AKASH KUMAR SINGH

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WORK EXPERIENCE

GOOGLE SUMMER OF CODE | Robocomp

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

- The project aimed 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 is expected to 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 aimed 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.

FRONTEND DEVELOPEMENT | New York Office, IIT Kanpur

December 2016| Prof. Manindra Agrawal

- Developed new features and improved UI/UX of a scalable web application.
- Used latest technology stacks like TypeScript in Angular 6 as well as HTML and SCSS for styling while following reactive paradigm using NgRx.

PROJECTS

AUTONOMOUS UNDERWATER VEHICLE | underwater robotics team, iit kanpur

February 2017 – Present | Prof. Mangal Kothari

- Developed an image processing pipeline, which can enhance raw underwater images coming from the live video stream through a camera, to get essential information about objects present around the robot.
- 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.
- 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) | iit kanpur

November 2017 - April 2018| Prof. Nisheeth Srivastava

- The project aimed 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 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 | Robotics Winter Camp

December 2016| Robotics Club, IIT Kanpur

- Managed to count the number of people inside a room using PIR sensors so that all electric devices can be turned off in case room is empty.
- Used Arduino as a microcontroller in order to read data from sensors and perform calculations.

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 (Under Progress)
Data Structures and Algorithms (Under Progress)

OTHER CAMPUS ACTIVITIES

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