Erica Tevere

etevere@umich.edu • (908) 328-7517 • etevere11.github.io

EDUCATION

Johns Hopkins University | MS in Robotics – Faculty Scholarship Recipient (GPA: 3.6/4.0)   May 2021

University of Michigan – Ann Arbor | BS in Mechanical Engineering (GPA: 3.6/4.0)   May 2019

WORK EXPERIENCE

National Institute of Standards and Technology | Gaithersburg, MD   August 2020 - Present
Robotics Software Intern – Grasping, Manipulation, and Safety of Robotic Systems Group

- Integrating perception hardware onto a robotic arm and implementing algorithm to localize a given task board in robot workspace
- Interfacing 3+ robotic arms and manipulators with ROS and creating simulation environments in Gazebo for testing
- Developing a deep learning pipeline to recognize manufacturing parts and plan robot motion for assembly of a task board
- Researching and developing standard for grasp efficiency and test methods to detect object slip during manipulation tasks

Autonomous Systems Control and Optimization Lab | Baltimore, MD   March 2020 - Present
Graduate Research Assistant

- Integrating depth sensing onto a mobile robot to detect and track static and dynamic obstacles in unpredictable environments
- Determining accurate position and orientation of obstacles relative to vehicle using deep learning and computer vision techniques
- Investigating deep learning methods to perform semantic scene understanding of drivable surfaces for changing environments
- Creating pipeline to use vehicle odometry and RGBD camera data to recognize and interpret a scene and plan vehicle trajectories

FANUC America Corporation | Rochester Hills, MI   May 2019 - August 2019
Robotics Software Intern – Motion Planning Group

- Developed and implemented prototype system to perform dynamic path planning using Intel RealSense D435 RGBD camera
- Performed testing for 8 motion options on upcoming software release, determined root cause issues, and coordinated bug fixes

Autonomous Robotic Manipulation Lab | Ann Arbor, MI   May 2018 – Dec. 2018
Undergraduate Research Assistant

- Evaluated limitations of Robotiq 3-finger gripper during grasping to produce functional requirements of replacement gripper
- Designed a parallel gripper with 7 inches less of obstacle interference and 1 inch more of travel in grasping direction
- Incorporated force sensing into gripper fingertips to improve motor control when grasping deformable objects in testing

NASA Jet Propulsion Laboratory | Pasadena, CA   May 2017 – Dec. 2017
Mechanical Engineering Intern – Planetary Sample and Acquisition Handling Group

- Produced early-stage prototype of excavation devices in 2 week cycle turnarounds and tested on unpredictable surface conditions
- Created Python tool to automatically generate movement sequences for testbed robotic arm resulting in decrease in individual test duration by 20%, a reduced required training level of operators, and lower frequency of human error faults during testing
- Determined root cause issue preventing ball locking mechanism from actuating and altered machining tolerances for testing

PROJECT EXPERIENCE

Early Fall Detection From Video Using 3D-CNNs – Winner of Intuitive Surgical Best Project Award   Nov. 2020 – Jan. 2021
- Adapted 3D-ResNet architecture to perform frame wise classification of falls using temporal information from video feed
- Implemented transfer learning approach using model pre-trained on Kinetics-700 action recognition dataset and performed supervised fine-tuning on fall datasets

Autonomous Ride Sharing Vehicle Optimal Planner and Trajectory Tracking Control   March 2020 – May 2020
- Computed optimal route using Dijkstra's algorithm and dynamic programming given known environmental constraints
- Solved for the optimal trajectory of the route using simple car dynamics model and multiple shooting with the ACADO toolkit
- Designed a non-linear trajectory tracking controller using feedback linearization

SAE Michigan Baja Racing – Project Lead ('18-'19), Testing Colead ('17-'18), Composites Lead ('16-'17)   Sept. 2015 – August 2019
- Iterated through early-stage design concepts in 2-month period to determine impact on vehicle performance and set project goals
- Managed final design decisions, system integration, and vehicle timeline resulting in record breaking 1st place season finish
- Interfaced with contract manufactures, acquired materials and tooling, and managed and contributed to in-house manufacturing
- Oversaw $100,00 budget, sponsor relations, recruitment, and community outreach of 30+ person team
- Orchestrated 6-week on-car testing period to quantify performance of vehicle and tune critical subsystems

PUBLICATIONS

Yahnker, C., Shiraishi, L.R., … Tevere, E.L. "Introduction to Tools and Techniques for Surface Sampling on Europa." *16th Biennial ASCE Aerospace Division International Conference on Engineering, Science, Construction, and Operations in Challenging Environments*, Cleveland, Ohio, April 9-12, 2018.

SKILLS

Programming: Python, C++, MATLAB/Simulink, ROS (MoveIt, Navigation Stack), Gazebo, PyTorch, TensorFlow, OpenCV
Embedded Systems/Sensors: Arduino, Raspberry Pi, depth cameras, IMU, strain gages, infrared sensors, Hall effect sensors
Software: CAD (NX, CATIA, SolidWorks), Siemens Teamcenter, FEA/Optimization (Altair HyperWorks)
Manufacturing: manual and CNC mill and lathe, 3D printing, carbon fiber layups, familiar with GD&T, familiar with welding