

# Mrinaal Dogra

SENIOR ENGINEER · SAMSUNG R&D INSTITUTE BANGALORE-INDIA

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## Education

Year	Degree	Institute	CPI/%
2015-2019	B.Tech Computer Science and Engineering	IIT Kanpur	9.0/10.0
2015	All India Senior School Certificate Exam(CBSE)	KV No.2 Jammu Cantt.	94%
2013	All India Secondary School Exam(CBSE)	KV No.2 Jammu Cantt.	10.0/10.0

## Skills

<b>Programming</b>	Python, JAVA, C/C++, Shell Script(Bash), LaTeX
<b>Libraries</b>	Tensorflow, Scikit-learn, DeepLearning4Java(DL4J), Flask, MPICH C++, OpenCV, CUDA C/C++
<b>Software &amp; Tools</b>	Android Studio, Git, Perforce Helix Core, GDB, ROS
<b>OS and Platforms</b>	Linux, Windows, Raspberry-Pi, Arduino
<b>Languages</b>	English(Fluent), Hindi(Native Speaker)

## Work Experience

### Samsung R&D Institute Bangalore

Bangalore, India

SENIOR ENGINEER, MACHINE LEARNING

Mar 2021 - Present

- Working closely with remote team in HQ(S.Korea) for continuous development and improvement of the current ongoing project.
- Adept in identifying development issues, brainstorming solutions, and constantly improving solutions via testing and feedback.
- Submitted a technical research paper related to the App recommendation project from last year in **IEEE ICSC 2022**
- Has been an inventor of two patents of which the provisional patent specification is filed.

ENGINEER, MACHINE LEARNING

June 2019 - Feb 2021

- Actively contributed in **Robotic Camera Visualization** project. Major contribution involve creating a 3D Point-cloud representation from raw Time-of-Flight (ToF) camera data in android using Android OpenGL library, and implemented 3D Zoom, Pan and Rotation Gesture UI elements.
- Major contributor in **App Recommendation** project where developed NN model needs to be trained in a **Federated Learning** environment. Project involved training NN model in Java using its DL4J library, and development of android User Trial(UT) application supporting on-device model training and inference. UT App was deployed and evaluated by 100+ SRIB internal users who were satisfied with the recommendations.
- Developed projects while following **Scrum** and **Kanban** agile software development processes.
- Ensured development of high-quality code by following **SOLID design principles** and diligently participating in code reviews.
- Participated in industry level training on the latest advancements in agile development and new technologies.

### Samsung R&D Institute Bangalore

Bangalore, India

UNDERGRADUATE ML DEVELOPER INTERNSHIP

May 2018 - July 2018

- Developed a NN-model to predict the current location of a user based on their most recent known location and the time of the day.
- Created a simulated environment for eNodeBs' placement and developed a probability-based classification model to predict which eNodeB the user is connected to at any time of the day based on their most recent known location.
- Proposed strategies to re-compute and update the probabilities on the fly in the final model.

### Hike Private Limited

New Delhi, India

UNDERGRADUATE ML DEVELOPER INTERNSHIP

May 2017 - July 2017

- Implemented Convolutional Neural Network (CNN) models using Tensorflow to classify images into three different categories – memes, quotes, and personal images like selfies, family/group photos, landscape photos, etc.
- Used Transfer Learning approach to train few pre-trained models such as Inception-v3 and MobileNets, and adapted them to the required task.
- Worked with Google ML-Engine API for training the CNN models on the Google Server Machines.
- Developed a Server-Client support using Tensorflow Serving for deploying the model in production.

## Projects

### Humanoid Robotics Project

IIT Kanpur

CORE MEMBER, ROBOTICS CLUB

Oct. 2015 - Apr. 2017

- Implemented various algorithms such as Line Following, Object Detection and Object Tracking using OpenCV C++.
- Implemented the Speech Recognition, Chat-bot and the Integration System modules for the project HURO in the SnT Summer Camp 2016.
- Actively worked with team on Computer Vision problem statements required for participation in the competition HuroCup Fira, a robotic game and robotics benchmark problem for humanoid robots.
- Implemented Histogram Backprojection algorithm using OpenCV for improving object detection in a camera feed.

## Neural Network Based Modelling and Control of Quadrotor

IIT Kanpur

UNDERGRADUATE PROJECT, PROF. INDRANIL SAHA

Jan. 2018 - May. 2018

- Implemented Neural networks to learn a quadrotor model and its dynamics, and used them to synthesize its controller.
- Simulation environment was set up comprising of Mavros, PX4 and Gazebo which was used to fly a virtual quadrotor and to collect data.
- Collected data for multiple trajectories involving straight lines, sinusoidal, and random trajectories, for training the models.

## Real-time Sentiment Analysis of Video Feed

IIT Kanpur

COURSE PROJECT: INTRODUCTION TO MACHINE LEARNING, PROF. PURUSHOTTAM KAR

Aug. 2017 - Nov. 2017

- Analyzed performance of existing standard CNN networks like LeNet and MobileNet to classify user sentiment from real-time video feed.
- Proposed and implemented a smaller version of AlexNet in order to reduce model complexity.

## Detecting Semantically Similar Questions on Quora Dataset

IIT Kanpur

COURSE PROJECT: NATURAL LANGUAGE PROCESSING, PROF. HARISH KARNICK

Jan. 2018 - May. 2018

- Performed literature review on the existing work for detecting semantically equivalent questions from any publicly available corpora.
- Implemented a state-of-the-art work and conducted hyper-parameter tuning for training the model on Quora dataset.
- Implemented another model using Siamese neural network architecture and achieved near state-of-the-art accuracy.
- Proposed and tested few variations of the Siamese network approach while trying to improve the test accuracy.
- Analyzed the effect of including few linguistic constraints in order to improve performance and analyzed the results.

## One-Shot Learning

IIT Kanpur

COURSE PROJECT: DATA MINING, PROF. ARNAB BHATTACHARYA

Aug. 2018 - Nov. 2018

- One-Shot learning tries to solve the object categorization problem while using one, or only a few, samples of each category/class.
- Studied and implemented the state-of-the-art methods of one shot learning, especially Siamese networks and Matching Networks.
- Used the Omniglot and MNIST dataset for analyzing the effectiveness of implemented methods.

## Multi-user P2P Video Conferencing Web Application

IIT Kanpur

COURSE PROJECT: COMPUTER NETWORKS, PROF. DHEERAJ SANGHI

Aug. 2018 - Nov. 2018

- Implemented a video conferencing web application capable of handling multi-stream video feeds of many users.
- Application supported peer-to-peer communication and multiple conference rooms, each room capable to run an independent conference.
- Used webRTC communication technology to enable real-time media communication between peers connected in a conference room.

## Ada to MIPS Compiler implemented in C++

IIT Kanpur

COURSE PROJECT: COMPILER DESIGN, PROF. SUBHAJIT ROY

Jan. 2018 - May. 2018

- Implemented an Ada to MIPS compiler using C++ as the source language of the compiler.
- Implemented language features include Basic Arithmetic operations, Range Operator, Constant Variables, Fixed size Arrays with upto two dimension support, If-Else and If-Else-Else conditionals, Switch cases, Simple for, while, and do-while loops, Procedures(Functions) and Recursions, Packages(Classes) supporting any number of data members as well as objects of other packages, and Package level Methods.
- Basic Integer and Character data types were supported for all implemented features.

## HealthCare DApp

IIT Kanpur

COURSE PROJECT: BLOCKCHAIN TECHNOLOGY AND APPLICATIONS, PROF. SANDEEP SHUKLA

Aug. 2017 - Nov. 2019

- Decentralized Application (DApp) implemented using Ethereum Blockchain platform to keep patients' and doctors' data at a health center.
- Application allows a patient to maintain their medical data and reports securely using blockchain technology.
- Patients were given full control over their data, and only they had the power to grant access of their data to any doctor.
- Application also supported appointment bookings, where a patient can book an appointment with a doctor one-week in advance.

## N-Body Simulation in CUDA

IIT Kanpur

PROJECT UNDER ACA (ASSOCIATION OF COMPUTER ACTIVITIES)

Jan. 2016 - May 2016

- A simulation of dynamical system of a large number of particles, moving under the influence of gravity.
- Used the CUDA API along with C++ for parallel implementation of the simulation on a Nvidia GPU.
- Implemented the visual realization of the simulation using the OpenCV library in C++.

## Relevant Coursework

### ONLINE COURSERA

<b>Robotics</b>	Aerial Robotics(Prof. Vijay Kumar, UPenn), Computational Motion Planning(Prof. CJ Taylor, UPenn)[ongoing]
<b>Machine Learning</b>	Sequence Models(Prof. Andrew Ng), Hyperparameter Tuning, Regularization and Optimization(Prof. Andrew Ng) Machine Learning(Prof. Andrew Ng)

### UNDERGRADUATE

<b>Computer Science</b>	Operating Systems, Computer Networks, Parallel Computing, Data Structure & Algorithm, Advanced Algorithms, Compiler Design, Computer Systems Security, Introduction to Software Engineering, Blockchain Technology
<b>Machine Learning</b>	Introduction to Machine Learning, Natural Language Processing, Data Mining, Computational Cognitive Science
<b>Others</b>	Introduction to Electronics, Introduction to Electrical Engineering, Neurobiology

## Awards and Achievements

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2021	<b>SPOT Award</b> , Samsung R&D Institute Bangalore	Bangalore, India
2020	<b>Clean Code Culture Award</b> , Samsung R&D Institute Bangalore	Bangalore, India
2020	<b>Samsung Citizenship Award</b> , People & Process - Commitment, Samsung R&D Institute Bangalore	Bangalore, India
2018	<b>Academic Excellence Award</b> , 2017-18 Academic Year, Dept. of Computer Science and Engineering	IIT Kanpur

## Positions of Responsibility

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2019	<b>Mentor</b> , Project under Association of Computer Activities (ACA)	IIT Kanpur
2018	<b>Teaching Assistant</b> , Course: Data Structures and Algorithms	IIT Kanpur
2017-18	<b>Event Manager</b> , Robogames Techkriti'18	IIT Kanpur
2016-17	<b>Student Guide</b> , Counselling Service	IIT Kanpur
2016-17	<b>Secretary</b> , Robotics Club	IIT Kanpur
2016	<b>Mentor</b> , Project under Robotics Club Winter Camp 2016	IIT Kanpur