Shruti Rajendra Kshirsagar

2285 Saint-Mathieu Street, Apt 907, Montreal, Quebec H3H 2J7, Canada
https://shrutikshirsagar.github.io/ | (+1) 438-725-4117 | shruti.kshirsagar@emt.inrs.ca

RESEARCH INTEREST

Deep Learning, Machine Learning, Speech Processing, Signal Processing, Emotion Recognition, Artificial Intelligence, Sound Recognition

EDUCATION

Institut national de la recherche scientifique, Montreal, Canada ***January 2018 – Present***
PhD in Telecommunications | GPA: 4.0/4.3
Advisor: Dr. Tiago H. Falk (Director, MuSAE Lab)

Mumbai University, India ***August 2014 – July 2016***
Masters in Electronics and Telecommunication Engineering
Specialization: Signal Processing | CGPA: 9.08/10
Advisor: Dr. Preeti Rao (Professor, IIT Bombay)

Mumbai University, India ***August 2010 – May 2014***
Bachelors in Electronics and Telecommunication Engineering
Percentage: 72.64% (First Class with Distinction)

PUBLICATIONS $ PRESENTATIONS

- [C1] Avila, S. Kshirsagar, A. Tiwari, D. Lafond, D. O'Shaughnessy, and T. Falk, " Speech-based stress and emotion classification based on modulation spectral features and convolution neural networks ", EUSIPCO 2019, Spain.
- [C2] Gaballah, Amr, Anderson Avila, Joao Monteiro, Parth Tiwari, Shruti Kshirsagar, and Tiago H. Falk. "Development of the INRS-EMT Scene Classification Systems for the 2020" DCASE challenge 2020
- [C3] Tiwari, P., Jain, Y., Avila, A., Monteiro, J., Kshirsagar, S., Gaballah, A., & Falk, T. H. Modulation Spectral Signal Representation and I-vectors for Anomalous Sound Detection, DCASE challenge 2020.
- [C4] S. Barhate, S. Kshirsagar, N. Sanghvi, K. Sabu, P. Rao and N. Bondale " Prosodic Features of Marathi News Reading Style ", Proc. of IEEE TENCON, Nov 2016, Singapore.
- [C5] P. Rao, H. Mixdorff, I. Deshpande, N. Sanghvi and S. Kshirsagar " A Quantitative Study of Focus Shift in Marathi ", Proc. of Speech Prosody, May 2016, Boston, U.S.A.
- [J1] S. Kshirsagar, T. Falk, "Quality-Aware Bag of Modulation Spectrum Features for Robust Speech Emotion Recognition" , submitted IEEE transaction on affective computing, Sep 2021
- [J2] T. Falk, A. Tiwari, R. Casani, S.Kshirsagar, D. Tobon, Y. Sue, "Modulation Spectral Signal Representation for Quality Measurement and Enhancement of Wearable Device Data: An Overview" , submitted to Frontiers in Electronics, section Wearable Electronics, September 2021.
- [J3] Y. Zhu, A. Tiwari, J. Monteiro, S. Kshirsagar, T. Falk, "COVID-19 Detection via Fusion of ModulationSpectrum and Linear Prediction Speech Features ", submitted to IEEE trans on audio, speech, and language processing., September 2021
- [P1] Poster presentation on " Prosodic Features of Marathi News Reading style" at TENCON- International Technical Conference of IEEE Region 10 (2016), Singapore
- [P2] Poster presentation on "Multimodal emotion recogntion "in the wild" at STARaCOM- Industrial meetup (2019), Montreal, Canada.
- [P3] Poster presentation on "Exploring Domain Adaptation for Monolingual and Cross-lingual Speech Emotion Recognition"- at ACM Canadian Celebration of women in computing conference (2019), Toronto, Canada.
- [Master's Thesis] S. Kshirsagar, B. Markarkandi, P. Rao, "Determination Of Acoustic Parameters Of Marathi Prosody ", June 2016.

EXPERIENCE

Machine Learning for Audio Analytics Intern | Robert Bosch Inc, Mississauga, Ontario, Canada June 2021-October 2021
- Investigated a Non-negative matrix-based features for overlapping audio event detection and localization task.
- Explored a deep learning-Transformer based models for audio event detection and localization task.
- Investigated various signal processing-based features with the recent state-of-the-art deep learning models.

Research and development Intern | Lisnen Canada, Toronto, Ontario **August 2020-December 2020**

- Worked on data preparation and feature analysis for sound recognition.
- Worked on developing a mobile based hearing assistive application to provide situation awareness.
- Worked on developing a deep learning and machine learning based model and proposed environmental robust features and algorithms for acoustic event detection task.

MITACS Accelerate Research Intern | Thales Canada, Quebec ***May 2018 – September 2018***

Supervisor: Dr. Daniel Lafond

- Multi-modal speech emotional (stress) recognition using LSTM.
- Stress detection from speech signal.
- Investigated the effects of different noise types and noise levels on the speech data.
- Employed domain adaptation for cross-language emotion detection

Research Assistant | Nanyang Technological University, Singapore ***May 2017 – August 2017***

Supervisor: Prof. Chng Eng Siong (Head, Speech and Language Group)

- Worked on "Analysis of prosodic pattern for the speech emotion recognition".
- Analyzed pitch patterns for the different emotions.
- Conducted experiments to investigate novel features for speech emotion recognition using DNN.

Masters Dissertation Thesis | Indian Institute of Technology Bombay, India ***August 2015 – June 2016***

Supervisor: Prof. Preeti Rao (Head, Digital Audio and Processing Lab)

- Studied the pitch, intensity and duration of utterances using techniques such as one-way ANOVA.
- Identified the acoustic correlates of stress in Marathi language using MATLAB and PRAAT.
- Modelled these acoustic features in different lexical stress locations and focus types.

Summer Intern | Doordarshan Kendra (National Television Channel, India) ***July 2013***

- Field study of signal processing equipment used in broadcasting.
- Understood and visualized the signals at each stage of transmission

Private Tutor ***May 2015 – December 2016***

Taught following courses to undergraduate engineering students:
Signal and Systems, Random Signal analysis, Linear Algebra, Probability and Random Variables

Research Mentor: Mitacs Globalink Research Internship: Anurag Pendyala. **May 2021- August 2021**

TECHNICAL PROFICIENCY

Python, TensorFlow, PyTorch, Praat, MATLAB, Linux

RELEVANT COURSES

Applied Machine Learning, Learning Representations-Deep Learning, Speech Communications, Speech Signal Processing.

EXTRA-CURRICULAR:

Academic

- Exchange student at McGill University. *Fall 2018*
- Exchange student at University de Montreal *Spring 2018*
- Took advanced courses in speech processing at IIIT Hyderabad, India *January 2017-December 2017*
- Formulated solutions for engineering exams held between years 2011 – 2014 by Mumbai University *February 2015*

Honors & Awards

- MITACS Accelerate Internship Grant August 2020 - April 2021
- MITACS Accelerate Internship Grant *Summer 2018*
- MuSAE Lab Grant *January 2018 – December 2021*
- INRS International Student Scholarship *January 2018 – December 2021*
- NTU Singapore 'Tamasek Lab Research Grant' for International Internship *Summer 2017*
- IIIT Hyderabad Language Technologies Research Center Lab Grant *January 2017 – December 2017*
- IIT Bombay Digital Audio and Processing Lab Grant *April 2016 – June 2016*
- Graduate Aptitude Test in Engineering (GATE) Scholarship for Masters *August 2014 – July 2016*

Organization

- Association for the Advancement of Affective Computing
- IEEE Signal Processing Society
- IEEE Women in Engineering
- Women in Machine Learning