

## EDUCATION

### Machine Learning, Speech and Language Technologies

*Master of Philosophy*, University of Cambridge

2015 – 2016

70.13%

### Mathematics and Computing

*Master of Technology*, Indian Institute of Technology Delhi

2010 – 2015

8.246 / 10.0

## PROFESSIONAL EXPERIENCE

### Research Scientist, IBM Research, *Ireland*

Deep Learning, Generative Models, Unsupervised Learning

Jan 2017 - present

## ACADEMIC EXPERIENCE

### Model Uncertainty for Adversarial Images using Dropout

*M. Phil. Thesis, 2016*

Statistical dispersion in misclassification of adversarial images was studied. Adversarial images were generated for Convolutional Neural Networks trained on CIFAR-10 data set. Inexpensive uncertainty estimates were computed using Dropouts. Experiments hinted at an absence of model-uncertainty in the Dropout-interpretation of Bayesian CNNs.

### Machine Learning for Speech & Language based Systems

*Course Projects, 2016*

Speech Recognition (ASR), Text-to-Speech synthesis (TTS), Machine Translation (MT), and Spoken-Dialogue systems were investigated in-depth. Rigorous theoretical analysis was coupled with experimentation of nuanced aspects like – use of Deep Learning, Confusion Networks, speaker adaptation, and Language Models in ASR, TTS, and MT; belief tracking and policy optimisation in Dialogue Manager; engineering systems for Keyword Spotting using HTK Toolkit.

### Visual SLAM on Android

*M. Tech. Thesis, 2015*

Developed an Android application for simultaneous localisation and mapping of a device using Kalman-Filters and SIFT-corner detectors. Sensory inputs from camera, gravitation sensor and accelerometer were used.

### Multi-document Text Summarisation

*Research Project, 2014*

Combined random-indexing based word-space model with clustering and sentence-selection schemes for multi-document text-summarization. ROUGE scores were evaluated on DUC datasets for a detailed comparative analysis.

## RESEARCH INTERNSHIPS

### Large-Scale Deep Learning Applications

IBM Research, *Ireland*

*Sep 2016 – Jan 2017*

Developed and benchmarked performance for a library built over TensorFlow for easy training and testing of Deep Learning models in a distributed environment.

### Distributed control for SwissFEL

PSI Villigen, *Switzerland*

*May 2015 – Aug 2015*

Developed a data acquisition system using ZeroMQ and protocol buffers. A detailed publication of the system was presented at **ICALEPCS 2015**, Melbourne.

### Braille Tutor on Raspberry Pi

Assistech Lab IITD, *India*

*Jan 2014 – June 2015*

Led software development for a multimodal Braille tutoring device. Speech, video and tactile feedback were integrated. (**India Patent Application**: 1729/DEL/2014)

### Audio playback on Android

Qualcomm, *India*

*May 2013 – July 2013*

Optimised memory-copy operations for reduced power consumption during audio playback. A 50ms reduction in wake-up time of OpenMAX threads was observed.

### Parallelising Graph Primitives on GPUs

IISc Bangalore, *India*

*June 2012 – July 2012*

Implemented parallel scan and segmented scan using OpenCL for AMD Raedon.

## SKILLS

*Programming Languages:*

Python, Java

*Machine Learning Tools:*

TensorFlow, Theano,  
Caffe, MATLAB

*Other APIs (familiar):*

keras, Spark, Protocol  
Buffers, OpenCV, HTK,  
ZeroMQ, CUDA, OpenCL

## OTHER INTERESTS

- Blogs at *90percenthumour*
  - *ML blog*
  - *General blog*
- Worked at Avanti Fellows for science and math mentorship