Varshith Sreeramdass

Computer Science Undergraduate

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Education

Indian Institute of Technology, Bombay *8.72*

B.Tech. in Computer Science and Engineering with Honours *2015 - 2019*

Telangana State Board of Intermediate Education *9.78*

Intermediate/+2 in Maths, Physics and Chemistry *2013 - 2015*

Board of Secondary Education, AP *9.50*

Matriculation *2013*

Key Research

Domain Adaptation of Cloud NLP Services through word substitutions

IIT Bombay

Prof. Sunita Sarawagi | Undergraduate Thesis *Jan '19 - April '19*

- Built models that perform **contextual word substitutions** in sentences to improve performance of **cloud NLP services** like sentiment classification, NER tagging
- Designed a **reinforcement learning algorithm** to train the model using sentence and token level rewards
- Studied various **exploration strategies** in word substitution space to find relevant words efficiently

Improving Scene Graph Generation with knowledge from corpora

IIT Bombay & IBM Bangalore

Prof. S. Chakrabarti, Amrita Saha | Research Project *Jan '19 - April '19*

- Explored various sources of **side information** that could improve scene graph completion task in a data-scarce scenario
- Built a pipeline to parse text corpus into **prior distributions** in the relation label space
- Implemented **LK distillation**, a method of prior-incorporation and studied its performance

Out-of-distribution detection with Neural Networks

IIT Bombay

Prof. Sunita Sarawagi | Undergraduate Thesis *July '18 - Nov '18*

- Analyzed **calibration performance** of established models on **out of distribution** samples
- Surveyed out-of-distribution detection methods involving deep image classification models
- Methods include multi-labe modeling of classification, variational information bottlenecks and their extensions

Sign Language Synthesis with Adversarial Styling

Honda Research Institute Japan

Brock, Heike | Internship *May '18 - July '18*

- Developed Sequence to Sequence models to **synthesize JSL gestures** from annotated Japanese sentences
- Modelled the generation of gestures with **adversarially learnt style features** to incorporate **natural human-like variability** in the synthesized gestures
- Explored various representations of orientations for efficiently learning them in a data scarce scenario

Key Projects

Predictive Music Synthesis

IIT Bombay

Prof. Ganesh Ramakrishnan | Course Project *Feb. '17 - Apr. '17*

- Developed and trained a **generative model** to learn **patterns in musical notes** and **produce music** in an iterative manner using a sliding window approach
- The generative model involved use of **LSTM cells and dense layers** to capture **long term patterns** in the sequences of notes in piano roll and MFCC representations
- Performed **tempographic, spectrographic and frequency analysis** on the generated music to study the effectiveness of the model in generating rhythm

Deep Kalman Filters

IIT Bombay

Prof. Sunita Sarawagi | Course Project *March '18 - May '18*

- Implemented learnable **Kalman Filters** using **deep neural networks** and VAE inspired methods
- Applied models to **Rossman Store Sales** dataset to study and perform long term sales forecasting

Hand Gesture Recognition

IIT Bombay

Institute Technical Summer Project | Self Project *June '16*

- Designed, built **gesture recognition glove** using accelerometer, gyroscope, flex sensors & Bluetooth module
- Interfaced sensors to **microprocessors programmed in C** relaying the data to a mobile device
- Developed algorithms to process the data stream on an **Android application** using **Dynamic Time Warping** algorithms to recognize predefined **static and dynamic gestures**
- Investigated further development of the recognition software using **classification models** built on **weka**

Positions of Responsibility

Teaching Assistant

Software Systems Lab, Autumn 2018 *July '18 - Nov '18*

- Designing assignments and assessments, organizing tutorials and help sessions for a batch for 130 stduents

Department Academic Mentor

CSE Department, IIT Bombay *May '18 - Present*

- Mentoring 7 sophomore students and helping them cope with academic problems

Achievements

2015 **AP Grade**, Exceptional Performance in Engineering Graphics
2015 **AIR 204**, Joint Entrance Examination Advanced
2015 **AIR 254**, Joint Entrance Examination Mains
2014 **AIR 710**, Kishore Vaigyanik Protsahan Yojana Fellowship
2014 **Top 1%**, NSE Physics, Andhra Pradesh, IAPT

Other Projects

Distributed Database System over PostgreSQL

IIT Bombay

Prof. Sudarshan S | Course Project *July '17 - Nov '17*

- Built a wrapper over **multiple PostgreSQL servers** to facilitate use as a single database system
- Developed algorithms for **parallelizing** select, insert, aggregate and delete operations over the nodes

Theory of Transducers

IIT Bombay

Prof. Krishna S | Summer RnD Project *May '17 - July '17*

- Pursued constructive proof for the **closure property** of two way DFTs **under composition**
- Studied and analyzed the research papers on **equivalence of expressibility** of **MSO Transductions** and **two way DFTs**, and the proof techniques involved
- Worked on the proposal of a model of **Streaming String Transducers** (SSTs), equivalent to ω **SSTs**, modelling relations of infinite strings, but under **Büchi acceptance** conditions

Animation and Rendering framework

IIT Bombay

Prof. Parag Chaudhuri | Course Project *Sept. '17 - Nov. '17*

- Built a framework for **modelling and rendering** primitive and composite objects, texturing, lighting (using OpenGL)
- Developed an **animation** framework, capable of recording key frames and interpolations along bezier curves

Trading Strategies Research Study

Indian School of Business

Centre for Analytical Finance | Internship *December '16*

- Studied **trading strategies** designed for the US Equity Market and their applicability in the Indian context
- Trading strategies involved financial statement analysis on historical data involving **F-Scores** and **Accruals**
- Back-tested strategies using data analytical package, **STATA**

Choreophraphy using RNNs *IIT Bombay*

Yahoo! Hackathon | Self Project *March '17*

- Developed a **Sequence to Sequence** model trained to **map musical notes to dance step sequences**
- The model used **RNNs** to learnt patterns in the note sequences in their **MFCC** representation

Android and Web Applications for Feedback Collection *IIT Bombay*

Prof. Sharat Chandran | Course Project *November '16*

- Implemented an Android Application with a **calendar-setup** for submission-deadlines, extra classes, announcements, and reminders
- Functionality for **feedback provision** regarding examinations, assignments
- Web portal for Class Representatives and Professors for **course management** developed using **Django** Web Framework
- Implemented **feedback management** and analytical tools to summarize data

Interests

ML, Reinforcement Learning and Visualizing Learning

Neuromorphic Computing

Signal Processing

Logic and Complexity Theory

Skills

Languages

C++/C, Java, Python, JS

MATLAB, STATA, R

Softwares and Packages

Tensorflow, Keras, CUDA (basic)

Git, Android Studio, Django, SQL

LaTeX, Office Suite

OpenGL

Courses

AI/ML

Artificial Intelligence

Foundations of Intelligent and Learning Agents

Advanced Machine Learning

Foundations of Machine Learning

Algorithms, Logic, Systems

Data Structures and Design of Algorithms

Formal Languages and Automata Theory

Digital Logic Design

Network Security and Cryptography

Databases and Information Systems

Computer Architecture

Operating Systems

Compilers

Others

Neuromorphic Engineering

Computer Graphics

Digital Image Processing

Extracurricular Activity

Participated in the Asian Regional Space Settlement Design Competition and stood Runners' Up *2013*

Participated in the Performance Arts Festival, IIT Bombay as a part of the winning team *2015*

Completed a year long course in Dramatics conducted by National Sports Organisation *2015*