

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

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 – present

Developed and benchmarked performance for a library built over TensorFlow for easy training and testing of Deep Learning models in a distributed environment. Investigated novel frameworks for weather-related delays in airline network.

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 **ICAELPCS 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):

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

OTHER INTERESTS

- Blogs at 90percenthumour
- Worked at Avanti Fellows for science and math mentorship
- Teaching Assistant for first-year Calculus course at IITD