RYAN KING-SHEPARD

ryankshub.github.io ⋄ ryanking-shepard2022@u.northwestern.edu

314-225-4470 ⋄ Chicago, IL 60626

EDUCATION

Northwestern University — Evanston, IL
M.S. in Robotics — *Sept 2021 - Current*

Massachusetts Institute of Technology — Cambridge, MA
B.S. in Electrical Engineering & Computer Science — *June 2016*

WORK EXPERIENCE

Aurora Flight Sciences, a Boeing Company — Cambridge, MA
Software Robotic Engineer — *July 2016 - July 2021*

· Created critical mission management software for autonomous flights with Simulink and C++ to produce flight behaviors in accordance with the FAA.
· Developed sensor fusion with GPS, IMU, ADS-B, cameras, radar and more, to present accurate aircraft state.
· Served as an integration master that ensured software test were consistent with flight test cards and autonomy modules were robust in uncertain environments.
· Produced a Java GUI tool to codify pilot operation manuals and transferred them into data structures that offered more flexibility for human-robot cooperative flights.

PROJECTS

Remote Control Omni-directional Robot CyTri — Evanston, IL
Embedded Engineer, Python Developer, ROS Developer — *Feb 2021 - Current*

· Laser-cut and 3D-printed robotic platform and motor homes designed in OnShape
· Implemented ROS python Feedforward + P controller on Google Coral to apply commands over wireless network
· Designed circuit and established serial connections for reading encoders and publishing PWM signals

Simulated SLAM with Extended Kalman Filter — Evanston, IL
C++ Developer, ROS Developer — *Jan 2021 - March 2021*

· Developed ROS C++ packages to perform SLAM with the Extended Kalman Filter.
· Implemented helper utilities to compute rigid 2D motion, diff drive kinematics, and sensor interfacing.
· Simulated results in custom rviz model where robot navigated around obstacles and localized position.

Dynamic Bartending with a 7-DOF Robot Arm — Evanston, IL
Software Engineer, System Integrator — *Sep 2021 - Dec 2021*

· Implemented python ROS node to take client's orders and provided an efficent action list to create drinks.
· Crafted python package and xml configuration to codify and parse drink recipes.
· Responsible for enforcing git workflow and resolving merge conflicts during integration.
· Demonstrated robot's ability to grab ingredients from staging area to mix them in deliver zone.

Mobile Manipulator Robot Simulation with youBot — Evanston, IL
Python Developer inferfacing with CoppeliaSim — *Sep 2021 - Dec 2021*

· Simulated mecanum-wheeled robot motion with five DOF arm to manipulate virtual block's position in CoppeliaSim
· Implemented trajectory generator to craft end-effector path as a series of body velocity commands
· Optimized feed-forward + P.I. controller to improve performance following trajectories with disturbance handling.

SKILLS

Programming Languages	Python, C++, C, Arudino, Matlab, and Java,
Software Tools	ROS (Robot Opertating System), CMake, Simulink,
	Connext Data Distribution Service(DDS) and ZeroMQ
Robotics Experence	Controls, Machine Learning, Artificial Intelligence, OpenCV, Gazebo, Coppelia Sim, Move It
Version Control	Git, Gitlab, Svn
Hardware Experience	Soldering, Laser-cutting, 3D Printing, Onshape(CAD),
	Microcontrollers, I2C, SPI, LIDAR, IMUs and motor drivers
Operating Systems	Linux(Ubuntu, CentOS), Windows