Dimple Bhuta

Website | Email | LinkedIn | GitHub | +917506084465

EDUCATION

Virginia Common Wealth University   Richmond, VA, USA
Master of Science in Biomedical Engineering, (GPA:3.828/4.000, Top 10 % in class)   *Aug. 2009 – May 2012*

K.J.Somaiya College of Eng/ Mumbai University   Mumbai, INDIA
Bachelors of Engineering in Electronics   *Aug. 2005 – May 2009*

WORK EXPERIENCE

Senior Engineer – State Estimation and Control   June 2022 – Present
Technology Innovation Hub for IoT and IoE (TIH-IoT), IIT-Bombay   *Mumbai, India*

- Leading a team of engineers to develop, implement and test a sense and avoid solution for quadcopter's with the application of spraying in precision agriculture.
- Implemented odometry calculation for ground robot using encoders and orientation sensors.
- Implemented position estimation of a multi-rotor UAV using a depth camera
- Skills : Python, Robot operating system (ROS), Gazebo, Micropython

Senior research fellow   March 2019 – August 2021
Autonomous Robots and Multi-robot Systems Lab, System and control engineering, IIT-Bombay   *Mumbai, India*

- Conceptualized and developed path planning, trajectory tracking algorithms for autonomous mobile vehicles to navigate predefined areas in the map
- Implemented static and dynamic obstacle avoidance
- Assisted in analyzing patrolling algorithm for secured patrolling of selected areas
- Implemented a code base to integrate developed algorithms using robot operating system (ROS) and webots simulator
- Skills : Python, Robot operating system (ROS), Webots Simulator, Matlab

Software Developer   July 2018 – January 2019
AISIGHT video analytics pvt ltd./AITOE Lab   *Mumbai, India*

- Worked with a team of engineers to develop vision-based surveillance systems deployed in ATMs
- Developed image processing algorithms and deep learning models for human detection and tracking in videos/ live-stream
- Worked on logical and deep learning algorithms to tackle anomaly detection
- Skills : C++, OpenCV, Python, Tensorflow, PyTorch

Drone and Robotics Engineer   December 2017 – June 2018
Dhristi works   *Mumbai, India*

- Worked on developing motion planning algorithms for a manipulator (7 Degree of freedom) with an intended application of beach cleaning
- Implemented household object detection using Kinect camera and point clouds, motion planning to reach the goal object position and optimal grasp detection for house hold objects
- Skills : Python, ROS, Gazebo Simulator

Research assistant   March 2016 – March 2017
Singapore Institute of Neurotechnology, National University of Singapore   *Singapore*

- Designed slip control experimental setup with WidowX robot (under the guidance of post-doctoral fellow), to emulate human reflexes in case of slip conditions. Implemented Simulink model to read sensor data for a customized WidowX robot gripper, and control the gripper's position every 0.01 seconds.
- Developed a haptic glove and a graphical user interface, with an aim to render and replicate the sense of touch. Designed a first-generation interface between the tactile and the haptic glove to enable a user to feel the object gripped by the robot.
- Developed motion planning algorithms for the Universal Robots (UR10) to perform day-to-day tasks such as picking up the coin, bread cutting and opening the corkscrew for wine bottle.
- Skills : C++, Matlab, Simulink, Python, Altium Designer (PCB Design Software)

Project Assistant August 2015 – December 2015

Multimodal Perception Laboratory, International Institute of Information Technology *Bangalore, India*

- Compared algorithms for segmentation of jewelry in images.
- Implemented Grab cut algorithm with modifications to achieve segmentation task.
- <u>Skills</u> : C++, OpenCV

Assistant Professor August 2014 – April 2015

Electronics and Communication Engineering, Haryana College of Technology and Management *Haryana, India*

- Taught courses on digital signal processing, and microprocessors and interfacing.
- Conducted labs on digital signal communication, and microprocessors and interfacing to facilitate student's grasping of topics taught in the course.

Project Manager - Embedded Software Engineer September 2012 – April 2013

Infinite Biomedical Technologies *Baltimore, USA*

- Conceptualized and engineered a pattern recognition based prosthetic arm which successfully classified hand-open, close, flex, extend, pronate, supinate and hook hand positions using subject's EMG signals. The aim of this project was to assist trans radial amputees to control their prosthesis.
- Implemented best practices with developers to streamline communication protocols between arm and remote GUI interface
- <u>Skills</u> : C++

Research Experience

Brain controlled switch (MSc Biomedical Engineering thesis) | *Embedded systems*   August 2010 – May 2012
- Developed a single channel stand-alone device which processes the EEG signals in real time and determines whether the user wishes to switch ON/OFF the lights of the room they are in

Design of cipher (BE Electronics Engineering thesis) | *VHDL, Cryptography*   August 2008 – May 2009
- Designed a secured cryptographic system by combining DES algorithm and the 64-bit Fibonacci LFSR. Implemented this system using VHDL and tested it using FPGA kit.

Technical Skills

Languages: Python, C/C++
Frameworks: Robot operating system (ROS), Pytorch
Microcontrollers and developers kit: ARM, Arduino, Microchip PIC, Raspberry Pi, NVidia's jetson kits
Udacity Nanodegree: Computer vision, Deep learning
Others: Altium Design Summer, KiCad