Tejas Srinivasan — Curriculum Vitae

Education

2018- **Carnegie Mellon University** — GPA: 3.87/4.0
Master of Language Technologies (M.L.T.)

2014-18 **Indian Institute of Technology, Bombay** — CPI: 9.15/10
Bachelor of Technology in Mechanical Engineering
Minor in Computer Science and Engineering

Publications

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

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

Apr. 2019 - Present **Multimodal Speech Recognition Under Noisy Conditions**
Advisor: Prof. Florian Metze; Collaborator: Ramon Sanabria

- 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
- Obtained upto 35% relative improvement in masked word recovery by using multimodal ASR, indicating that the semantics of the visual context is useful

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

Jan. 2019 - Present **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
- Currently developing interpretability models which can 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
- SFNs exhibit strong performance on the MultiWOZ dataset, heavily outperforming the baseline on the task-specific metrics

Oct.2018 - Dec.2018 **Multitask Learning for Different Subword Segmentations in Machine Translation**
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 - Dec. 2017 **End-to-End Speech-to-Text Machine Translation**
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

May 2017 - Jul.2017 **Markov Chain Modeling for Solar Energy Generation** *Research Internship*
Advisor: Prof. Matthew Peet *Arizona State University*

- Modeled solar generation for different weather types (sunny, mostly sunny, partly cloudy, cloudy) using Markov Chains
- Developed a deviation-based solar generation model, where different weather patterns are keyed by the extent of their deviation from the clear sky generation
- Used Machine Learning techniques, such as multi-class SVM classifiers, to learn a given day's weather type from its weather forecast

Jan. 2017 - Apr. 2017 **Defect Detection in Product Reviews**
Advisor: Prof. Pushpak Bhattacharyya *IIT Bombay*

- Implemented rule-based methods to detect instances of customers mentioning product defects in online reviews
- Developed a defect ontology - a hierarchical mapping of a product's components and features to their defects
- Utilized Google's pre-trained word2vec word embeddings to capture similarity between words; used to detect defect words which were not captured in the ontology

Courses Undertaken

Language Technologies	Algorithms for NLP (11-711), Neural Networks for NLP (11-747), Advanced Multimodal Machine Learning (11-777), Computational Ethics Lab (11-831)
Machine Learning	Introduction to Machine Learning (10-701), Topics in Deep Learning (10-707)
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

Extra-Curricular Activities

Journalism Involved in journalism during high school and college:

- Awarded **Institute Journalism Special Mention** for the year 2016-17, for contributions made as an Editorial Board Member of Insight, IIT Bombay's official student media body
- Selected as one of 30 Student Correspondents for the Times of India (Student Edition) in 2010, and felicitated as the **Best Student Correspondent** for my journalistic contributions

Quizzing Participated and won accolades in numerous quizzes at city, state and national level:

- Limca Book of Records Quiz, 2010: 1st in Mumbai Finals
- Aqua Regia Science Quiz, 2011: 1st in Mumbai Finals, 5th in Regional Finals
- RBI Economics Quiz, 2012: 1st in Mumbai Finals, 5th in National Finals
- Malhar, 2015: 1st position, representing IIT Bombay in 'Battle of Facts' quiz, at St Xavier's College's Malhar festival

Other

- Recognized as **Student of the Year** for all-round performance by the Times NIE group in 2010
- Awarded **Hostel 8 Cultural Color** for contributions to the inter-hostel Literary Arts General Championship at IIT Bombay during the academic years of 2015-16 and 2016-17
- Completed a student-taught course on **Introduction to Freestyle Rap**