

# 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

### Alexandria Investment Research and Technology

Los Angeles, California

*NLP Research Engineer*

Feb. 2023 – Present

- Fine-tuned **FinBERT** model with parameter efficient strategies like **LoRA** for sentiment detection from earnings call transcripts. Improved over **3% accuracy** of current production model.
- Proposed and implemented a topic tagging model with fusion of fine-tuned sentence transformer based **FinBERT semantic embeddings** and custom structural-attribute embeddings from a custom **structural-attribute autoencoder**

### 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  $\beta$ -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 Piriya Kumar 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

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**Languages:** Python, Java, C, R, Matlab

**Technologies/Frameworks:** TensorFlow, PyTorch, Keras, NLTK, Numpy, scikit-learn, OpenCV, Hadoop, Presto, Spark

## OTHER PROJECTS

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- **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-contextualized 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