AKASH KUMAR SINGH

ksakash@iitk.ac.in | +91-7318019013 | Github:ksakash

EXPERIENCE

GOOGLE SUMMER OF CODE | Robocomp

May 2018 – Aug 2018 | MENTORS: Marco A Gutiérrez and Ramon Cintas

- The project aims to integrate Robocomp, a robotic framework, with a 3D robotic simulator, Gazebo, using zeroc-ice as a communication middleware.
- Used gazebo plugins for robotics interfaces, corresponding to different sensors and actuators, to communicate with the Gazebo simulator.
- The integration will allow developers more options from the framework and provide a better simulation with a more realistic physics engine.

TRAFFIC LIGHT DETECTION USING DEEP LEANING | NYU-IITK Research Track

June 2018 – July 2018 | Prof. Yi Fang (New York University)

- The project aims to develop a light weight traffic light detection model based on Deep Learning, using various using various model compression techniques.
- Developed a R-FCN (Region Based Fully Connected Network) model using object-detection tensorflow apis.
- Built a feature extractor, using keras, to extract high level features from a trained network, in order to build the meta architecture R-FCN on top of it and retrain it using transfer learning.

AUTONOMOUS UNDERWATER VEHICLE | underwater robotics team, iitk

February 2017 – Present | MENTOR: Prof. Mangal Kothari

- Developed a image processing pipeline, which can enhance raw underwater images coming from the live video stream through a camera, denoise it and threshold it, to get essential information about objects present before the bot.
- Developed Vision Processing ROS package using OpenCV library and implemented in c++, in order to perform particular tasks in SAUVC 2018.
- Worked on Feature Extraction and Matching using various algorithms like SURF, SHIFT, etc. to recognize a known object in a particular scene.
- Working on developing image enhancement techniques for underwater images.
- Developed a PID based controller for the vehicle to achieve a particular state and configuration for the robot.
- Developed motion module for the robot, using actionlib provided by ROS, which is responsible for moving the robot on getting a goal from the vision module.

TIC-TAC-TOE | Reinforcement Learning

November 2017 - April 2018| Prof. Nisheeth Srivastava

- The project aims to help an artificial agent learn to play tic-tac-toe game with the help of a reinforcement learning algorithm called Temporal Difference Learning.
- Further we used the technique of representing the states by set of feature vectors to reduce the state space in order to reduce the time complexity of the algorithm used.

CLUB AUTOMATION | Winter Camp

December 2016| Robotics Club, IITK

- Developed a motion detector automate the light switching in a room using Arduino and PIR sensors to prevent any electricity wastage.

EDUCATION

INDIAN INSTITITE OF TECHNOLOGY, KANPUR | B.Tech in Electrical Engineering

July 2016- April 2020 | Kanpur, Uttar Pradesh (INDIA)
CPI : 8.1/10

D.A.V. PUBLIC SCHOOL, NTS BARKAKANA, C.C.L. | AISSCE

June 2014 - March 2016 | Ramgarh, Jharkahnd (INDIA)
Result : 93.4%

D.A.V. PUBLIC SCHOOL, URIMARI | AISSE

March 2014 | Hazaribagh, Jharkahnd (INDIA)
CGPA : 10/10

SKILLS

Image Processing • Computer Vision • Linux Command Line • Robotics • 3D simulation

LANGUAGES

C • C++ • Python • LATEX • HTML • CSS • Typescript • shell(bash)

TOOLS

ROS • OpenCV • Git • SolidWorks • Arduino • Gazebo • zeroc-ice • Angular • Tensorflow • Keras • GNU octave

SCHOLASTIC ACHIEVEMENTS

Secured rank 3146 at National level in JEE Mains 2016.
Secured rank 2477 at National level in JEE Advanced 2016.

COURSES

Introduction to probability and Statistics
Control Systems
Introduction to Microelectronics
Signal, Systems and Networks
Essentials of Scientific Computing
Introduction to Electronics
Principles of Communication (Upcoming)
Data Structures and Algorithms (Upcoming)

OTHER CAMPUS ACTIVITIES

Secretary, Robotics Club, IIT Kanpur | July 2017 - Mar 2018
Secretary, Fine Arts Club, IIT Kanpur | July 2017 - Mar 2018