Saurabh Kumar

Mahendru – 800006 Patna – India

+91 7091879126 • saurabhk0317@gmail.com
in saurabhk0317

Research Interests

Speech Processing, Automatic Speech Recognition, Deep Learning, Speaker Recognition, Speech Emotion Recognition, Signal Processing

Education

National Institute of Technology Patna   **Patna, India**
B. Tech. in Electronics and Communication Engineering, CGPA: 7.42/10   2020

M S College Bhagalpur   **Bhagalpur, India**
Intermediate of Science, Aggregate: 79.0%   2016

S D N High School Paharpur, Dighi   **Godda, India**
Matriculation, Aggregate: 77.2%   2013

Research Experience

Undergraduate Research   August 2019 – June 2021
Dept. of ECE, NIT Patna   *Patna, India*
Supervisor: Dr. Syed Shahnawazuddin

Description:

o Developed robust children's speech recognition systems in low-resource conditions;

o Studied front-end feature enhancement techniques to improve the performance of automatic speech recognition systems in acoustically challenging environments;

o Improved the performance of children's mismatched speaker verification systems;

o Implemented a self-attention based convolutional neural network for speech emotion classification.

Major Project   January 2020 – May 2020
Dept. of ECE, NIT Patna   *Patna, India*
Supervisor: Dr. Rakesh Ranjan

Title: Simulation of hybrid plasmonic waveguides and its applications

Description: The goal of this project was to simulate and study the characteristics of various hybrid plasmonic waveguide-based devices using COMSOL Multiphysics software.

Summer Internship   May 2019 – July 2019
IIT Guwahati   *Guwahati, India*

Title: Cascade filter bank implementation of discrete wavelet transform

Description: The primary objective of this project was to implement a 5-stage cascade filter-bank structure of discrete wavelet transform in Verilog.

Publications

Peer-reviewed

S. Shahnawazuddin, A. Kumar, **Saurabh Kumar**, and W. Ahmad, "Enhancing robustness of zero resource children's speech recognition system through bispectrum based front-end acoustic features," *Digital Signal Processing*, vol. 118, p. 103 226, 2021, ISSN: 1051-2004. DOI: https://doi.org/10.1016/j.dsp.2021.103226.

S. Shahnawazuddin, A. Kumar, V. Kumar, **Saurabh Kumar**, and W. Ahmad, "Robust children's speech recognition in zero resource condition," *Applied Acoustics*, vol. 185, p. 108 382, 2022, ISSN: 0003-682X. DOI: https://doi.org/10.1016/j.apacoust.2021.108382.

S. Shahnawazuddin, **Saurabh Kumar**, A. Kumar, and W. Ahmad, "Enhancing Robustness of Zero-Resource Children's Speech Recognition System," *Digital Signal Processing*, Under-review.

S. Shahnawazuddin, A. Kumar, **Saurabh Kumar**, and W. Ahmad, "A Novel Vowel Non-Vowel Segmentation Technique with Application in Noise Robust Children's ASR," *IEEE Transactions on Audio, Speech, and Language Processing*, Under-review.

S. Shahnawazuddin, **Saurabh Kumar**, A. Kumar, and W. Ahmad, "Out-of-Domain Data Augmentation Based on Formant Scaling for Robust Children's Speaker Verification in Low-Resource Conditions," Submitted to ICASSP 2022.

——, "Enhancing Robustness of Zero-Resource Children's ASR Through Histogram Equalization on Bispectrum Based Front-End Features," Submitted to ICASSP 2022.

Skills

Computer skills

Programming: Python, Shell Script, Verilog, C

Software Packages: Matlab, COMSOL Multiphysics, Vivado

Tools: Kaldi, TensorFLow, Keras, LaTex

Operating Systems: Linux, Windows, Mac OS X

Languages

o English
o Hindi

Relevant Undergraduate Coursework

o 7CS157: Soft and Evolutionary Computing

- 6EC143: Fuzzy Logic and Neural Network
- 5EC117: Digital Signal Processing
- 5CS171: Information Security
- 4MA109: Linear Algebra
- 3MA104: Tools for Applied Mathematics
- 3EC109: Signals and System Analysis
- 2MA102: Engineering Mathematics - II
- 2CS101: Introduction to Computing
- 1MA101: Engineering Mathematics - I

Extracurricular Activities

- Attended a five days TEQIP-III sponsored workshop on Machine Learning & Speech Processing, conducted by the Dept. of ECE, NIT Sikkim, in February 2021.
- Attended a two days workshop on embedded systems, organized by TechieNest Pvt. Ltd., in October 2017.
- Attended a summer training program on Core Java, organized by Oracle through RCPL India, in May 2017.
- Co-organized a fundraising to help flood-affected people of Bihar in 2017.
- Participated in drama event of annual cultural fest of 2017 at NIT Patna.

Position of Responsibilities

- Web coordinator of Yoga and Meditation Club of NIT Patna in 2018-19.
- Member of annual cultural fest 2018 organizing committee of NIT Patna.

References

Dr. Syed Shahnawazuddin
Assistant Professor
Dept. of ECE, NIT Patna
Ashok Rajpath, Mahendru
Patna, Bihar (800005)
+91 7544012984
s.syed@nitp.ac.in

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