Roy Xing
Roboticist

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SKILLS

Programming	C++, C, Python, MATLAB, valgrind, gdb, emacs, Linux, git
Electronics | CAD	Micro Controllers, EagleCAD, SolidWorks, OnShape, Soldering
Robotics	ROS, OpenCV, Control Theory [MPC LQR PID], SLAM, Inverse Kinematics, LiDAR, Drake Physics Simulator, Reduced Order Models [SLIP, ASLIP, etc.]

EXPERIENCE

Present – Oct 2019 | **MassRobotics | Robotics Assistant Lab Manager and Robotics Technician**
- Programmed AMRs for live demos and simulations.
- Setup, programmed, and maintained various robot arms.
- Managed, built, and designed 3D printers, and robot grippers.
- Wrote libraries for actuators, end-effectors, and sensors for low level processes and ROS compatibility.

Toyota HSR | UR Arms | ROS | grippers | LiDAR | 3D Printers | IR cameras | SLAM | Embedded Systems

Present – Sept 2021 | **BU Robotics Lab (Dr. John Baillieul) | Research Assistant**
- Programmed and maintain Jackal UGV Robot from Clearpath robotics for experiments.
- Consult and plan out current ONR research.
- Aided in experiments with the Jackal UGV with various SLAM algorithms, utilizing the ZED 2 depth camera.

ROS | AMRs | UGVs | SLAM | C++ | Python | Depth Sensing

Aug 2021 – Jan 2021 | **Thinking Robots | Robotics Intern**
- Worked on manufacturing and developing novel open source tethered mobile robotics base for UV solutions during the COVID-19 pandemic.
- Created extension for social robotics' chassis, enabling future add-ons and support modules.

OnShape | AMR's | C++ | OnShape CAD | 3D printing | Robot Assembly

Sept 2018 – Aug 2019 | **Dynamic Robotics Laboratory (PI : Dr. Jonathan W. Hurst) | Research Assistant**
- Conducted research on the physical principles of legged locomotion through dynamic analysis and biomechanics research. Worked with and aided in maintaining a CassieV2 from Agility Robotics (lab spin-off).
- Implemented MPC (Model Predictive Control) in MATLAB and Python meant for walking LIP (linear inverted pendulum) as seen in the MIT Cheetah 2 for autonomous mobility.
- Aided in outdoor experiments of the Cassie robot's reinforcement learning walking controllers.

Cassie Robot | Control Theory | MPC | EGB | Bipedal Reduced Order Models | SLIP | LIP | MATLAB | Python

Sept 2018 – June 2018 | **Booz Allen Hamilton (Defense Consulting Firm) | Air Force Division Systems Operations Intern**
- Wrote code on projects such as organizational operation programs and performed code reviews of various languages (Python, C++, C, VBA) for a broad range of contracts and subsystems.

Python | C++ | C | VBA

Sept 2016 – June 2016 | **Aptima (Military Defense Contractor) | Computer Vision and Robotics Intern**
- Wrote programs for solving advanced computer vision problems based on aerial drone video datasets with OpenCV in C++.
- Created ROS (Robot Operating System) projects for brain controlled robotics in Python.

C++ | OpenCV | ROS | Python | drones | Kinova Arm

EDUCATION

2018 Oregon State University [Honors College] [GPA : 3.97/4.00] [BS : Electrical and Computer Engineering with a focus in Robotics (Minor in CS and Maths)]

2021 Boston University [GPA : 4.00/4.00] [BS : Electrical Engineering]

HONORS AWARDS PUBLICATIONS

>Paper acknowledgements, "Visual Navigation Using Sparse Optical Flow and Time-to-Transit"
>Paper acknowledgements, "Eliminating Peak Impact Forces by Customizing the Passive Foot Dynamics of Legged Robots"
>Journal acknowledgements, "Mitigating Peak Impact Forces by Customizing the Passive Foot Dynamics of Legged Robots"
>AFCEA (Armed Forces Communications and Electronics Association) Fellowship Award 2018
>Letter of Commendation by Commonwealth of MA Speaker of the House for Achievement in STEM
>Official Citation by MA State Senate for STEM excellence for winning the RWDC State Championship and National Challenge Merit Award

Projects

Wheeled Biped : Biped robot on wheels like Boston Dynamics' Handle C++ C Python Control Theory LQR Cascaded PID IK

Mini Quadruped : Created and programmed a mini dynamic quadruped C++ Python Control Theory MATLAB 3D printing

Furuta Pendulum : Furuta Pendulum w/ Moteus Controller, simulated and controlled with Drake C++ Python Control Theory OnShape Drake BLDC

6 DOF Robot Arm : Robot Arm w/ force sensing, current control, etc. Python IK CAD 3D printing Dynamixel Servos

Fetch | Turtlebot3 : AMRs I made to navigate and fetch user designated objects Turtlebot3 CAD OpenCV ROS SLAM

References are available upon request from the following :

- Joyce Sidopoulos (Vice President, Programs Community) | MassRobotics
- Tom Ryden (Executive Director) | MassRobotics
- Dr. Jonathan Hurst (CTO Professor) | Agility Robotics & OSU
- Dr. Matthias Scheutz (CEO Professor) | Thinking Robots & Tufts University
- Dr. John Baillieul (Distinguished Professor) | Boston University