RAKSHITH SUBRAMANYAM

914 E Lemon St, #110, Tempe, AZ 85281
https://www.linkedin.com/in/rakshith-subri
www.github.com/Rakshith-2905
(480)-543-0995
rakshith.subramanyam@asu.edu

EDUCATIONAL QUALIFICATION

Arizona State University, Tempe, Arizona Aug 2016 - Current
Master of Science in Electrical Engineering- Major in Control systems GPA – 3.72/4

SRM University, Chennai, India Aug 2012- May 2016
Bachelors of Technology (B. Tech), Mechatronics Engineering GPA – 8.87/10

Relevant Courses: Linear Systems Theory, Computer Control Systems, Feedback Systems, Perception in Robotics, Introduction to Electric and Autonomous Vehicles, Artificial Neural Computations, Multivariable Control Systems, Image Processing, Linear Algebra and Convex Optimization

SKILLS

Proficient in ROS, Python, Tensorflow, C++, Arduino, Eagle, Matlab, LabVIEW, Simulink, Solidworks and Linux.

MASTER'S PROJECTS

Self-Driving Car test bed, Master's Thesis, Arizona State University May 2017 – May 2018

- Made an **emulation of self-driving** car using a swarm of differential drive robots equipped with camera, 8-point IR sensors and odometer.
- Using **Image Processing** Techniques made the robot follow lane, detect changes in traffic lights, detect other cars on the road, predict their current state, communicate with the intersection and the user.
- Established an Ad-Hoc network to enable V2X communication.
- Constructed a miniature test-bed using projections with roads and traffic lights to test human vehicle interaction.

sUAS Innovation challenge , Arizona State University December 2017 - May 2018

- Developed a swarm of drones to be used by first responders for performing search operations in a disaster zone.
- The system uses an optimization algorithm to schedule search areas for each drone based on various parameters.
- The drone video is relayed back using a multi hop Ad-Hoc network, the video is used to detect humans.

Cart-Pole Balancing by Reinforcement Learning, Arizona State University August 2017 – December 2017

- Wrote a **URDF** (Universal Robot Description Format) to create a cart pole model in ROS.
- Trained **Policy gradient** model in 34 trials to balance the cart pole for 60,000-time steps.

Facial recognition based home security system, Arizona State University May 2017

- Used **Harr Cascade** for real time face identification.
- Trained a **LBPH** (Local Binary Pattern Histogram) for classifying faces to unlock a door. Used LBPG to classify facial emotions to control the temperature of lights in a room.

Centralized Control of Robots Using Active Perception, Arizona State University Jan 2017 – May 2017

- Designed and constructed a swarm of heterogeneous autonomous robots (aerial and ground) framed over ROS for painting football fields.
- Programed the ariel master to do **real time object tracking** and commanding the ground robots. Ground robots used **PID controller** to track the commands of the master

Lab2Moon, Arizona State University Jan 2017 – March 2017

- Designed a **cyanobacteria monitoring system** which actively monitors and maintains desirable conditions for the cyanobacteria to culture on **Moon**.
- Presented the Project in India and secured a launch to moon in December 2017.

UNDERGRADUATE PROJECTS

VAYU-Vertical Take off and Landing Aircraft (Senior Thesis), Chennai, India Dec 2015-March 2016

- Designed and manufactured a **hybrid VTOL** aircraft using Solidworks based on the principles of delta wing and propeller lift.
- Formulated a self-adjusting **PID tuning algorithm** to stabilize the aircraft in case of propeller failure.
- Engineered a microcontroller board on Eagle which can work both on AC and DC power and can tolerate various signal levels. Made a **dynamic camera stabilization** system using brushless motors and servo motors.

CanSat Annual Competition, Burkett, Texas Aug 2014 – June 2015

- Led a multidisciplinary team to build a **miniature satellite** traveling through the planetary atmosphere sampling the atmospheric composition. Secured **world rank 1** in design reviews and managed the end to end project plan and complete finance of $20000.
- Designed a new method of Autogyro landing system for controlling the speed of re-entry of the satellite and developed the control algorithm to stabilize the system.
- Developed a concept of **altitude determination using the magnetic field strength** to aid the barometric altitude sensor during a random variation in the environmental pressure.

ABU Robocon, Pune, India Aug 2013- March 2016

- Designed various PCBs in Eagle which were mainly used as Power distribution boards and Microcontroller interface boards.
- Engineered a low-cost shuttle detection mechanism using long range IR Sensors for badminton playing robots.
- Developed mapping algorithms for arena mapping and implemented **PID control algorithm** for a smooth robot operation.
- Efficiently managed a $15000 project budget and was awarded with the *Best Economical Robot award*.

PROFESSIONAL EXPERIENCE

ACS Lab, Arizona State University, Tempe, USA January 2017-Present
Graduate Student Researcher

- Developing human stations for the self driving car test bed.
- Wrote a program based on TCP/IP to control a swarm of robots using a single joystick.
- Working on converting the programs written on Arduino to ROS for Pheeno, a swarm robotic research platform

Luminosity Lab, Arizona State University, Tempe, USA August 2016-Present
Hardware Design Engineer.

- Created multiple house models in ROS resembling a house to train a ML model to aid blind people navigate.
- Programing a educational ground robot to do face recognition, trajectory control and controlling a 3 DOF robotic arm.
- Wrote a program that creates a **hexagonal map of ASU** campus and distinguishes fly and no fly zone using the data of building elevation.
- Developed a human monitoring system based on **IOT** which includes a camera, health monitoring system and active ambience control system.
- Conceptualized an autonomous coffee shop based on work shop autonomy.
- Designed electronics for a Smart interactive mirror and wrote the rudimentary code for the Linux background system.

Lab Designer and Teaching Assistant,System Dynamics and Controls, Arizona State University Summer 2017

- Included instructional introduction to applied robotics to the undergraduate course MAE 318.
- Scripted an experimental system identification method and controller design for a differential drive robot.

E-Board- Startup, Chennai, India June 2014 – July 2016
Co-Founder.

- Was the Lead Technical and Electrical design head for designing and manufacturing electric vehicles.
- Developed a novel mechanism for reversing a BLDC motor which operates on the command of the user via Bluetooth.