DEVESH DATWANI

GRADUATE STUDENT, ROBOTICS ENGINEERING
WORCESTER POLYTECHNIC INSTITUTE, WORCESTER, MA

LINKS
[GITHUB] [LINKEDIN] [PERSONAL WEBSITE]
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PROGRAMMING LANGUAGES

- Python 3+
- C++ / C
- MATLAB

SOFTWARE STACK

- ROS 1 & 2
- TensorFlow & PyTorch
- OpenCV
- Git
- Django, Flask & AWS
- Numpy, Pandas & Scikit Learn
- SolidWorks, AutoCad
- Linux

INTERESTS / EXPERTISE

- Deep Learning
- Computer Vision
- SLAM

EDUCATION

MS IN ROBOTICS ENGINEERING
WORCESTER POLYTECHNIC INSTITUTE
WORCESTER, MA | AUG 2021 - MAY 2023

BE IN MECHANICAL ENGINEERING
APSIT MUMBAI UNIVERSITY
MUMBAI, INDIA | AUG 2014 - MAY 2018

Notable Achievement: Received the "Young Innovator" award for research on Plasma Actuators at the ICASTe conference, India

ENGINEERING PROJECT

AERIAL VEHICLE AUTONOMY [DOC]

2011 - 2019 | MUMBAI, INDIA

- Designed, fabricated and flight tested semi autonomous aerial vehicles
- Designed fixed wing aircraft powered by internal combustion engines
- Implemented PD controllers in C++ & Arduino for cruise control autonomy
- Gained hands-on experience after testing 10+ aerial vehicle designs

WORK EXPERIENCE

ADMATAZZ | DATA ENGINEER

DEC 2019 - DEC 2020 | MUMBAI

- Worked in the data analysis team to improve marketing strategies through data acquisition & interpretation
- Built web applications for market analysis with Django, Python & AWS
- Integrated clustering algorithms with web applications for semantic analysis
- Built web crawling tools for real time data acquisition from social media platforms like Twitter, Reddit & Google
- Helped organize marketing strategies

CAPSTONE PROJECT

FIRE FIGHTING ASSISTIVE RESPONSE ROBOT [GITHUB]

AUG 2022 - DEC 2022 | WPI & WORCESTER

- Engaged with stakeholders for problem statement identification & explored solutions in robotics domain tailored for the end user
- Discussed a multitude of challenges in fire fighting scenarios with the Chief & Deputy Chief of the Worcester Fire Department
- Developed a mobile robot solution for fire-exit safety evaluation
- Integrated a navigation stack for autonomous path planning & validated accurate robot localization through particle filtering
- Implemented floor map change detection with PCA & K-means
- Constructed a novel approach for evaluating real-time fire safety status of buildings by mapping and analyzing 2D LiDAR data

ACADEMIC PROJECTS

VISION BASED ROBOT OPERATION [GITHUB]

SEP 2022 - NOV 2022 | WPI

- Conducted user studies to compare & analyze hand gesture & joystick based controlling techniques in ROS 1 & Gazebo world
- Implemented an estimation graph pipeline for real-time hand pose estimation based on single shot detectors with MediaPipe
- Optimized keyframe detection for low latency-smooth operation of the estimator for teleoperation / manipulation tasks in Gazebo
- Recorded time performance and Likert questionnaire from users

TRAFFIC SIGN DETECTION WITH MASK R-CNN [GITHUB]

SEP 2021 - DEC 2021 | WPI

- Built a training pipeline for fine tuning the Mask R-CNN model on a non-English traffic sign dataset with Tensorflow & Python
- Implemented adaptations to the Mask R-CNN model to enhance performance metrics on traffic sign detection tasks
- Improved mean average precision values by ~50% by training the model on augmented dataset & troubleshooting labeling errors

URBAN STREET SEMANTICS WITH UNET [GITHUB]

MAR 2022 - MAY 2022 | WPI

- Built & trained a U-Net model in PyTorch for multi-class image segmentation in urban scene for autonomous vehicle perception
- Implemented Resnet blocks on the postulated network architecture to improve accuracy on the CityScape dataset
- Studied pruning methods for real time frame rate optimization

LAB EXPERIENCE

SPACE GOAT

SEP 2021 - JAN 2022 | WPI

- Represented WPI in a team of 15 at NASA Big Idea Challenge
- Partook in design and construction of a robot tailored for Mars
- Constructed an OTM power distribution mechanism for the rover
- Integrated an imu & ultrasonic sensor with the robot & wrote a complementary filter in C++ for accurate attitude estimation

PLASMA ACTUATORS [DOC]

2017 - 2018 | MUMBAI UNIVERSITY, INDIAN INSTITUTE OF TECHNOLOGY
PATENT APP NO. 201921038313

- Spearheaded a team of 3 students to design a research project on airflow induction & actuation through a plasma actuator
- Developed a novel plasma actuator design for airflow induction inside hollow pipes basing pipe material as dielectric medium
- Conducted experiments at the Aerospace Department of Indian Institute of Technology & recorded air flow of ~ 9000 liters / hour