

# Aditya Srikanth Veerubhotla

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Language Technologies Institute, Carnegie Mellon University

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## EDUCATION

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### Carnegie Mellon University

Pittsburgh, PA

MS, Intelligent Information Systems - Advanced Study. Advisor: [Prof. Jamie Callan](#)

*Aug'21 - May'23*

**Courses:** Advanced NLP, Advanced Multimodal ML, Question Answering, Computational Ethics, Deep Learning

**GPA:** 4.07 / 4.0

### Birla Institute of Technology and Science (BITS) Pilani

Hyderabad, India

Bachelor of Engineering in Computer Science. Thesis Advisor: [Prof. Aruna Malapati](#)

*May'16 - Aug'20*

**Courses:** Machine Learning, Information Retrieval, Artificial Intelligence, Data Mining

**GPA:** 8.79 / 10.0

## PUBLICATIONS

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- [1] **A S Veerubhotla**, L Poddar, J Yin, G Szarvas, S Eswaran, **Few Shot Rationale Generation using Self-Training with Dual Teachers**, To appear in Findings of ACL'23 [\[pdf\]](#)
- [2] **A S Veerubhotla\***, S Agarwal\*, S Bansal\*, S Tripathi\*, S Gururaja\*, R Dutt, T Mitamura, E Nyberg, **R3 : Refined Retriever-Reader pipeline for Multidoc2dial**, DialDoc Workshop, ACL'22 [\[pdf\]](#)
- [3] A Kumar, **A S Veerubhotla**, V T Narapareddy, V Aruru, L B M Neti, A Malapati, **Aspect term extraction for opinion mining using a Hierarchical Self-Attention Network**, Neurocomputing, 2021 [\[pdf\]](#)
- [4] R Mitra, R Jain, **A S Veerubhotla**, M Gupta, **Zero-shot Multi-lingual Interrogative Question Generation for "People Also Ask" at Bing**, KDD'21 [\[pdf\]](#)
- [5] A Kumar, V T Narapareddy, **V A Srikanth**, A Malapati, L B M Neti, **Sarcasm Detection Using Multi-Head Attention Based Bidirectional LSTM**, IEEE Access 2020 [\[pdf\]](#)
- [6] A Kumar, V T Narapareddy, **A S Veerubhotla**, A Malapati, L B M Neti, **Aspect-Based Sentiment Classification Using Interactive Gated Convolutional Network**, IEEE Access 2020 [\[pdf\]](#)
- [7] A Kumar, V T Narapareddy, P Gupta, **V A Srikanth**, A Malapati, L B M Neti, **Adversarial and Auxiliary Features-Aware BERT for Sarcasm Detection**, CoDS-COMAD 2021 [\[pdf\]](#)
- [8] **V A Srikanth\***, S Agarwal\*, S Bansal\*, **PEFTDebias : Capturing debiasing information using PEFTs**, Under review at EMNLP'23

## SKILLS AND INTERESTS

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**Skills :** Natural Language Processing, Prompt Engineering, Deep Learning, PyTorch, Python, Huggingface, FairSeq, ONNX

**Interests :** Large Language Models (LLMs), Question Answering, Dialogue Systems, Multimodal ML, Parameter Efficient Learning, Multilingual NLP, Code Generation, Information Retrieval

## WORK EXPERIENCE

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### Carnegie Mellon University

Pittsburgh, PA

Graduate Research Assistant

*Aug'21 - Dec'22*

- Worked on Cross Lingual Open Domain QA. Developed a novel approach that enables the sharing of information between the reader and retriever through a two-way knowledge distillation process
- Worked on sparse lexical expansion to mitigate vocabulary mismatch problem between queries and documents in a hybrid Information Retrieval system
- Worked on unsupervised domain adaptation of Dense Information Retrieval models using synthetic query generation and adversarial hard negative mining using perturbations

### Amazon Science

Seattle, WA

Applied Scientist Intern

*May'22 - Aug'22*

- Researched on building T5 based Self-Rationalization models in a few-shot (~100 examples/label) settings
- Proposed a novel approach that uses pseudo-labels from two teacher models trained using Self-Training (Semi-Supervised Learning) in a cascading fashion for training the final joint student model

### Microsoft

Hyderabad, India

Applied Scientist - Microsoft Bing

*Jun'20 - Aug'21*

- Trained and shipped multilingual Question Generation and Grammatical Error Detection models supporting the top 100 languages on Bing
- Improved upon document Relevance Classification and Ranking models and increased NDCG@10 by 2.7 points
- Shipped models for doing multilingual Grammatical Error Detection for text cleaning with an AUC of 0.7
- Worked on a proof-of-concept project which became the topic highlights on People Also Ask
- Achieved 6-12x model size reduction of Generative and Discriminative models using Distillation, Quantization and performing inference optimization using ONNX
- Worked on extensions to Enterprise Search

### Microsoft

Hyderabad, India

Undergraduate Thesis - Microsoft Bing

*Jan'20 - Jun'20*

- Researched on Multilingual Neural Question Generation and developed systems to enable QA generation in over 100 languages for "People Also Ask" in Bing [\[pdf\]](#)

- Explored using Reinforcement Learning (Self-Critical Sequence Training), Distillation and Parameter Freezing for improving performance of Question Generation

## Birla Institute of Technology and Science, Pilani

Hyderabad, India

Undergraduate Researcher

Jan'19 - Dec'19

- Developed a resource efficient model for Aspect Term Extraction that outperformed previous BERT-based approaches
- Improved upon previous approaches to develop the best Convolutional Neural Network (CNN) model for Aspect Based Sentiment Analysis
- Created a model (MHA-BiLSTM) that outperformed other baselines in Computational Sarcasm Detection

## Microsoft

Hyderabad, India

Software Engineer (Machine Learning) Intern

Jan'20 - Jun'20

- Designed, implemented and tested Deep Learning algorithms for Text Summarization, Co-reference Resolution, and Automatic Question Generation. The models were successfully integrated with a web service hosted on Azure
- Coordinated with a team of four interns to achieve all set objectives and won the best team award

## L.V. Prasad Eye Institute

Hyderabad, India

LVP-MITRa Summer Intern

May'18 - Jul'18

- Part of the LVPEI-MIT Media Labs collaboration program
- Developed an automated system for patient information collection and integrated it with LVPEI medical record system
- Employed Android for front-end development and implemented a Django web service on the back-end, leveraging the Google Speech Transcription API to enhance user experience for patients.
- Built a bot ecosystem for allowing patient and hospital staff queries to be answered through a chat-bot
- Using Android for displaying the user-interface and a Django web service employing Elasticsearch for retrieving relevant answers

## TEACHING EXPERIENCE

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- Teaching Assistant for [Multimodal Machine Learning](#) (Spring'23) taught by [Prof. Yonatan Bisk](#) and [Prof. Daniel Fried](#). Sole mentor to the course projects of 4 teams. Graded projects, provided feedback and guidance to the teams.
- Teaching Assistant for [Advanced NLP](#) (Fall'22) taught by [Prof. Graham Neubig](#) and [Prof. Robert Frederking](#). Taught NLP bootcamp, designed and graded assignments for the course. Moreover, I was the sole mentor to the course projects of 6 teams. Graded projects, provided feedback and guidance to the teams.

## RESEARCH PROJECTS

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- **Open Domain Jupyter Notebook Code Completion Dataset** : Proposed and working on building a dataset for Jupyter Notebook code completion using reformulated markdowns as queries and a heterogeneous corpus from GitHub and StackOverflow. Advised by [Prof. Eric Nyberg](#), [Prof. Teruko Mitamura](#) and [Prof. Daniel Fried](#). [\[pdf\]](#)
- **Cross Lingual Open Domain QA** : Presented a novel approach that enables the sharing of information between the reader and retriever through a two-way knowledge distillation process. Also explored methods for improving the individual reader and retriever components using self-training and cross-lingual adaptation. Working on publishing our results. Advised by [Prof. Graham Neubig](#). [\[pdf\]](#)
- **Multimodal Multihop Question Answering** : Proposed a three-stage pipeline for WebQA using a corpus-level text retriever, a novel multimodal, multihop reranker for the fine-grained retrieval of information sources and a reader model for answer generation. Advised by [Prof. Yonatan Bisk](#). [\[pdf\]](#)
- **PEFTDB : Parameter Efficient Debiasing of Language models across multiple bias axes** : Developed PEFTDB, an novel method for debiasing language models with minimal parameter usage. Evaluated PEFTDB on four datasets and two bias axes and emphasized the task-agnostic nature of these parameters, enabling their application in mitigating biases across diverse domains. Advised by [Prof. Emma Strubell](#) and [Prof. Maarten Sap](#). [\[pdf\]](#)
- **Domain Adaptation for Open-Domain Conversation Question Answering** : Proposed and building a benchmark for organizing previously proposed datasets and approaches. Advised by [Prof. Eric Nyberg](#)
- **Expansion-Aware Contextualized Inverted List for First-Stage Retrieval** : Presented an extension to the COIL architecture by incorporating automatic term expansion to mitigate the vocabulary mismatch problem present of lexical retrievers. Advised by [Prof. Jamie Callan](#). [\[pdf\]](#)
- **Capturing Multimodal Connections with Negative Construction and Self-training** : Conducted in-depth analysis and improvement of two key multimodal connections: fine-grained alignment between visual and textual objects, and emotional/cardinal connections between visual objects. Advised by [Prof. Louis-Philippe Morency](#). [\[pdf\]](#)

## HONORS AND AWARDS

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- 1st on UNSEEN track for MultiDoc2Dial, DialDoc Workshop in ACL, 2022. Awarded a \$1000 prize
- Awarded "Best Research Talk" at Microsoft internal ML and Data Science conference, 2020, for undergraduate thesis work
- 10/10 GPA in Senior Year, 2019-2020
- Voted "Best Team" for final project demo among 14 teams across Microsoft Garage India, 2019