Curriculum Vitae

Personal Information

Name Prakyath Kantharaju
Date of Birth *June 8th, 1995*
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Education

fall 2019 **PhD student in Mechanical Engineering** *University of Illinois at Chicago*, USA

- Specialization in wearable robotic devices for rehabilitation and assistance using machine learning models.
- lab: Rehabilitation robotics lab, MIE, UIC
- Doctoral advisor: Dr. Myunghee Kim

2017–2019 **Masters Degree in Mechanical Engineering** *University of Illinois at Chicago*, USA

- Specialization in Robotics and Controls
- GPA: 4.0/4.0

2013–2017 **Bachelors degree in Mechanical Engineering** *Visvesvaraya Technological University* Bangalore, India

- GPA: 3.56/4.0

Research Experience

June 2019 - current **Wearable robotics and metabolic estimation**

- Machine learning based fast steady-state metabolic cost estimation method.
- Exoskeleton assistance for squatting, walking, and running activities.
- Human in the loop optimization for subject specific exoskeleton assistance.
- Walking speed-specific assistance using model-based speed estimation and activity classification system.

Jan-June 2019 **Model based Reinforcement learning**

- Applying Guided policy search for locomotion of robots and Humans
- Using the Gaussian mixture model and other stochastic machine learning techniques to predict model dynamics.
- Developing adaptive dynamic programming controller to control under-actuated system such as humanoid robot.

Jan-Dec 2018 **Real-time implementation of highway lane merger using MPC for autonomous vehicle.**

- Non-linear Model predictive controller using direct multiple shooting method for trajectory optimization.

o Developed a test bench to test various autonomous control algorithm using ROS.

Feb-2018 **Object detection and Navigating using CAN bus for Autonomous vehicle.**

o Implemented communication and sensor fusion of LIDAR and Camera using CAN bus

o Development of Controller and algorithm for object avoidance and turning.

Work Experience

2018– current **Graduate Research and Teaching Assistant** *University of Illinois at Chicago.*

o Helping graduate and undergraduate student with python programming for data science and machine control.

o Setting up lab equipment for graduate students to perform experiments in the mechatronics research lab.

July 2016 **Design Internship** Rail Wheel factory, Government of India.

o Analyzed the performance of the diesel-powered furnace.

o Designed bio-fuel stove using design software such as Creo and Solidworks.

Publication

TNSRE 2022 **Reducing squat physical effort using personalized assistance from an ankle exoskeleton**

Scientific report 2022 **Foot contact forces can be used to personalize a wearable robot during human walking**

IEEE Access (In review) **Phase-plane based model-free estimation of steady-state metabolic cost**

Academic Projects

Fall 2018 **Neural Networks and Machine learning**

o Learned and programmed neural networks and machine learning algorithms such as fully connected networks, CNN, RBF, SVM using Back Propagation and Gradient descent from ground up. Link to the project here.

Spring 2018 **Implemented motion planning algorithm**

o Implemented path-finding algorithm on fixed obstacle environment using encoders and IR sensors. Link to project here.

Spring 2018 **Closed loop position and speed control using the DC motor**

o Used encoders to implement the position and speed control of the motor using PID. Link to project here.

Fall 2017 **Monte Carlo simulation of structural element using MATLAB**

o Monte Carlo analysis of the displacement and determining the probability distribution of the failure of the structural element. Link to project here.

Skills & Background knowledge

Programming Python, MATLAB, SIMULINK, ROS, OpenCV, Git, Pytorch , Tensorflow, CUDA.

Hardware Raspberry Pi, Arduino, Speedgoat, Camera, IMU, LIDAR, Sonar.

Design Creo, Catia V5, Solidworks, Ansys, SolidEdge.