Tejas Srinivasan

Curriculum Vitae

EXPERIENCE AND EDUCATION

2020-	A.I. FOUNDATION NLP Research Scientist	
2018-20	CARNEGIE MELLON UNIVERSITY Master of Language Technologies (M.L.T.)	GPA: 3.87/4.0
2014-18	INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY Bachelor of Technology in Mechanical Engineering Minor in Computer Science and Engineering	CPI: 9.15/10

PUBLICATIONS

2020 **Fine-Grained Grounding for Multimodal Speech Recognition**
Tejas Srinivasan, Ramon Sanabria, Florian Metze, Desmond Elliott
Findings of Emperical Methods in Natural Language Processing (EMNLP)   Link

2020 **Multimodal Speech Recognition with Unstructured Audio Masking**
Tejas Srinivasan, Ramon Sanabria, Florian Metze, Desmond Elliott
EMNLP Workshop on Natural Language Processing Beyond Text (NLPBT)   Link

2020 **Reasoning Over History: Context-Aware Visual Dialog**
Muhammad Shah, Shikib Mehri, Tejas Srinivasan
EMNLP Workshop on Natural Language Processing Beyond Text (NLPBT)

2020 **Looking Enhances Listening: Recovering Missing Speech Using Images**
Tejas Srinivasan, Ramon Sanabria, Florian Metze
International Conference on Acoustics, Speech and Signal Processing (ICASSP)   Link

2019 **Multitask Learning For Different Subword Segmentations In Neural Machine Translation**
Tejas Srinivasan, Ramon Sanabria, Florian Metze
International Workshop on Spoken Language Translation (IWSLT)   Link

2019 **Structured Fusion Networks for Dialog**
Shikib Mehri*, Tejas Srinivasan*, Maxine Eskenazi
Special Interest Group on Discourse and Dialog (SIGDIAL)   Link
Best Paper Award

2019 **Analyzing Utility of Visual Context in Multimodal Speech Recognition Under Noisy Conditions**
Tejas Srinivasan, Ramon Sanabria, Florian Metze
ICML Workshop on The How2 Challenge: New Tasks for Vision and Language   Link

* - Equal contribution

Research Projects

June 2020 - Present **Measuring Biases in Multimodal Language Models**
Advisor: Prof. Yonatan Bisk
- Developed a framework to measure relational knowledge in visual-linguistic pre-trained models like VL-BERT
- Defined different sources of relational knowledge in multimodal input spaces, and formulated methods to isolate and measure each one individually
- Utilized this framework to measure gender bias for entities in different input sources

Aug. 2019 - Present **Multimodal Co-Learning for Robustness to Missing Modalities**
Advisor: Prof. Louis-Phillipe Morency   *Independent Study*
- Investigated co-learning methods to train models on multimodal data but infer on unimodal data
- Utilized co-learning to regenerate missing modalities during inference time, experimenting with a multitask generative loss term

Apr. 2019 - June 2020 **Multimodal Speech Recognition Under Noisy Conditions**
Advisor: Prof. Florian Metze, Prof. Desmond Elliott
- Analyzed the robustness of multimodal Automatic Speech Recognition (ASR) models to noise in the input speech signal
- Injected silence/white noise into the audio signals to mask a predetermined set of words, and observed if the visual modality can be leveraged to recover them
- Experimented with various fusion methods, and utilized fine-grained visual features to ground missing speech in object proposals.

Aug. 2019 - Dec. 2019 **Unsupervised and Distantly Supervised Frame Discovery**
Advisor: Prof. Yulia Tsvetkov   *Independent Study*
- Incomplete class knowledge in a dataset can lead to semantic drift of known classes
- Graph Clique Discovery (GCD) algorithm uses distant/zero supervision to extract new classes from data points that do not belong to any known class
- GCD outperforms topic models in the discovery of held-out frames from the Media Frames Corpus

Jan. 2019 - Jan. 2020 **Time-Series Networks for Credit Card Default Prediction**
Advisor: Prof. Florian Metze   *Funded by PNC Bank*
- Designed a variety of neural models (including recurrent and convolutional architectures, and their variants) to handle time-series data for predicting credit card defaults
- Explored several existing interpretability techniques to explain default predictions, such as SHAP and Learning to Explain
- Developed interpretability methods to resolve contradictions between global and local explanations

Feb.2019 - May 2019 **Structured Fusion Networks for Dialog**
Collaborator: Shikib Mehri   *11-747: Course Project*
- Explored several methods of incorporating structure of traditional dialog systems into end-to-end neural dialog models
- Introduced Structured Fusion Networks (SFNs), which incorporate pre-trained neural dialog modules that perform specific tasks in the traditional dialog pipeline, into a larger neural dialog model trained end-to-end

| Oct.2018 - | **Multitask Learning for Different Subword Segmentations in Machine Translation** |
| Dec.2018 | *Advisor: Prof. Florian Metze; Collaborator: Ramon Sanabria* |

- Proposed Block Multitask Learning (BMTL), a novel NMT architecture that predicts multiple targets of different granularities simultaneously
- Achieved improvements of upto 1.7 BLEU points over single-task baselines on three language pairs from IWSLT15

| Jul. 2017 - | **End-to-End Speech-to-Text Machine Translation** |
| Dec. 2017 | *Advisor: Prof. Preethi Jyothi* — *IIT Bombay* |

- Developed a Recurrent Neural Network (RNN) encoder-decoder model to translate speech in English to text in German at the sentence level
- Implemented modifications to the standard Seq2Seq architecture, such as pyramidal encoder (for long speech signal inputs) and beam search decoding

PROFESSIONAL SERVICE

| CONFERENCE REVIEWER | EACL 2021, EMNLP 2020, Interspeech 2020, ACL 2020 |
| WORKSHOP REVIEWER | NLP Beyond Text 2020, ACL Student Research Workshop 2020, ACL Challenge-HML 2020 |

COURSES UNDERTAKEN

LANGUAGE TECHNOLOGIES	Algorithms for NLP (11-711), Computational Semantics for NLP (11-727), Neural Networks for NLP (11-747), Multimodal Machine Learning (11-777), Computational Ethics for NLP (11-830)
MACHINE LEARNING	Introduction to Machine Learning (10-701), Topics in Deep Learning (10-707), Probabilistic Graphical Models (10-708)
RELEVANT UNDERGRADUATE	Calculus, Linear Algebra, Differential Equations, Data Structures and Algorithms, Foundations of Machine Learning, Advanced Machine Learning, Introduction to Study of Languages

TECHNICAL SKILLS

| PROGRAMMING | Python, C, C++, MATLAB |
| TOOLS AND PACKAGES | pyTorch, Keras, TensorFlow, NumPy, SciPy, Pandas, scikit-learn, git, LaTeX |

ACADEMIC ACHIEVEMENTS

- Secured an All India Rank 634 in IIT Joint Entrance Examination (JEE) Advanced 2014, among 0.15 million students
- Attained a 99.94 percentile in JEE Main 2014, among 1.4 million students
- Cleared the Zonal Informatics Olympiad in 2011, 2012 and 2013, placing in the top 250 out of more than 5000 participating students each year