Arjun Chauhan

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EDUCATION

Manipal Institute of Technology, Manipal, India **Jun 2020**

Secured a Bachelor of Engineering in Electronics and Communication with Minor in Data Science **(CGPA: 8.62/10)**

Relevant coursework: Computer Vision, Motion and Geometry Based Methods in Computer Vision, Linear and Digital Control Systems, Microcontrollers, Data Science, Advanced Data Science, Probability and Statistics, Calculus.

PROFESSIONAL EXPERIENCE

IOTrics, Gurgaon, India **Aug 2020 - Present**

Intern, ThirdEye Data Science and Computer Vision Team

- Implemented an end to end 3D reconstruction model which will be employed in the next generation of ThirdEye AR glasses
- Developed, trained, and deployed CNN model to scale for mask detection with an accuracy of **95%** which is being used by 200 people per day on an average.

Myelin Foundry, Bengaluru, India **Dec 2019**

Intern, Super Resolution Pipeline

- Applied deep learning algorithms such as ESPCN and SRGAN to reduce bandwidth requirements for Over the Top (OTT) streaming services for Hotstar (a leading OTT provider in India)
- Aided in implementing and optimizing image filters to improve visual quality of videos at the edge.
- Improved VMAF score by 30 units.

Karel Electronics R&D, Ankara, Turkey **Jul 2019**

Intern, ADAS System

- Developed a traffic collision avoidance system for cars to detect oncoming traffic and pedestrians using Haar Cascades, Optical Flow and Multi-object tracker to enhance road safety.
- Integrated rear-view camera displays with a buzzer to warn the driver about any threats on roads.
- Demonstrated the system to FIAT, Turkey at a meeting between Karel Electronics and FIAT.

Karel Electronics R&D, Ankara, Turkey **Jul 2018**

Intern, ADAS System

- Developed a surround view system using 4 cameras to work simultaneously to get an overall composite video feed with the next generation rear-view cameras (instead of mirrors) in cars using OpenCV, V4L2, Driver Programming and C on an in house developed embedded platform.
- Implemented calibration and homography transforms for seamless merging of feeds.

PROJECTS

DeepRivWidth : Applying Semantic Segmentation for River Width Measurement in SAR Images *(Thesis)*

Guide: Dr. Ujjwal Verma, Dept of ECE, MIT, Manipal

- Implemented and analysed UNet and DeepLabv3+ on SAR Images to identify land and water in SAR Images
- Attained an accuracy of **93%** (Unet) and **98%** (DeepLabv3+)
- Developed a distance measuring algorithm using morphological transformation and eucledian distance measurement. Obtained an average error of 22 meters.
- Observed temporal data to aid municipality determine strategies to allocate water.

Rescue Bees *(Coursera Show-a-skill Challenge)*

- Developed an algorithm to detect people in distress using a swarm of drones aimed at aiding rescue and relief operations during natural calamities using Ardupilot, ROS, and Tensorflow.
- Incorporated an algorithm to geocode images and relay it back to base station and developed an application interface to plot and show these images.

No-Permission-No-Take off (NPNT) System *(IIT-B Techfest)*

- Developed a modular unit to enforce government drone regulations on the flight controller making it compulsory for the drone to return to base if any regulation was violated.
- Incorporated an algorithm to monitor operating parameters of the drone and plan the path on detecting violation.
- Analysed the simulation using a System-In-The-Loop (SITL) before final hardware implementation.

Automated Orthomosaic Generation and 3D Model Construction using Aerial Imagery *(TATA Solverhunt 2 Challenge)*

- Developed an approach to plan route and capture images using drone as well as to provide an orthomosaic image and 3D Model. Demonstrated this system to TATA Steel for their inspection purposes.
- Implemented using Ardupilot, SITL simulation, ROS and OpenCV.

Intelligent Home Intruder Detection System *(ECE 3111: Microcontroller Lab)*

- Designed and implemented an intelligent home security system using an ATMega 328P with a Real Time Clock module (through I2C), keypad and LCD.
- Incorporated a functionality to detect an intruder based on the type of error made while entering the code.
- Enhanced the security with features to detect an intruder based on criteria such as the time taken to enter the code, hour at which it was being accessed, and the number of times it was accessed that day.

Non-Invasive Engine Inspection Prototype *(TATA Motors)*

- Developed a prototype for TATA Motors to inspect engines to be refurbished using borescope, Arduino, and Raspberry Pi.
- Implemented image processing and fault detection using deep learning for the prototype to reduce the amount of time required in completely dismantling and examining an engine from a few hours to 10 minutes.
- Attained an accuracy of **85%** for defect detection using UNet.

Follow-me Drone *(AeroMIT, Advanced Drone Research Subsystem)*

- Modelled the development of vision-based control system for drones.
- Incorporated visual identification functionality based on HOG transform and tracking using Farneback Optical flow.
- Programmed the system to run real-time edge operations on computationally limited platform.

PUBLICATIONS

- U. Verma, Arjun Chauhan, M.Pai, R. Pai, **Deep Learning based Semantic Segmentation approach for River Width Measurement in SAR Images, Computers and Geosciences Journal, Elsevier.** Submitted.
- Arjun Chauhan, A. Kumar, S. Srivastava, R. Bhatnagar, **Analysis of Online News Popularity and Bank Marketing Using ARSkNN, Advances in Intelligent Systems and Computing, Springers IC4S, Bangkok**, October 2017, pp.13-22, ISBN No: 978-981-13-0341-8, Volume 759

ACHIEVEMENTS AND AWARDS

- Awarded the second position in National level competition organised by Coursera (2019)
- Finalist for MBRDI's Virtual Drive Challenge Hackathon (2019).
- Won the Makerthon challenge held at IIT Bombay Tech Fest (2018).
- Won National level TATA Solverhunt 2 Challenge (2018).
- Honoured for our proposed solutions to TATA Motors and TATA International at TATA's Annual Review Ceremony (2018).
- Won several medals at various state, national and inter-collegiate swimming competitions as a part of the Rajasthan team and subsequently the MIT Swimming team.
- Won several medals at various state, national and inter-collegiate athletics competitions as a part of the Rajasthan team and thereafter the College/University team.
- Qualified for Nationals in 10m air rifle shooting from Rajasthan. Came 44th in Open State Championship (2017).

ONLINE COURSES AND CERTIFICATIONS

- Machine Learning offered by Stanford University (Coursera)
- Data Science Specialization offered by Johns Hopkins University (Coursera)
- Deep Learning Specialization offered by deeplearning.ai (Coursera)
- Tensorflow in Practice Specialization offered by deeplearning.ai (Coursera)
- Tensorflow: Data and Deployment Specialization offered by deeplearning.ai (Coursera)
- Artificial Intelligence for Robotics (Udacity).

TECHNICAL SKILLS

- **Programming Languages**: C, C++, Python, MATLAB, R
- **Machine Learning Libraries**: Keras, Tensorflow, Scikit-learn
- **Design and Simulation Software**: LATEX, Simulink, LTSpice
- **Hardware**: Arduino, Raspberry Pi, Tinkerboard, STM32

POSITIONS OF RESPONSIBILITY

Technical Head *(IE-E&C Student Chapter)* *2019-2020*

- Conducted workshops for a group of approximately 250 students addressing the topics of Arduino programming and machine learning (kNN, SVM, ANN) with Python during TechTatva (College Tech Fest).
- Organized and oversaw the club's activities during technical and cultural festivals.
- Guided participants with their projects for the annual Winter Project Competition.

Swimming Team Captain *2018-2020*

- Led the MIT Swimming Team to victory in several national level inter-collegiate competitions held throughout the country.
- Won a total of more than 40 medals individually.