PRACHI SINGH

PhD Scholar
LEAP Lab
Electrical Engineering
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RESEARCH INTERESTS

Speaker Diarization, Machine Learning, Variational Inference, Metric Learning, Self-supervised learning, Graph based Clustering.

SKILLS

Languages	Python, C, C++, Shell
Libraries	Kaldi, Pytorch, OpenCV
Software & Tools	Spyder, Jupyter Notebook, MATLAB, MS Office,Visual Studio

EDUCATION & COURSES

Ph.D. *2017 - Present*
Electrical Engineering (CGPA : 8.00/10)
Indian Institute of Science, Bangalore

B.Tech *2011 - 2015*
Electronics & Telecommunication (CGPA : 8.67/10)
College of Engineering, Pune

Courses

- Machine Learning for Signal Processing
- Pattern Recognition and Neural Networks
- Data Structures
- Computational Methods of Optimization
- Speech Information Processing
- Stochastic Models and Applications
- Matrix Theory
- Detection and Estimation Theory

EXPERIENCE

Software Modelling Engineer

Fiat Chrysler Automobiles

July 2015 - July 2017

- Electronic Control Unit(ECU) modelling and Network Management using CAN communication, Hardware In Loop Testing and Validation of Infotainment system.

ACHIEVEMENTS

- Interview published in theinterviewportal.com for career guidance.
- ISCA Travel Grant for INTERSPEECH, 2019
- Runner-up in “Second DIHARD Challenge 2019" , April 2019
- Late Shri Manoharbhai Patel Memorial Gold Medal in XII Std
- Dhirubhai Foundation Scholarship in XII Std

RECENT PROJECTS

Research advisor: Dr. Sriram Ganapathy

Third DIHARD speech diarization Challenge

- Contributed in baseline system setup for the DIHARD-III challenge. It involves task to partition an audio into speaker segments, in challenging environment where the audio is corrupted with noise, music, babble etc. and contains short speaker turns. It has applications in rich-text transcription of meetings, clinical diagnosis etc.
- Team Lead of our LEAP team from IISc in the challenge which ranked 7^{th} out of 23 teams across globe.
- Our system involved End-to-End diarization based on transformers for telephone conversation. We also introduced graph based clustering called as path integral clustering for diarization.

Self-supervised Speaker Diarization

- This work involves learning representations using clustering based loss. The task is self-supervised because we learn the representations using the clustering output given by the Clustering algorithm to make the representations more speaker discriminative. Accepted in INTERSPEECH 2020

PUBLICATIONS

- **P. Singh** and S. Ganapathy, “Deep Self-Supervised Hierarchical Clustering for Speaker Diarization", INTERSPEECH 2020.
- S. Ramoji, P. Krishnan, B. Mysore, **P. Singh**, S. Ganapathy, “LEAP System for SRE19 Challenge – Improvements and Error Analysis", Speaker Odyssey Workshop 2020.
- S. Ramoji, P. Krishnan, B. Mysore, **P. Singh**, S. Ganapathy, “Pairwise Discriminative Neural PLDA for Speaker Verification", arXiv 2020.
- **P. Singh**, Harsha Vardhan MA, S. Ganapathy, A. Kanagasundaram, “LEAP Diarization System for the Second DIHARD Challenge", INTERSPEECH 2019.
- A. Kanagasundaram, S. Sridharan, S. Ganapathy, **P. Singh**, C. Fookes, “A Study of X-vector Based Speaker Recognition on Short Utterances", INTERSPEECH 2019.
- S. Ramoji, A. Mohan, B. Mysore, A. Bhatia, **P. Singh**, Harsha Vardhan, S. Ganapathy, “The LEAP Speaker Recognition System for NIST SRE 2018 Challenge", ICASSP 2019.

WORKSHOPS AND CONFERENCES

- Women in Research Talk, PyConIndia 2020, Online
- Winter School on Speech and Audio Processing (WiSSAP) 2020,IIT Mandi, India
- Presented paper and poster in Interspeech 2019, Graz, Austria
- Summer school on mathematics for data science 2019 organised by IFCAM and IISc
- Winter School on Speech and Audio Processing (WiSSAP) 2019, Trivandrum, India
- Interspeech 2018, Hyderabad, India
- Brain Computation and Learning Workshop, 2018, Bangalore, India
- International Conference on Signal Processing and Communications(SPCOM), 2018

TEACHING EXPERIENCE

- Teaching Assistant
  Advanced Deep Learning [E9:309]
  Fall 2020
- Teaching Assistant
  Deep learning theory and Practice [CCE]
  Spring 2020
- Teaching Assistant
  Machine Learning and Signal Processing [E9:205]
  Fall 2019