RUIBO YAN

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EDUCATION

Worcester Polytechnic Institute *Aug. 2016 - Dec. 2018*
Master of Science, Robotics Engineering GPA: 3.80/4.00

North China Electric Power University *Sept. 2011 - July 2015*
Bachelor of Science, Automation Engineering GPA: 88.3/100

RESEARCH EXPERIENCE

Fabrication and Control of a 3-D Origami Snake Robot Worcester, MA
Soft Robot Lab, WPI *Feb. 2017 - Dec. 2018*

- Created a Origami Snake robot that is capable of both lateral undulation and side-winding
- Analyzing the behavior of the OriSnake under different locomotion parameters and
- Searched for an optimal set of parameters for maximum linear speed for both locomotion gaits.

Design and control of Origami Continuum Manipulator Worcester, MA
Soft Robot Lab, WPI *Sept. 2016 - Feb. 2017*

- Fabricated 3-DOF novel designed origami continuum manipulation modules
- Analyzed stiffness (torsional, axial, bending) of origami actuators via motion capture system

PUBLICATIONS

- Ming Luo, **Ruibo Yan**, Zhenyu Wan, Yun Qin, Junius Santoso, Erik H. Skorina, and Cagdas D. Onal. Orisnake: Design, fabrication, and experimental analysis of a 3-d origami snake robot. *IEEE Robotics and Automation Letters,* 3(3):1993–1999, 2018
- Junius Santoso, Erik H. Skorina, Ming Luo, **Ruibo Yan**, and Cagdas D. Onal. Design and analysis of an origami continuum manipulation module with torsional strength. In *2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 2098–2104, 2017

WORK EXPERIENCE

Robotics Engineer, Staples Inc. (Framingham, MA) *Feb 2019 - Mar. 2020*

Robotics Project 1**:** Warehouse Robot Prototype

- Designed hardware and electric systems of a warehouse mobile robot that carries storage unit
- Developed an control system that generates paths and drives the robot stably with 500lbs loads in ROS

Robotics Project 2: Retail Store Person-follow-cart Smart Cart Prototype

- Managed a team of 4 interns to conduct development in hardware, perception, and control for Smart Cart
- Led design and build of a self-navigation test platform and developed localization and self-navigation pipeline

Advanced Robotics R&D Co-op, Amazon Robotics (North Reading, MA) *Jan. 2018 - July 2018*

- Developed a ROS (Python) package to control new-designed effectors via joystick
- Setup a dual-manipulator workstation and created a complete set of URDFs to display the entire station in RViz
- Extended internal ROS stack to enable people to select pick point with an interactive marker from People

Software Engineer III, Staples Inc. (Framingham, MA) *Mar. 2020 - present*

Big Data Project: Staples Promotion Analysis

- Maintained high availability of promotion analytics API and validated weekly data engineering and analysis result
- Led the cloud architecture design and the development of the cloud version of the entire product on Azure

INDEPENDENT PROJECTS

C++ NanoDegree, Udacity *Jan. 2020 - May 2020*

- Implemented A* algorithm that generates path between two points in an OpenStreetMap map
- Designed a htop-like system monitor that can display system and process information in Linux environment
- Improved the performance of a ChatBot application with move semantics and smart pointers to achieve clear object ownership and better resource usage
- Developed a concurrent system that enables cars to run according to multiple traffic lights with mutex, lock guard

Self-Driving Car Nanodegree, Udacity *May 2017 – May 2018*

- Developed a PID controller and a MPC controller to drive a vehicle in a simulator track (**Control**)
- Programmed a particle filter to localize a vehicle with sensor information with RSME less than 0.4 (**Localization**)
- Created an Extended Kalman Filter fusing Radar and Lidar data to estimate pedestrian's position with RSME less than 0.1 (**Sensor Fusion**)
- Generated a dataset of vehicles (featuring by spatial binning color, color histogram, and histogram of gradient (HOG)) and used LinearSVC to train a car classifier acquired 98.3% accuracy (**Machine Learning**)
- Detected lane lines and marked driving area with polynomial-fit boundary in video with sobel threshold and color threshold binary images from each frame (**Computer Vision**)
- Trained a traffic sign classifier (LeNet) with preprocessed 43-class (50,000+ images) on AWS with validation accuracy with 94.3% and test accuracy 94% (**Deep Learning**)
- Controlled a vehicle to drive with a model (LeNet) trained with data collected from human (**Deep Learning**)

PROFESSIONAL SERVICE

- Reviewer : IEEE International Conference on Robotics and Automation (ICRA)

SKILLS

- **Programming Languages:** C++, Python, Java, C, Scala
- **Software:** ROS, Gazebo, MATLAB, Arduino IDE, AWS, Hadoop, Hive, Git, latex
- **Hardware:** Arduino, Nvidia TX2, UR10 Robot, Jaco Robot Arm