

Education

University of Massachusetts, Amherst

Master of Science • GPA: 4 / 4

May 2020 (Expected)

The University of Utah, USA

Rehabilitation Robotics, Bachelor Thesis Research • GPA: 4 / 4

Jun 2017 – Dec 2017

Birla Institute of Technology and Science Pilani (BITS), India

B.E (Honors) in Mechanical Engineering • GPA: 7.1/ 10

May 2018

Relevant Skills

Programming: C/C++, Python, MATLAB, LabVIEW

Software & Microcontrollers: Arduino, Raspberry pi, Latex, Solid works

Course Work: Artificial Intelligence, Machine Learning, Simulation Based Optimization, Embedded Computing Systems

Experience

Robotics Intern, Bionic Engineering Lab, University of Utah

Jun 2017 – Dec 2017

Calibration Algorithms, Sensor Fusion, Position Tracking, Kalman & Complimentary filter;

C++, MATLAB, LabVIEW

- Developed a calibration algorithm for inertial sensors using analytical models to reduce error of the raw output from 50% to 3%
- Developed a wireless motion analysis system using inertial sensors (IMU) and Wi-Fi module to capture kinematic data of gait cycle from amputees with minimum discomfort in usage.
- Developed a displacement estimation algorithm using complimentary filters & sensor fusion to track position with 98% accuracy for planar motion of the device.

Projects

Artificial Intelligence Projects, UMass Amherst

Dec 2018 – Current

Neural Networks, Search Algorithms, Optimization Algorithms;

Python, MATLAB

- **Integer Sequence Prediction** using unsupervised learning (Function approximation, RNN, clustering) -**Active**
- **Inertial sensor Calibration:** Developed a calibration algorithm for inertial sensors using convolutional neural networks reducing the error from 50% to 0.5% which is more efficient compared to my previous algorithm
- **TIC-TAC-TOE:** Designed a Tic Tac Toe bot using convolutional neural networks and genetic algorithm

Embedded Computing Systems Project, UMass Amherst

Sep 2018 – Dec 2018

Cruise Control, Obstacle Avoiding, Lane Keeping, Path Planning;

C++, Python, MATLAB

- **Light sensing robot:** Built a light sensing robot with four behaviors (Light attacking, avoiding, loving, escaping). without micro controller just using photo resistors and hardware logic.
- **Self-Driving Robot:**
- Implemented lane keeping using lane and edge detection algorithms; Detected traffic lights using color detection
- Designed cruise control and obstacle avoidance systems using ultra-sonic sensor and implemented path planning algorithms such as Dijkstra's to find optimal path for the robot.

Self-Reconfigurable Modular Robots, BITS Pilani

Jan 2016 – May 2017

Biomimetic Structures, Gear Box Mechanism, Motor Control Algorithms;

C++, LabVIEW, SolidWorks

- **HexaMob:** Developed a new robot (HexaMob) by analyzing the limitations of SQ bot, which has more degrees of freedom and its robust design enables it to form biomimetic structures like snake, centipede etc
- Designed the gearbox mechanism required to stop back driving which minimizes power consumption of HexaMob
- Developed motor control algorithms in LabVIEW for locomotion of the chain structures formed by the bots

Publications

- Chennareddy, S.S., Patlolla, S., Agrawal, A., & Anupama, K.R. (2017). HexaMob - A Hybrid Modular Robotic Design for Implementing Biomimetic Structures. Robotics, 6, 27.
- C. S. Sankhar. Reddy, Sharath Patlolla, A. Agrawal and K. R. Anupama, "SQ-BOT - a modular robot prototype for self-reconfiguring structures", IEEE Xplore Digital Library