

Nishant Gurunath

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OBJECTIVE

Seeking internship to develop algorithms for machine learning

EDUCATION

CARNEGIE MELLON UNIVERSITY (CMU)

MASTER OF SCIENCE IN ELECTRICAL AND COMPUTER ENGINEERING

Expected December 2019

Pittsburgh, PA

GPA: 3.57 / 4

INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY (IIT BOMBAY)

BACHELOR OF TECHNOLOGY +

MASTER OF TECHNOLOGY IN

ELECTRICAL ENGINEERING +

MINOR IN COMPUTER SCIENCE

Graduated June 2016

Mumbai, India

GPA: 8.57 / 10

CURRENT RESEARCH

SPEECH SYNTHESIS: NATURAL LANGUAGE PROCESSING

PROF. ALAN BLACK, CMU

COURSEWORK

CMU

Introduction to Machine Learning

Introduction to Deep Learning

Foundations of Computer Systems

Probabilistic Graphical Models

Computer Vision

IIT BOMBAY

Foundations of Machine Learning

Data Structures and Algorithms

Probability and Random Processes

Linear Algebra

Graph Theory

SKILLS

PROGRAMMING

Python • C/C++ • HDL • SQL

PACKAGES

Pytorch • MATLAB • GDB

MACHINE LEARNING

AUDIO BASED MULTIMEDIA EVENT DETECTION AND BAYESIAN LEARNING | CMU

Fall 2018 | Introduction to Deep Learning | Prof. Bhiksha Raj

- Designed ResNet based event classification model on limited YLI-MED training data
- Developed data augmentation method to enhance dataset by temporal perturbation
- Applied Bayesian learning on network parameters to add robustness with regard to unknown data; achieved **4 percent point** improvement over the baseline CNN model

IDENTIFYING DUPLICATE QUESTIONS ON QUORA | CMU

Fall 2018 | Introduction to Machine Learning | Prof. Ziv Bar-Joseph

- Designed siamese BiLSTM and CNN models to detect semantics of the questions
- Modeled a CNN with parallel kernels to capture meaning from different parts of the question; improved on the CNN based state-of-the-art accuracy by **1.5 percent points**
- Obtained a further 2 percent point improvement over CNN with BiLSTM model

LISTEN, ATTEND AND SPELL: ATTENTION MODEL | CMU

Fall 2018 | Introduction to Deep Learning | Prof. Bhiksha Raj

- Created a speech to text generation LAS model using cascaded LSTM networks
- Designed a pyramidal BiLSTM speech encoder to reduce computational complexity
- Modeled an attention based LSTM transducer which generates a distribution over the next character conditioned on **all previous characters**; Obtained an accuracy of 75%

SPEAKER CLASSIFICATION AND VERIFICATION: TRANSFER LEARNING | CMU

Fall 2018 | Introduction to Deep Learning | Prof. Bhiksha Raj

- Created a speech classification model using a CNN with residual blocks
- Trained the network to learn speaker embeddings during the classification task
- Used the learned embeddings to obtain similarity between a given speaker pair
- Obtained an EER ≈ 5 for a test sample consisting 10000 speaker pairs

IMAGE CLASSIFICATION : CIFAR-10 | CMU

Fall 2018 | Introduction to Deep Learning | Prof. Bhiksha Raj

- Performed input data whitening to detect higher order pixel associations
- Created an image classification model on Cifar-10 dataset using Convolutional Neural Networks; Obtained an accuracy of 70% on the test data

ARTIFICIAL NEURAL NETWORK ACCELERATION OVER NETWORK-ON-CHIP (NOC)

IIT BOMBAY | MASTER'S THESIS | [LINK TO THESIS](#)

April 2015 – June 2016 | Prof. Sachin Patkar

- Proposed a design time programmable Network-On-Chip based architecture and made it feasible to fit a complex ANN system on a single FPGA
- Demonstrated that the performance (CPPS) of the proposed architecture is **139%** improvement on the existing commercial (Philips) devices

WORK EXPERIENCE

DIGITAL DESIGN ENGINEER | TEXAS INSTRUMENTS

July 2016 – June 2018 | Bengaluru, India

- Worked on hardware aspects of AI - Sensing, Processing, Control and Security
- Designed 10 IPs and integrated them to create a microcontroller System-On-Chip
- Integrated the first ever ARM core based subsystem for the team

Saurabh Pandey, Venkatseema Das, Arif Mohammed, Nishant Gurunath. "Simulation Based Pre-Silicon Characterization" DVCON, Bangalore, 2014