AKASH KUMAR SINGH

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EDUCATION

INDIAN INSTITITE OF TECHNOLOGY, KANPUR | B.Tech in Electrical Engineering
July 2016- April 2020 | Kanpur, Uttar Pradesh (INDIA)
CPI : 8.2/10

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

WORK EXPERIENCE

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.

TRAFFIC LIGHT DETECTION USING DEEP LEANING | NYU-IITK Research Track
June 2018 – July 2018 | Prof. Yi Fang (New York University)

- The project aimed to build and design a lightweight traffic light detection model based on Deep Learning.
- Built a CNN using a real time object detection algorithm called RFCN using tensorflow object detection apis.
- Proposed model compression techniques to reduce the size of model and latency.

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 to provide access to different components in a simulation like sensors and actuators, and sharing the data from the simulator using ice-interfaces.
- The integration is expected to allow developers more options from the framework and provide a better simulation with a more realistic physics engine.

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.

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.

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.

RESEARCH INTERESTS

Robotics • Reinforcement Learning •Computer Vision • System Controls

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

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

POSITIONS OF RESPONSIBILITY

SOFTWARE TEAM HEAD | AUV-IITK, IIT Kanpur
February 2018 – Present

- Leading the software team to develop a robust software stack for a semi-autonomous underwater vehicle.
- Managing the software team to prepare for AUV competitions at Chennai and Singapore in January and March 2019 resp.

SECRETARY | Robotics Club, IIT Kanpur
April 2017 – March 2018

- Involved in the promotion of Robotics in the campus community.
- Assisted coordinators in organizing workshops, lectures and tutorials and general upkeep of the club.