Nishant Gurunath

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OBJECTIVE

Seeking employment to develop algorithms and software for machine learning

CORPORATE ROLES

TEXAS INSTRUMENTS
Design Engineer, 2016-2018

EDUCATION

CARNEGIE MELLON UNIVERSITY (CMU)
Master of Science in Electrical and Computer Engineering
Expected December 2019
Pittsburgh, PA
GPA: 3.78 / 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

COURSEWORK

CMU
Introduction to Machine Learning
Introduction to Deep Learning
Foundations of Computer Systems
Probabilistic Graphical Models
Computer Vision
How to Write Fast Codes
Machine Learning for Signal Processing

IIT BOMBAY
Data Structures and Algorithms
Probability and Random Processes
Data Analysis and Interpretation
Linear Algebra
Graph Theory

SKILLS

PROGRAMMING
Python • C/C++ • HDL • SQL

PACKAGES
Pytorch • MATLAB • GDB • Falcon

WORK EXPERIENCE

MACHINE LEARNING INTERN | Moody's Analytics | New York, NY
May 2019 – August 2019 | Return Offer as Associate Director: Machine Learning
- Initiated a **new product** that aimed to extract structured information from text data
- Implemented a workflow around AllenNLP OIE and SRL models to obtain relationship knowledge graph among named entities - people, organizations and locations
- Performed Text Normalization, Entity Disambiguation, Named Entity Recognition, Coreference Resolution and Neo4j graph database queries as part of the workflow
- Created APIs for two product lines and customized Framenet based argument parsing

RESEARCH ASSISTANT - NLP | Separabl: Disentanglement in Speech | CMU
January 2019 - Present | Prof. Alan Black | LTI
Submitted in AAAI 2020 | Paper | Samples | Currently Working on its Product
- **Proved** that multinode VAE can be used to separate speech and music in audio
- Experimentally determined the number of latent nodes required for source separation; showed that the same can be determined from input data distribution
- Established improvement in Speech Synthesis performance using separated speech

ACADEMIC PROJECTS

HIERARCHICAL REINFORCEMENT LEARNING | CMU
Spring 2019 | Probabilistic Graphical Models | Prof. Eric Xing
- Proposed to learn policies simultaneously for two agents, manager and worker, working at different temporal scales to target environments with sparse rewards
- Demonstrated that method is applicable with all reinforcement learning algorithms
- Achieved a **60%** improvement in reward for the Stochastic MDP environment
- **Conquered** sparse reward robotic environments - ReacherV2 and FetchReachV2 where standard/ flat reinforcement learning methods fail completely

IDENTIFYING DUPLICATE QUESTIONS ON QUORA | CMU
Fall 2018 | Introduction to Machine Learning | Prof. Ziv Bar-Joseph
- Designed Siamese models over Glove embedding 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

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 training data (YLI-MED)
- 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

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 $\approx$ 5 for a test sample consisting 10000 speaker pairs