Akhilesh **Kumar**

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Education

Jaypee University of Information Technology

Solan, India

B.Tech, Electronics and Communication Engineering | CGPA 6.5/10.0 — *July 2016 - 2020 (Expected)*

Projects

Real time Lane and Vehicles Detection

Aerial and Underwater Robotics Society — *Sept 2017 - Present*

- A computer vision software pipeline built on top of Python to identify vehicles in a video.
- Computes the camera calibration matrix and distortion coefficients for distortion correction to raw images.
- Uses color transforms, gradients, Sobel, HOG feature extraction on a labeled training set of images, Vehicles classifier and Linear SVM classifier.
- Works as a pipeline on a video stream to create a heat map of recurring detection frame by frame to reject outliers and follow detected vehicles
- Determines the curvature of the lane and vehicle position with respect to the center.

Ebook to Audio convertor using NLP and Google Speech

ACM Electronics Team — *Sept 2017*

- Developed an ebook to audio convertor using python.
- Implemented NLP for summarizing the stories, enabled to save audio outputs at mp4 locally, saves summaries in pdf or txt formats.
- Used Tkinter to develope GUI for the application.
- Won the Runners up appreciation prize at Hacksprint 2.0 at UIET, Chandigarh.

IoT based Pollution Monitoring and Waste Management for smart cities

ACM Electronics Team — *May 2017 - Jun 2017*

- Established communication between dustbins across the city with server on web using xbee modules on Raspberry Pi.
- Conceptualized the Route Optimization using Google maps. Used GPS Gtop.19 modules to interface the GPS data with program.
- Backend of program runs on flask and frontend on nodered UI.

Motion Imitating and Path Replicating Robot

ACM Electronics Team — *Mar 2017 - Apr 2017*

- Arduino based Bot interfaced with Raspberry Pi capable of imitaing paths directed using aprilTags.
- Bot uses camera for input to handle controls using OpenCV. Developed python client for real time video stream.

Underwater Glider for Real Time Mapping with SensorTag IoT System

ACM Electronics Team — *Dec 2016 - Jan 2017*

- Accomplished automated glider controlled movement with a ballast system.
- Developed obstacle-avoiding feature and algorithm for mapping of environment using MATLAB
- Interfaced TI CC2650STK SensorTag with Raspberry Pi to retrieve data in real time.

Certifications

Robotics Specialization

Coursera | University of Pennsylvania — *Jun. 2017 - Present*

- Pursuing Robotics Specialization coursework from coursera. Already completed 5/6 courses.
- Completed courses on Aerial Robotics, Robotics: Computational Motion Planning, Robotics: Mobility, Robotics: Perception and Robotics: Estimation and Learning
- Working on Capstone project on Autonomous Robot Track which is a major project required to complete the specialization. It includes simulation, Path Planning, Sensor calibration, Designing of control algorithms and Extended Kalman filter to navigate autonomously through designed environment
- Learned various aspects of Designing, Simulations and controls technique of Robotics. Completed all the verified assignments on Octave, Python and ROS as part of the course.

Machine Learning

Coursera | Stanford University *August 2017*

- Successfully completed course on Machine Learning by Prof. Andrew Ng, Stanford University.
- Learned various algorithms for the foundation of Machine Learning and implemented on octave.
- Completed a Rudimentary Spam Classifier and handwritten digit recogniser Project as a part of Machine Learning Course.

Technical Skills

Languages	**Python, C++, C, Bash, TEX, Lua (Beginer)**
Libraries & Frameworks	**Flask, cv2, SciPy, NumPy, MatPlotlib, Tkinter**
Softwares	**Octave, Simulink, SolidWorks, Gazebos**
Hardwares	**ATmega, Raspberry Pi, mbed LPC1768, TI Launchpads**
Systems:	**Linux: Debian/Ubuntu, OpenCV, ROS, IoT**

Publications

Multi User Stability Controls using Monocular Vision for Unmanned Aerial Vehicles (Submitted) *Bangalore, India*

Symposium of Applied Aerodynamics for Unmanned Aerial Vehicles

(Garg M., **Kumar A.**, Singh A., Rajan M.)

Honors & Awards

2017 **Finalist**, Hacksprint 2.0 *Chandigarh, India*

2017 **3rd Place**, Exposicion - Murious XI *Solan, India*

Extracurricular Activity

ACM-JUIT Student Chapter

Member, Electronics Team *Aug 2016 to Present*

- Gained expertise in programming hardwares. Worked extensively with other members onvarious development boards
- Conducted workshops on Introduction to Programming and Robotics.

IPR Cell (Intellectual Property Rights Cell of JUIT)

Core Member *Feb 2017 to Present*

- Gained knowledge about various nuances of patent filing procedure and prevention of plagiarism and its counter measures.
- Worked with the team and helped set up an incubation cell at JUIT.

TIEDC (Technology Incubator and Entrepreneurship Cell of JUIT)

Core Team Member *March 2017-Present*

- Gained knowledge about several business field like Management, Strategy, Financial and marketing from group study.
- Gained expertise in business strategy areas and inisght for various industry from weekly industry analysis session.

Positions of Responsibility

2017 **Instructor**, ACM-JUIT | Conducted Workshop on Introduction to Robotics and Internet of Things

2017 **Co-Founder**, Aerial Robotics Society | Conducted Workshop on Computer Vision.

2017 **Co-Ordinator**, Robotics & Embedded Systems Lab | Team Leader for eYRC

2017 **Organizing Committee**, Murious XI (Annual Technical Festival)