Swarnashree Mysore Sathyendra

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EDUCATION

Carnegie Mellon University - School of Computer Science — Pittsburgh, PA

MS in Intelligent Information Systems, Language Technologies Institute | **GPA 4.00/4.00** — *Dec. 2022*

Graduate Teaching Assistant for flagship course - Natural Language Processing (11611)

Courses: Deep Learning (11785), Advanced Algorithms for NLP (Neural Networks for NLP), Machine Learning, ML for Text and Graph Mining, Multimodal ML, Visual Recognition and Learning, Computational Ethics for NLP

PES Institute of Technology — Bangalore, India

Bachelor of Engineering in Information Science | **GPA 9.56/10.0 (Department Rank 1)** — *May 2018*

Selected Courses: Machine Learning, Introduction to NLP, Data Analytics, Computer Vision, Information Retrieval, Linear Algebra

PUBLICATIONS

Multi-Dimensional Evaluation of Text Summarization with In-Context Learning (* – equal contribution)

Sameer Jain, Vaishakh Keshava, **Swarnashree Mysore Sathyendra**, Patrick Fernandes, Pengfei Liu, Graham Neubig and Chunting Zhou

61st Annual Meeting of the Association for Computational Linguistics (ACL Findings 2023) **[paper]**

Real-Time Headgear Detection in Videos using Deep Learning based Feature Extraction with a Supervised Classifier

Swarnashree Mysore Sathyendra*, Rajdeep P*, Ranjana S*, S. Natarajan

24th International Conference on Advanced Computing and Communications (ADCOM 2018), IIIT Bangalore, 2019 **[paper]**

Real-time Text-Search on Encrypted Data

Presented the paper in association with Goldman Sachs at **Grace Hopper Conference(GHC) India 2019**

PROFESSIONAL EXPERIENCE

Amazon — Cambridge, Massachusetts

Applied Scientist Intern, Alexa AI - Natural Understanding — *May. 2022 – Aug 2022*

- Proposed and implemented statistical significance testing with regressions and unsupervised NMF-based clustering mechanisms for investigating **fairness in entity resolution(ER)** models. Identified and quantified potential bias in current ER systems through fairness metrics
- Conceptualized and implemented an audit toolbox with **attribute inference attack models** for bias quantification; paper submitted for internal Amazon Machine Learning Conference (AMLC 2022)

Goldman Sachs — Bangalore, India

Software Development Engineer II (Fast-track promotion from SDE I) — *May 2018 – June 2021*

- Designed and built an **ingestion pipeline** and **optimized query solution** leveraging **HDFS, Presto, Spark** and **yarn**. Reduced the data consumption time for downstream applications from **48hours to less than 1 hour**
- Designed and built a **smart FAQ chatbot** with **POS-based** semantic parser, **Singular Value Decomposition** for **dimensionality reduction** and custom word jumbling techniques for compliance officers to find relevant answers/policies; achieved feature vector size reduction by **96%**
- Built a **process chain management system** with features of **intelligent logging, process chain rerunnability** and **version controlling** of intermediate data using **Directed Graphs (DAGs)**; **significantly reduced process slowness** encountered during the annual analysis on the firm's capital standing (CCAR process) **reviewed by the US Federal Reserve**
- Built a **search engine independent plugin** for **real-time text search** on **encrypted data** using AES Encryption, **n-grams**

SELECT PROJECTS

Keyword Tagging in Low-Resource Languages — CMU | Pittsburgh, PA

Advisor: Prof. Alan W Black

- Built a BiLSTM-based model for keyword tagging in **low-resource language** speech using speech **phones** instead of transcripts with a universal phone recognizer. Generated phone embeddings for the Tamil MSRCodeswitch challenge dataset with transcripts tagged on presence/absence of keyword

Attention-based Automatic Speech Recognition(ASR) — CMU | Pittsburgh, PA

- Built the Listen, Attend and Spell(LAS) seq2seq model with pyramidal BiLSTM encoder and LSTM cell decoder with teacher forcing ASR model and achieved levenshtein distance of **13** on LibriSpeech test data

Debiasing of contextualized BERT Embeddings — CMU | Pittsburgh, PA

- Extended previous work of gender debiasing contextualized BERT-based sentence embeddings with **soft and hard debiasing** mechanisms. Evaluated it on 3 downstream datasets - CoLA, SST-2 and QNLI and compared the mechanisms for information retention and biasing abilities

Face Classification and Verification — CMU | Pittsburgh, PA

- Implemented **ConvNext** CNN face classification model that achieved **88%** accuracy on unseen data. Also implemented **triplet loss** for face verification with an average AUC score of **0.96** on unseen data

Generative Modelling with GANs and Auto Encoders — CMU | Pittsburgh, PA

- Implemented vanilla GAN, LSGAN and WGAN-GP for realistic bird samples generation using CUB 2011 dataset and achieved a **FID** score of **49** on downsampled 32x32 samples. Trained Auto Encoder(AE), Variational AE(VAE) and β-VAE on CIFAR-10 dataset

Real-time Person Detection in Videos based on Natural Language Description — PESIT | Bangalore, India

Advisor: Prof. S Natarajan, Prof. Antony L Piriyakumar Douglas

- Built an end-to-end **multimodal** system to detect persons in surveillance videos in real-time based on a natural language description of their visual characteristics. Involved dataset collection and annotation, **bag-of-words model, R-CNN, YOLO v2 and AlexNet**. Published at **ADCOM 2018**

TECHNICAL SKILLS

Languages: Python, Java, C, R, Matlab
Technologies/Frameworks: TensorFlow, PyTorch, Keras, NLTK, Numpy, scikit-learn, OpenCV, Hadoop, Presto, Spark

OTHER PROJECTS

- **Extensible Evaluation Frameworks for Text Generation**(Ongoing) Exploring **in-context learning and prompt tuning** for large pre-trained Language Models like **GPT-3** for extending evaluations of text generated on new dimensions such as coherence and factuality. Advised by Prof. Graham Neubig
- **Multiparty Conversational Emotion Recognition**: Implemented an RNN-based approach to use **prior acoustic and emotion context** to predict future emotional state with performance improvements of **3%** in weighted-F1 score over non-contexualized models
- **Domain Adaptation in the Wild**: Implemented a weighted multi-layer perceptron model for **joint domain-modelling** and assessing model robustness when gold labels are unavailable, relying only on **pseudo domain labels** generated from clustering approached for VisDA-2019 challenge dataset