Aditya Srikanth Veerubhotla

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Language Technologies Institute, Carnegie Mellon University +1 (412) 214-2124

Education

Carnegie Mellon University Pittsburgh, USA
MS, Intelligent Information Systems - Advanced Study. Advisor: Prof. Jamie Callan *Aug'21 - May'23*
Courses: Advanced NLP, Advanced Multimodal ML, Question Answering, Computational Ethics, Intermediate 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

[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

[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, **AAspect-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]

Skills And Interests

Skills : Natural Language Processing, Prompt Engineering, Deep Learning, PyTorch, Python, Huggingface Transformers, ONNX
Interests : Large Language Models (LLMs), Question Answering, Dialogue Systems, Multimodal ML, Parameter Efficient Learning, Multilingual NLP, Code Generation, Information Retrieval

Work Experience

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 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 100 languages
- 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 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 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 and 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 *Jan'20 - Jun'20*

- 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
- Using Android for front-end and a Django web service at the back end. Added Google Speech Transcription API to enable ease of use for the 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

- 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) at CMU. 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

- **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

- 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
- Voted "Best Team" for final project demo among 14 teams across Microsoft Garage India, 2019
- Finalist Engineering The Eye Hackathon, 2018