

# AKASH KUMAR SINGH

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## 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 LEARNING | 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 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.

### 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 INSTITUTE 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, Jharkhand (INDIA)

Result : 93.4%

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

March 2014 | Hazaribagh, Jharkhand (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

Data Structures and Algorithms (Upcoming)

## OTHER CAMPUS ACTIVITIES

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

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