Shailashree K Sheshadri

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Advancing multilingual NLP by addressing fundamental representation and learning bottlenecks, with proven impact on one of the most challenging benchmarks: low-resource Indic language translation.

PRESENT

AUG 2018 – PRESENT

DOCTOR OF PHILOSOPHY, AMRITA VISHWA VIDYAPEETHAM

Affiliation – Department of Computer Science and Engineering, Amrita School of Computing, Bengaluru, Amrita Vishwa Vidyapeetham, India.
Supervisor – Dr. Deepa Gupta, Professor, Dept. of CSE, Amrita School of Computing, Bengaluru, Amrita Vishwa Vidyapeetham, India.
Domain – Multilingual Neural Machine Translation for Indian languages
Funding Agency – DRDO, New Delhi
CGPA during coursework – 9.18.
Google Scholar Link – https://scholar.google.co.in/citations?user=-64x0PAAAAAJ&hl=en
Work Description:

- Addressing representation and learning bottlenecks in NLP and LLMs, including tokenization bias, embedding distortion, and poor cross-lingual generalization in morphologically rich languages.
- Designing typology-aware modular architectures with dynamic expert routing and hierarchical language grouping, enabling scalable adaptation across low- and zero-resource settings.
- Integrating hyperbolic geometry, contrastive learning, and continual learning strategies to improve semantic alignment and incremental language adaptation.
- Developing semi-supervised and unsupervised pipelines (e.g., back-translation, entropy-regularized alignment) to overcome parallel corpus scarcity.
- Engineering GPU-optimized training and decoding pipelines, achieving significant improvements in efficiency and translation accuracy for low-resource Indic languages such as Kannada, Bodo, Nepali, Kashmiri, and Dogri.
- Teaching Assistant (2022–2024): Delivered lab sessions on NLP, deep learning, and neural machine translation for undergraduate and postgraduate students.

INDUSTRY EXPERIENCE

AUG 2015 – AUG 2018

PROJECT ENGINEER, CDAC MUMBAI

- **Automatic Speech Recognition**
  - Citizen Contact Centre project: funded by DietY.
  - The aim of the project was to create a common contact center across the country for getting the details about various certificates and schemes provided by the central Govt.
  - This is a voice-based service where in the customer calls a toll-free number utters the service or the scheme whose details he intends to know.
  - The ASR model created was demonstrated to the Department and won a great appreciation and the accuracy achieved was 92% to 94%.
  - The various reasons that contributed to this fluctuation of accuracy were noise in the speech, female and child speech features. Each team was assigned a topic for further research to improve the quality. I undertook speech enhancement via noise reduction. I used Deep Convolutional Generative Adversarial Nets and achieved marginal improvement.
- **Natural Language Processing** – Worked on Keyword spotting, Semantic Analysis and Machine Translation.
- **Conversational Speech Recognition(Research based)** – Worked on recognition of speech at sentence-level by investigating the parameters(dis-fluency in speech, variations in the wave envelope for male, female and child voice, native and non-native speaker) that effect the accuracy of speech recognition with the help of Natural Language Processing techniques.
- Developed end-to-end speech recognition model for intra office employee name recognition with an accuracy of 95%.
- **Machine Translation** – Created translation models for Dravidian languages i.e., English to Hindi/Telugu/Tamil and vice-versa,
- Participated in MTIL 2017 Machine Translation competition and WMT 2018 with the team.

DEC 2015 – JULY 2016

TRAINING AT IIT MADRAS

- Worked as trainee at IIT Madras under the guidance of Prof. Umesh.
- Worked on DNN-based end-to-end speech recognition system for Mandi Project carried by ASR consortium. In this, I worked on Automatic Speech Recognition for Hindi language.

- I have also created speech data collection module which included preparation of questionnaire, preparing scripts for recording and integration with asterisk.

EDUCATION

FEB 2015 – AUGUST 2015

POST GRADUATION DIPLOMA IN ADVANCED COMPUTING, **CDAC PUNE (VITA)**

This is a 6-month training program in web programming, Advanced Web programming, core and advanced java, PL/SQL, data structures and algorithms, Operating systems subjects.

- **Percentage** – 72.13%

JUNE 2012 – JUNE 2014

M.TECH IN COMPUTER SCIENCE AND ENGINEERING, **SHARDA UNIVERISTY**

- **Specialization** – Computer Networks and Artificial Intelligence.
- **Thesis** – Path planning and re-planning of the mobile agents using heuristic approach based on Artificial Intelligence algorithms.
- **Research Paper** – *Shailashree KS, Kiran K Ravulakollu*, "Ds* Heuristic Approach Using 'Safety Distance' For Agent Path Planning", IOSR-JCE, 2014.
- **Link** - https://www.researchgate.net/publication/262103750_Ds_Heuristic_Approach_using_%27Safety_Distance%27_for_Agent_Path_Planning
- **Guide** – Dr. Kiran Kumar Ravulakollu.
- **CGPA** – 9.361 out of 10.00 (2nd Rank in the university)

JUNE 2008 – JULY 2012

B.TECH IN INFORMATION TECHNOLOGY, **USHA MITTAL INSTITTUTE OF TECHNOLOGY**

- **University –** SNDT University

- **Specialization –** Signal and Image Processing
- **Project –** Speckle noise reduction in SAR and ultrasound images using Speckle Reducing Anisotropic Diffusion technique.
- **Guide –** Dr. Sanjay Shitole
- **CGPA –** 3.65 out of 4.00

JUNE 2007 – JUNE 2008

12TH, THAKUR COLLEGE OF SCIENCE AND COMMERCE, **HSC BOARD**

- **Branch** – Information Technology
- **Percentage** – 85.33%

JUNE 2005 – JUNE 2006

10TH, CAMBRIDGE SCHOOL, **ISCE BOARD**

- **Percentage** – 85.33%

SKILLS

- **Core Subject Strength**
  - Data structures and algorithms
  - Machine Learning, Deep Learning
  - Database System
  - Speech and Natural Language Processing
- **Specialization**
  - Natural Language Processing – Neural Machine Translation
  - Speech Recognition
- **Software Skills**
  - C, C++, Shell scripting, Python, MATLAB, Cuda Programming.
- **Toolkits**
  - Kaldi Speech Recognition Toolkit
  - NLTK
  - MATLAB

COMPETITIONS ATTENDED:

INDIA HACKS 2017 – HACKATHON IN ARTIFICIAL INTELLIGENCE - WON 8TH PLACE ON ALL INDIA BASIS.

Health Expert System (Emergency Response System) using Speech processing (recognize symptoms and current location to avail the connectivity to the nearest hospital) and Natural Language Processing (keyword spotting and semantic analysis) techniques.

CONFERENCES ATTENDED:

1. IIT Madras – June 2016
    a. Workshop on Automatic Speech Recognition conducted by IIT Speech Consortium headed by Dr. Hema Murthy and Dr. Umesh S.
2. WiSSAP – January 2016
    a. Workshop on Speech Prosody by eminent speakers like Mark Johnson, Dr. Kalika Bali etc., held at SSN College, Chennai.
3. HiPC, Hyderabad – December 2019
    a. Conference on High Performance Computing and its applications to various domains like Sequence-to-Sequence Predictions in NLP, Genome Sequencing, Language Modelling, and Speech Recognition.
4. ISTA Bengaluru – December 2023
    a. Presented the conference paper titled – KasNAT : Non-Autoregressive Machine Translation for Kashmiri to English using Knowledge Distillation.
    b. This paper was also selected to Journal of Fuzzy Systems (The best papers at conference were also selected to IOS Press Journals). The Impact Factor is 2.