






Darshan Deepak Prabhu 
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Examination	University	Institute	Year	Grade
Post Graduation	IIT Bombay	IIT Bombay	2023	9.76
Graduation	JSS University	JSS University	2020	9.41

RECENT PUBLICATIONS

- Ashish Mittal*, Darshan Prabhu*, Sunita Sarawagi, Preethi Jyothi. **SALSA: Speedy ASR-LLM Synchronous Aggregation**, in **Interspeech, 2024**. [nominated for Best Student Paper award] 
- Darshan Prabhu, Yifan Peng, Preethi Jyothi, Shinji Watanabe. **MULTI-CONVFORMER: Extending Conformer with Multiple Convolution Kernels**, in **Interspeech, 2024**. 
- Darshan Prabhu*, Abhishek Gupta*, Omkar Nitsure, Preethi Jyothi, Sriram Ganapathy. **Improving Self-supervised Pre-training using Accent-Specific Codebooks**, in **Interspeech, 2024**. 
- Darshan Prabhu, Preethi Jyothi, Sriram Ganapathy, Vinit Unni. **Accented Speech Recognition With Accent-specific Codebooks**, in **EMNLP, 2023**. 
- Darshan Prabhu, Saiganesh Mirishkar, Pankaj Wasnik. **Efficient infusion of self-supervised representations in Automatic Speech Recognition**, in **ENLSP Workshop, NeurIPS 2023**. 

AWARDS

- Dr. George B Fernandes Award for Excellence in Research** by IIT Bombay for the work done during my M.Tech. *July 2023*
- Microsoft Research Travel Grant** to attend EMNLP 2023. *December 2023*
- ISCA Travel grant and Microsoft Research Travel Grant** to attend Interspeech 2024. *October 2024*

THESIS AND SEMINAR

Improving Accented Automatic Speech Recognition using Cross-attention *M.Tech Project*
Prof. Preethi Jyothi *Jul '22 - June '23*

- Objective: Building a novel accent adaptation approach for end-to-end ASR systems using **cross-attention** with a trainable set of **codebooks**.
- Experimented with the modified **Conformer** architecture and a **novel beam search** approach that yielded significant performance gains on both seen and unseen accents and in the zero-shot setting.

Domain Adversarial approaches for accented ASR *M.Tech Seminar*
Prof. Preethi Jyothi *Jan '22 - May '22*

- Reviewed approaches to accented speech recognition with an emphasis on **accent agnostic** approaches.
- Implemented few existing methodologies that focus on training **transformer** architecture for speech recognition with a **domain adversarial** objective.
- Explored enhancements to the existing architecture by introducing **contrastive loss** as a surrogate objective for the discriminator.

WORK EXPERIENCE

Research Intern | Audio Content Analysis *July '23 - May '24*
Sony Research India

- Objective: Improving the robustness of speech recognition models using **self-supervised pretrained** models like **Wav2Vec** and **Hubert**.
- Experimenting with a modified conformer architecture on Librispeech and Tedlium datasets that introduces **cross-attention** within the encoder, obtaining considerable reductions in WER on test sets.

Research Assistant | CSE department Webteam *Aug '20 - June '23*
Indian Institute of Technology, Bombay

- Redesigned and developed the **official website** for the CSE department using **Angular**.

- Developed, deployed, and maintained tools internal to the department using **Django** and **Nginx**. Notable among them are the grading portal, course management portal, etc.

Research Intern | Prof. Sriram Ganapathy, LEAP Lab
Indian Institute of Science, Bangalore

May '22 - Jul '22

- Objective: Improving the accent robustness in speech recognition using **cross attention** between speech and accent embeddings.
- Experimented with a modified conformer architecture on Mozilla CommonVoice dataset that introduces **cross-attention** within the encoder obtaining a 10% relative reduction in the WER on some accents.
- The work is submitted to "IEEE Spoken and Language Technology Workshop" (SLT 2022) conference.

COURSE PROJECTS

Interpretability of Convolution Layers for Image Processing

Autumn 2020

CS725: Foundations of Machine Learning

Prof. Preethi Jyothi

- Developed a pipeline to understand and visualize the **kernels** in a trained convolutional neural network.
- Designed a **user interface** in **Django** and **Semantic UI** to perform visualization of kernel behaviors for images using the VGG-19 model.
- Experimented with multiple datasets, namely Mnist digit, Dogs vs. Cats and Flower. Compelling conclusions were drawn based on visualizations and ablation studies.

Zero-shot Image Classification

Spring 2020

CS726: Advanced Machine Learning

Prof. Sunita Sarawagi

- Designed an architecture to perform **zero-shot** image classification by posing **image captioning** as a **classification** task.
- Conducted experiments with COCO dataset, integrated **LIME** explainability tool to interpret the model, and designed a user interface to showcase them.

Multi Task Learning for POS tagging and Chunking

Autumn 2020

CS626: Speech, Natural Language Processing and the Web

Prof. Pushpak Bhattacharya

- Objective: Performing POS tagging and chunking jointly in a **multi-tasking** setup.
- Experimented with CoNLL dataset, and obtained 2.5% and 2.8% relative improvements in POS tagging and chunking over baseline.

Curriculum Learning for Speech Recognition

Autumn 2021

RnD Project

Prof. Preethi Jyothi

- The objective was **selective exposure of speech recognition model** to the dataset with the primary goal of increasing the robustness of the model.
- Carried out experiments with various curriculum strategies over **Mozilla CommonVoice** dataset using the **Wav2Vec2** architecture.

TECHNICAL SKILLS

Programming Languages	Python, Javascript, Typescript, SQL, C++
Toolkits	ESPnet, Speechbrain, Fairseq, Huggingface
Technologies	Linux, Git, Docker, L ^A T _E X

POSITIONS OF RESPONSIBILITY

Placement Web Coordinator, IIT Bombay

Jun '21 - Jul '22

- Currently coordinating a team of 7 members to develop the new placement portal catering to the needs of **4000+ students, coordinators and recruiters** using **Angular** and **NestJS**.
- Responsible for ensuring the smooth functioning of the placement website and associated services.
- Migrated the legacy system to a **docker** orchestrated environment and updated portal functionalities prioritizing scalability and maintainability.

Technical Coordinator, Linux Campus Club, JSSSTU

Jul '17 - Jul '19

- Worked with a team of 20 members that **taught 200+ students** various programming languages and trending topics in Computer Science, which were not covered in the course curriculum.
- Conducted unorthodox coding **competitions** and **hackathons** to develop student's reasoning ability and coding skills.