

# KARAN PANDYA

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## EDUCATION

### University of Illinois at Urbana-Champaign (UIUC)

Master of Engineering in Autonomy and Robotics GPA 3.89/4.0

Champaign, IL

August 2023-25

### Visvesvaraya National Institute of Technology (VNIT)

Bachelor of Technology | GPA: 8.07/10

Nagpur, India

April 2018-22

## EXPERIENCE

### Sunfuel Electric, May 2021-22 (Product Development Intern) [\[Project Link\]](#)

- Developed industrial design prototypes for a 3.3KW AC Electric vehicle charger. (WALLBOX).

### IvLabs- Robotics and A.I club, V.N.I.T (2018-2022)

- Designed a novel joining mechanism for *ReQuBiS* robot using stress strain analysis & programmed robot locomotion gaits using inverse kinematics and D-H parameters under Prof. Shital Chiddarwar.

### Department of Electronics & Communication Engineering, V.N.I.T, Oct-Dec 2020 (Mechatronics Intern)

- Under the guidance of Prof. K.M. Bhurchandi, developed the CAD design for a health monitoring smartwatch that integrates a microcontroller, SpO2 (oxygen) & heart rate sensor. [\[Link\]](#)

## PATENT/PAPERS:

### ReQuBiS - Reconfigurable Quadrupedal-Bipedal Snake Robots [\[Paper\]](#) [\[Video\]](#) Oct 2019 – Nov 2020

- Designed unique snake robots capable of re-configuring into quadruped/biped without re-arranging modules; thus, achieving best of both robot capabilities.

### PixGuide (Patent Pending) [\[Project Link\]](#) [\[Video\]](#) Inventor/ Team leader

- Explored and studied the need of the market to develop a smart navigational gadget that offers real-time navigation without interruptions.
- Karan Pandya**, Et al.(2019). Navigation System for a vehicle and a method for navigation. Intellectual Property India. CBR Ref. Number: 201921049473. [\[Doc\]](#) [\[Link\]](#)

## PROJECTS:

### SuperCropSLAM Oct-Dec 2023 (UIUC) [\[Link\]](#)

- Implemented Visual SLAM on TERRESENTIA agricultural robot for mapping and localizing the robot in GPS denied environments via self supervised learning.
- Improved the robots Absolute trajectory error (ATE) by 10% and Enhanced feature tracking by 80% Generated point cloud map of the environment using ORB-SLAM3 and VINZ-FUSION.

### F1-Tenth (Vision based collision avoidance) Sep-Dec 2023

- Developing a fully autonomous racing car (1/10th the size of F1 car) using intel real sense D435i camera.
- Implemented a dynamic obstacle avoidance algorithm using A\* search.
- Optimized lane detection using adaptive thresholding to accurately detect lanes in reflection and noise

## SKILLS

**Programming:** Python, C, C++, MATLAB

**Software and Libraries:** ROS1 & 2, RVIZ, Gazebo, Git, SolidWorks, OpenCV, Numpy, Matplotlib

**Tools:** Nvidia Jetson Nx computer, STM32, Real sense D435i camera

## COURSEWORK

- Deep learning, Applied Machine Learning: Multi-class perceptron, Multi-class SVM, Softmax.
- Optimization using SGD with momentum, RMSProp, Adam, Regularization.
- Optical flow, Structure from motion, Multi-view stereo, Camera calibration.
- Sensor fusion algorithms including Kalman filters, Particle filter and monte carlo localization
- Object recognition using Histogram and surface normals and supervised machine learning algorithm(SVM).
- Udacity Robotics Software Engineer Nanodegree.