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
- Robotic Perception

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

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

ENGINEERING PROJECT

AERIAL VEHICLE AUTONOMY [DOC]
2011 - 2019 | MUMBAI, INDIA

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

CAPSTONE PROJECT

FIRE FIGHTING ASSISTIVE RESPONSE ROBOT [GITHUB]
AUG 2022 - DEC 2022 | WPI & WORCESTER - Capstone Project

- 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 scalable mobile robot solution & constructed a novel approach to evaluate real-time fire safety with SLAM & RRT
- Built a finite state machine for autonomizing robot task cycles
- Integrated a navigation stack for autonomous motion planning & validated accurate robot localization through particle filtering
- Implemented an obstacle recognition algorithm on cloud point data with PCA & KMeans generally intended for remote sensing

ACADEMIC PROJECTS

VISION BASED ROBOT TELEOPERATION [GITHUB]
SEP 2022 - NOV 2022 | WPI - Human Robot Interaction

- Conducted user studies & analyzed quantitative & qualitative data on hand gesture & joystick based teleops in Gazebo & ROS 1
- Implemented an ML pipeline for real time hand pose estimation on CPU using multi view bootstrapping technique by MediaPipe
- Integrated the ML pipeline with ROS 1 interface for mapping keypoint estimates with mobile robot teleoperation commands
- Built an intuitive human robot interface for high-latency teleops

TRAFFIC SIGN DETECTION WITH MASK R-CNN [GITHUB]
SEP 2021 - DEC 2021 | WPI - Machine Learning

- Built a training pipeline for fine tuning the Mask R-CNN model on a non-English traffic sign dataset with Tensorflow & Python
- Implemented sample re-distribution, sample weighting & region pass through adjustment adaptations on to the model
- Observed an increase in mAP scores by ~50% after training the adapted model on harsh-weather-condition synthetic dataset

URBAN STREET SEMANTICS WITH UNET [GITHUB]
MAR 2022 - MAY 2022 | WPI - AI for Autonomous Vehicles

- 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

LAB EXPERIENCE

SPACE GOAT
SEP 2021 - JAN 2022 | WPI - Team Member (Design & Perception)

- Represented WPI in a team of 15 at the NASA Big Idea Challenge
- Designed & constructed a robot intended for operation on Mars powered by clutch-controlled OTM power distribution technique
- 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 to design a research project on plasma actuators for airflow induction without conventional devices
- Constructed a novel actuator design for airflow induction inside hollow pipes basing the pipe material as the dielectric medium
- Conducted experiments at the Aerospace Department of Indian Institute of Technology & recorded air flow of ~ 9000 liters / hour