

# Tejas Srinivasan

# Curriculum Vitae

## EXPERIENCE AND EDUCATION

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Fall 2021-	UNIVERSITY OF SOUTHERN CALIFORNIA Ph.D. in Computer Science	Advisor: Prof. Jesse Thomason
2020-21	A.I. FOUNDATION NLP Research Scientist	
2018-20	CARNEGIE MELLON UNIVERSITY Master of Language Technologies (M.L.T.)	GPA: 3.87/4.0 Advisors: Prof. Florian Metze, Prof. Yonatan Bisk
2014-18	INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY Bachelor of Technology in Mechanical Engineering Minor in Computer Science and Engineering	CPI: 9.15/10

## PUBLICATIONS

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2020	<b>Fine-Grained Grounding for Multimodal Speech Recognition</b> <i>Tejas Srinivasan, Ramon Sanabria, Florian Metze, Desmond Elliott</i> Findings of Empirical Methods in Natural Language Processing (EMNLP)	<a href="#">Link</a>
2020	<b>Multimodal Speech Recognition with Unstructured Audio Masking</b> <i>Tejas Srinivasan, Ramon Sanabria, Florian Metze, Desmond Elliott</i> EMNLP Workshop on Natural Language Processing Beyond Text (NLPBT)	<a href="#">Link</a>
2020	<b>Reasoning Over History: Context-Aware Visual Dialog</b> <i>Muhammad Shah, Shikib Mehri, Tejas Srinivasan</i> EMNLP Workshop on Natural Language Processing Beyond Text (NLPBT)	<a href="#">Link</a>
2020	<b>Looking Enhances Listening: Recovering Missing Speech Using Images</b> <i>Tejas Srinivasan, Ramon Sanabria, Florian Metze</i> International Conference on Acoustics, Speech and Signal Processing (ICASSP)	<a href="#">Link</a>
2019	<b>Multitask Learning For Different Subword Segmentations In Neural Machine Translation</b> <i>Tejas Srinivasan, Ramon Sanabria, Florian Metze</i> International Workshop on Spoken Language Translation (IWSLT)	<a href="#">Link</a>
2019	<b>Structured Fusion Networks for Dialog</b> <i>Shikib Mehri*, Tejas Srinivasan*, Maxine Eskenazi</i> Special Interest Group on Discourse and Dialog (SIGDIAL) <b>Best Paper Award</b>	<a href="#">Link</a>
2019	<b>Analyzing Utility of Visual Context in Multimodal Speech Recognition Under Noisy Conditions</b> <i>Tejas Srinivasan, Ramon Sanabria, Florian Metze</i> ICML Workshop on The How2 Challenge: New Tasks for Vision and Language	<a href="#">Link</a>

\* - Equal contribution

## RESEARCH PROJECTS

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- June 2020 - **Measuring Biases in Multimodal Language Models**  
Present *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 - **Multimodal Co-Learning for Robustness to Missing Modalities**  
Present *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 - **Multimodal Speech Recognition Under Noisy Conditions**  
June 2020 *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 - **Unsupervised and Distantly Supervised Frame Discovery**  
Dec. 2019 *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 - **Time-Series Networks for Credit Card Default Prediction**  
Jan. 2020 *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 - **Structured Fusion Networks for Dialog**  
May 2019 *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

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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

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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

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PROGRAMMING	Python, C, C++, MATLAB
TOOLS AND PACKAGES	pyTorch, Keras, TensorFlow, NumPy, SciPy, Pandas, scikit-learn, git, $\text{\LaTeX}$

## ACADEMIC ACHIEVEMENTS

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- 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