VISHAL SUNDER

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RESEARCH INTERESTS

Automatic Speech Recognition, Speech Understanding

EDUCATION

PhD in Computer Science *August 2019 - Present*
The Ohio State University *Overall CPI: 3.9/4.00*
Advisor: Dr. Eric Fosler-Lussier

Bachelor of Technology in Electrical Engineering *May 2016*
Indian Institute of Technology (BHU), Varanasi *Overall CPI: 8.35/10*

PROFESSIONAL EXPERIENCE

Graduate Research Associate *Present*
The Ohio State University
Speech and Language Technologies Lab

Research Intern *May 2022 - August 2022*
IBM Research, Yorktown Heights, USA
Speech Technologies group

Research Intern *May 2021 - August 2021*
IBM Research, Yorktown Heights, USA
Speech Technologies group

Research Engineer *July 2016 - July 2019*
TCS Research, New Delhi, India
Deep Learning and Artificial Intelligence group

PUBLICATIONS

V. Sunder, E. Fosler-Lussier, S. Thomas, HKJ. Kuo, B. Kingsbury. ConvKT: Conversation-Level Knowledge Transfer for Context Aware End-to-End Spoken Language Understanding. *INTERSPEECH-2023.*[Paper]

V. Sunder, S. Thomas, HKJ. Kuo, B. Kingsbury, E. Fosler-Lussier. Fine-grained Textual Knowledge Transfer to Improve RNN Transducers for Speech Recognition and Understanding. *ICASSP-2023.*[Paper]

L. Venkatasubramaniam*, **V. Sunder***, E. Fosler-Lussier. End-to-End word-level disfluency detection and classification in children's reading assessment. *ICASSP-2023.*[Paper] [Code]

V. Sunder, E. Fosler-Lussier, S. Thomas, HKJ. Kuo, B. Kingsbury. Tokenwise Contrastive Pretraining for Finer Speech-to-BERT Alignment in End-to-End Speech-to-Intent Systems. *INTERSPEECH-2022.* [Paper] [Code]

V. Sunder, S. Thomas, HKJ. Kuo, J. Ganhotra, B. Kingsbury, E. Fosler-Lussier. Towards End-to-End Integration of Dialog History for Improved Spoken Language Understanding. *ICASSP-2022.* [Paper]

P. Serai, **V. Sunder**, E. Fosler-Lussier. Hallucination of speech recognition errors with sequence to sequence learning. *IEEE/ACM Transactions on Audio, Speech and Language Processing.* [Paper]

V. Sunder, P. Serai, E. Fosler-Lussier. Building an ASR Error Robust Spoken Virtual Patient System in a Highly Class-Imbalanced Scenario Without Speech Data. *Preprint.* [Paper]

V. Sunder, E. Fosler-Lussier. Handling Class Imbalance in Low-Resource Dialogue Systems by Combining Few-Shot Classification and Interpolation. *ICASSP 2021.* [Paper] [Code]

V. Sunder, A. Srinivasan, L. Vig, G. Shroff, R. Rahul: One-shot information extraction from document images using neuro-deductive program synthesis. *NeSy workshop, IJCAI 2019.* [Paper]

G. Gupta, **V. Sunder**, R. Prasad, G. Shroff. CRESA: A Deep Learning Approach to Competing Risk Recurrent Event Survival Analysis. *PAKDD-2019.* [Paper]

V. Sunder, L. Vig, A. Chatterjee, G. Shroff. Prosocial or Selfish? Agents with different behaviors for Contract Negotiation using Reinforcement Learning. *ACAN workshop, IJCAI 2018.* [Paper]

V. Sunder, M. Yadav, L. Vig, G. Shroff. Information Bottleneck Inspired Method for Chat Text Segmentation. *IJCNLP 2017.* [Paper]

PATENTS

V. Sunder, L. Vig, A. Chatterjee, G. Shroff. Method and system for performing negotiation task using reinforcement learning agents. *US Patent 11,521,281.* [Link]

SELECTED RESEARCH PROJECTS

The Virtual Patient project @ OSU [May 2020 - April 2021]

- Developed a novel pairwise training framework for handling long-tailed class imbalance issue in a domain specific question classification dataset.

- Built an ASR error robust NLU system by utilizing an ASR error simulation framework.

- Work published at ICASSP-2021 and the TASLP journal.

Robust end-to-end speech understanding @ OSU & IBM Research [May 2021 - present]

- Built a fully end-to-end speech understanding system to integrate dialog history in speech form.

- Designed a learning paradigm to align acoustic and LLM embeddings at the token level.

- Ongoing work on integrating speech encoders and LLM layers to facilitate end-to-end learning.

- Work published at ICASSP-2022, INTERSPEECH-2022, ICASSP-2023, INTERSPEECH-2023.

Deep Learning models for children's reading assessment @ OSU [May 2022 - present]

- Built an end-to-end disfluency detection and classification system for children read speech using a novel hierarchical training framework.

- Built an end-to-end real-time tracking system for children read speech using pointer networks.

- Work published at ICASSP-2023.

TECHNICAL SKILLS

Languages: Python, **DL frameworks:** PyTorch, **Other tools:** MATLAB, LATEX

ACADEMIC SERVICE

Reviewer - ICLR 2023