Akash Kumar

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EDUCATION

DELHI TECHNOLOGICAL UNIVERSITY
B.Tech Electronics And Communications
Pre-Final Year
Aggregate: 8.35(Upto 5th Sem)
First Class

HOPE HALL FOUNDATION SCHOOL
CBSE Class XII, 93.6%

MILITARY SCHOOL GHORAKHAL, NAINITAL
CBSE Class X, 9.8/10

SKILLS

DL & CV FRAMEWORK
TensorFlow •OpenCV
Keras •CUDA •PyTorch
PROGRAMMING
Python • C/C++ • LaTeX
MATLAB•Embedded C

LINKS

Github:// akash29
LinkedIn:// Akash Kumar
Medium:// akash29_blog

COURSEWORK

ACADEMIC
Computer Vision
Pattern Recognition
Digital Image processing
Algorithms Design & Analysis
Advanced Mathematics(1 and 2)
OOPS Programming Fundamentals

MOOC
CAP5415,UCF Computer Vision
CS231N,Stanford CNN for Visual Recognition
CS224N, NLP using Deep Learning
CS231A,Stanford Computer Vision
Linear Algebra MIT OCW
Andrew Ng's Deep Learning Course
fast.ai Deep Learning Course

COURSERA CERTIFIED
Python & Data Structures
Image & Video Processing
Neural Networks & Deep Learning

RESEARCH INTERESTS

DEEP LEARNING IN COMPUTER VISION
- Semantic & Instance Segmentation of scenes
- Large Scale Video Classification & Video Object Segmentation.

NATURAL LANGUAGE PROCESSING
- Image Captioning and Visual Question Answering Systems in Real-Time Applications.

EXPERIENCE

CONTENT BASED VIDEO RELEVANCE PREDICTION | Researcher
April 2018 - Present | Multimodal Digital Media Analysis Lab, IIIT, Delhi
Guide: Dr. Rajiv Ratn Shah
- Developing a Video Recommender system using Content-based Information
- Evaluating baseline approaches for cold-start problems in videos uploaded on-site. Predicting the viewer-to-video relevance score and video-to-video relevance score to generate a more personalized recommendations that covers more area of interest to that person.

RELATIVE VELOCITY OF AUTOMOBILES | Research Intern
Dec. 2017 - Jan. 2018 | Multimedia Analytics & Systems Lab, IIT Mandi
Guide: Dr. Renu M. Rameshan
- Evaluated SSD Mobilenet Architecture and YOLO for object detection and tracking. Mobilenet Architecture to optimize the performance of models.
- Computed Optical Flow of the specific object class(cars). Devised a relation between Optical Flow and its relation to automobiles speed.
- Deploying deep learning models onto an App for a real-time user-based approach for detection and tracking.
- Research report: **Winter Research Report**

ROOFTOP ASSESSMENT FOR SOLAR INSTALLATIONS USING SATELLITE IMAGERY |Computer Vision Intern| The Solar Labs, Founding Team Member
June 2017 – July 2017 | Tech Start-Up, IIT Mandi, Himachal Pradesh
- Extracted the dataset of houses from Satellite images and generated dataset for deep learning.Algorithms were implemented to separate foreground and background of the images obtained from Static Maps.
- Identified **individual rooftops** using Google Maps satellite imagery.Active Contours, Polygons filling & Contours were applied to refine the rooftop shape.Area of houses was evaluated by mapping image to Google Map.
- **Achieved** placement of Solar panels on optimal location and required Orientation angle in rooftop area. All code was reviewed, perfected, and pushed to production.
- Brief Technical Report: **Internship Report**

PROJECTS

DRIVER AWARENESS ASSISTANCE SYSTEM
Feb.2018 - April.2018 | Robotics & Machine Intelligence Lab, DTU
- Developed an online system using NVIDIA Jetson TX1 to track pedestrians on road.Trained the NVIDIA Caffe DetectNet Model on DIGITS to detect and track animals.
- Explored MS-COCO dataset sub-classes to learn DetectNet & PedNet model for different classes.

CO-CURRICULAR

- Student Member of **IEEE-DTU**
- Volunteer at **NCVPRIPG '17** held at IIT- Mandi(Dec.16-19,2017).
- Participated in **E-Yantra** Robotics Competition at Techfest IIT-B.
- Participated in Inter-College Robotics Competition.

EXTRACURRICULAR

- Organizing Member of **The Indian Game Theory Society**
- Member **Football Club**
- **Swimming** , **Trekking** and **Table Tennis** enthusiast.

REFERENCES

Dr. Rajiv Ratn Shah
Assistant Professor
Multimodal Digital Media Analysis Lab, IIIT- Delhi

Dr. Renu M. Rameshan
Assistant Professor
Multimedia and Systems Lab
IIT - Mandi, India

Dr. Anil Singh Parihar
Assistant Professor
Department of Information Technology
Delhi Technological University

Mr. Aswin A.
Co-Founder
TheSolarLabs, Mandi
Noida, New Delhi, India
Website **E-Mail**

SURVEY ON REAL-TIME OBJECT DETECTION METHODS

Oct 2017- Jan.2018 | Guide: Dr.Anil Singh Parihar

- Comprehensive study on You Only Look Once(YOLO), Single Shot Multibox Detector & YOLO9000:Stronger, Faster & Better.
- Summary of Network Architectures along with frame per seconds processing speed compared to R-CNN methods.
- Described the failure of these models as well as their comparison on PASCAL VOC 2007, VOC 2012 & COCO datasets.

BOTHOVEN | e-Yantra, IIT-Bombay

Nov 2016 - March 2017
Guide: Dr.Madhusudan Singh

- Bothoven theme was about Audio Processing, Wireless Communication, Line Follower & Path Planning.
- Decoded the Audio file using Python and serially transmitted data to one robot.Ultrasonic and IR Sensors were tested to detect obstacles randomly placed in the arena.
- Devised Zigbee Communication protocol between two robots to control the robot's movement to a nearby musical node.Graph Algorithm were tested to complete the task within minimum span of time.
- Organized calibrated movement of servo motors, a striking mechanism was developed to reproduce musical sequence comprising different notes striking different length of rods.
- Video Link: **e-Yantra Task Demonstration Video**

INFERNO DTU | Embedded & Machine Vision Dept.

March 2016 – March 2017 | Dept. Head, Technical Team, DTU

- Automated update of fuel level of the go-kart with sensor alert for the low level of fuel was created using Ultrasonic Sensor and GSM Module.
- Devised a mechanism to control speed, according to the distance between the obstacle and the kart.
- Organised interfacing between GSM Module, Engine temperature & Fuel leakage system to manage the kill switch.
- Monitored required speed using RPM data for brake test.

ENERGY EFFICIENT SMART TRAIN | Texas Analog Design

Aug 2016 – Nov 2016

- Designed coaches that can produce energy on its own with the help of alternator on wheels.
- Devised a plan to control pollution and efficiency in energy consumption as 4% of India's air pollution is caused due to Railways.
- Micro-controller based system that provides Smart Lighting, Anti-fire, Gas leakage system & Anti-theft system using Barcode Scanner.
- Project Abstract: **Technical Report**

AWARDS AND ACCOMPLISHMENTS

- Best **Innovation Award** in Indian Go-Karting Championship(IGKC)-2017.
- Selected among **Top-50** /2500 teams in e-Yantra, IIT Bombay Competition.
- Secured **All India Rank-9091** among 1.5 million candidates in IIT-JEE Mains examination 2015.
- Secured **Rank-14** in NTSE Stage-I among 5.2K candidates appeared.
- Secured **1st Rank** in Sainik School Ghorakhal Entrance Exam.