization to compare push recovery performance of the proposed balancing model against existing models
- Validated implementation of the MPC on a one-legged robot in a push recovery simulation in Simulink Simscape Multibody

Queen's University Sept 2015 - May 2019
BASc in Mathematics and Engineering (GPA: 3.80 / 4.30) *Kingston, Ontario*

- Dean's Scholar with First Class Honours
- Recipient of the R.H. Clark Applied Science Centennial Scholarship

Publications/Awards

IROS 2022 Oct 2022
Improved Zero Step Push Recovery with a Unified Reduced Order Model of Standing Balance *Kyoto, Japan*
RAIS 2021 Oct 2021
Winner of Poster Competition in the Robotics category *Kingston, Ontario*

Skills

Languages: C++, Python, MATLAB, Latex
Software Tools: Fusion360, Solidworks, Simulink, ROS, OpenCV, MS Office Suite, KiCad
Technical: Optimal Control, Linear Control, Dynamic Modeling, Simulation, Embedded Systems, CAD, FEA analysis, GD&T
Rapid Prototyping: 3D printing, Laser/waterjet Cutting, Soldering, cable fabrication, CNC Machining, Welding

Interests

Kayak Guide and Instructor (Paddle Canada Certified) — SUP — Woodworking — Skiing — Biking — Golfing