Pranay Mathur

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WORK EXPERIENCE

July 2020 - Present

Undergraduate Researcher, University of Nevada, Reno, USA

Project Title: Computationally Constrained Visual Inertial Odometry

- Worked on **Visual Inertial Odometry** solutions for Micro aerial vehicles with **computationally constrained environments**
- Contributed to the **Intel ISL Open3D project** and released two-open source ROS packages that were made a part of ROS-perception(LINK)
- **Worked under the guidance of Prof.Kostas Alexis**

June 2020 - July 2020

Technical Intern, KPIT Technologies, Pune

Project Title: Object Detection through Multimodal-Sensor Fusion of LiDAR, RADAR and monocular camera using Deep Learning

Worked on Object Detection using Multimodal Sensor Fusion of LiDAR and monocular camera based on **Deep Learning and developed a novel algorithm from scratch for detection of vehicles and pedestrians** implemented using tensorflow and ROS (LINK)

May 2019 - July 2019

Research Intern, Council of Scientific & Industrial Research (CSIR) Central Electronics Engineering Research Institute, Pilani, India

Project Title:Autonomous Navigation of Drones using SLAM and Object Avoidance using a Depth Camera

- Worked on embedded systems, Pixhawk and Arducopter flight controller,(Robot Operating System)ROS, Python,Intel Realsense D435i Depth Camera and algorithms for autonomous traversal and Simultaneous Localisation and Mapping in GPS denied environments
- **Worked under the guidance of Dr.S.A Akbar,Chief Scientist CEERI Pilani, India**

EDUCATION

B.E(Hons.) Electronics and Instrumentation	BITS Pilani, K.K Birla Goa Campus	**CGPA 8.6**	2017-Present
Class 12	Army Public School, New Delhi	**94.8%**	2016-2017
Class 10	Army Public School, New Delhi	**CGPA 10**	2014-2015

ADDITIONAL SKILLS

Computer Vision, Digital Image Processing, Microelectronic Circuits, Control Systems, Digital Design, Electronic Devices, Microprocessors and Interfacing, Digital Electronics, Automation, Embedded Systems, ROS(Robot Operating System), Verilog, Linux, Cadence Virtuoso, Proteus, Arduino, C, C++, Python

PROJECTS

Drone Delivery Using SLAM and Object Avoidance **May 2019- Present**

Emedded Systems,Software Development,Aerial robotics, LINK

- Project **selected for funding** by Electrical and Electronics Department, BITS Goa
- Selected for **funding by Sandbox Fabrication Laboratory**, BITS Goa
- Developing an algorithm for autonomous navigation of drones in GPS denied environments using Simultaneous Localization and Mapping and a depth sensing camera for object avoidance.
- Development of custom computer vision algorithms for obstacle avoidance and recognition using Canny edge detection, and binarizing images.

Faculty Coordinator: Dr. Sarang C. Dhongdi, Assistant Professor, Dept. of EEE

Drone Control using Brain Wave Mapping **Dec 2018 - Present**

Cognition,Aerial Robotics,Electronics, LINK

- The project was the **recipient of the prestigious Prof. Suresh Ramaswamy Memorial Award**
- Project was selected for funding by Electrical and Electronics Department, BITS Goa
- The project used brain wave mapping to ensure that the user could control a drone using just his thoughts.SVM was used for classification and recursive least square estimation was used to increase robustness of the prediction.
- Worked with Processing3, Python, Emotiv, ROS, mavros and Dronekit

Faculty Coordinator: Dr Veeky Baths

Human Machine Teaming **Jun 2018 - Apr 2019**

- Electronics,Aerial Robotics,Brain Computer Interface
- Successfully contributed to a completed project allotted by Defence Research and Development Organization, (**DRDO**) India based on human machine teaming and swarm robotics.
- Worked on ROS (Robot Operating System), Python, RotorS and Gazebo

Faculty Coordinator : Prof. Neena Goveas

Project Kratos – Mars Rover **Dec 2017-Present**

- Development of a mars rover as part of the University Rover Challenge (URC) LINK
- Project selected for funding by the Sandbox Fabrication Laboratory, BITS Goa
- Worked with the Communication team in using ROS for communicating data wirelessly
- Worked on setting up Communication Networks using the Ubiquiti Networks Platform. Also worked on automation of processes using ROS and bash scripting in LINUX

IC Tester - Microprocessors and Interfacing **Jan 2019 - May 2019**

Project completed successfully as part of Microprocessors and Interfacing course (LINK)

Used 8086 microprocessor to design an IC tester circuit that included simulation in proteus .

Faculty Coordinator : Dr.Anupama

Stabilisation of UAVs using Gyroscope and Accelerometer **Dec 2017-Jun 2018**

Project completed as part of the Aerodynamics Club, BITS Goa (LINK)

Worked on Arduino Mega 2560 and MPU 6050 gyroscope and accelerometer. Used PID controller implementation to obtain optimized results for stabilization of aircraft in adverse operating conditions

POSITION OF RESPONSIBILTY

Teaching Assistantship-Microelectronic Circuits	Jan 2020-Present
Treasurer - Aerodynamics Club BITS Goa	Jul 2019 - Present
Inventory Head - Aerodynamics Club ,BITS Goa	Jun 2018 - Jun 2019
CTE Course Instructor- Introduction to Aerodynamics and Aviation Center for Technical Education, BITS Goa	Aug 2019–Dec 2019

VOLUNTEERING EXPERIENCE

Registration Coordinator Academic Undergraduate Studies Division BITS Pilani,Goa	Aug 2018-Present

CERTIFICATIONS

C programming	CTE,BITS GOA
Computer Vision	Coursera
Data Science	Coursera
Python for Data Science and AI	Coursera
Introduction to Robotics	CTE,BITS GOA
Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning	Coursera
State Estimation and Localization for Self-Driving Cars	Coursera

SCHOLARSHIPS

ESSA Merit Scholarship	Army Welfare Education Society

PUBLICATIONS

BCI Controlled Quadcopter using SVM and Recursive LSE Implemented on ROS	Accepted in IEEE Systems, Man and Cybernetics,2020
Perception Open3D – Lightning Talk	ROS World, 2020

AWARDS

Prof. Suresh Ramaswamy Memorial Award	BITSAA International, 2019
Runners-Up uC-Mania Arduino Open	Quark, BITS Pilani, Goa 2020
Winner Mayday Mystery	Quark, BITS Pilani, Goa 2018

RESEARCH INTERESTS

Aerial Robotics, Automation, Computer Vision, Digital Image Processing, Path Planning, Brain Computer Interface, Embedded Systems