

SHRUTI RAJENDRA KSHIRSAGAR

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RESEARCH INTEREST

Deep Learning, Machine Learning, Speech Signal Processing, Affective computing, Artificial Intelligence, Sound Recognition

EDUCATION

Institut national de la recherche scientifique, Montreal | PhD Telecommunications Jan 2018 - Sept 2022
· *Specialization: Speech & Deep Learning | Advisor: Dr. Tiago H. Falk | GPA 4.0/4.3*
University of Mumbai, Mumbai | ME Electronics & Telecommunication Engineering Aug 2014 - July 2016
· *Specialization: Signal Processing | Advisor: Dr. Preeti Rao | GPA 9.08/10*
University of Mumbai, Mumbai | BE Electronics & Telecommunication Engineering Aug 2010 - May 2014
· *Percentage: 72.64 (First Class with Distinction)*

EXPERIENCE

Audio R&D Scientist | EERS Global Technologies Inc, Montreal Jun 2022 - Present
· Investigating state-of-the-art denoising algorithms
· Investigating multi-task based deep learning network for heart rate estimation
Machine Learning for Audio Analytics Intern | Robert Bosch Inc, Mississauga Jun 2021 - Oct 2021
· Investigated non-negative matrix-based features for overlapping audio event detection tasks
· Explored deep learning transformer based models for audio event detection tasks
· Investigated various signal processing-based features with the recent state-of-the-art deep learning models
Research and development Intern | Lisnen Canada, Toronto Aug 2020 - Dec 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 tasks
MITACS Accelerate Research Intern | Thales Canada, Quebec City May 2018 - Sep 2018
· Supervisor: Dr. Daniel Lafond
· Multi-modal speech emotional (stress) recognition using LSTM
· Stress detection from speech signals
· 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 - Aug 2017
· Supervisor: Prof. Chng Eng Siong
· Worked on analysis of prosodic patterns for 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 Aug 2015 - Jun 2016
· Supervisor: Prof. Preeti Rao
· 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
· Modeled 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

TECHNICAL SKILLS

Python, TensorFlow, PyTorch, Scikit-learn. Praat, MATLAB, Linux
Relevant courses: Applied ML (McGill), Deep Learning (UdeM), Speech Communications, Speech Signal Processing

HONORS, AWARDS & ORGANIZATIONS

Awards: MuSAE Lab Grant, Jan 2018 - Dec 2021 | INRS International Student Scholarship, Jan 2018 - Dec 2021 | MITACS Accelerate Internship Grant, Aug 2020 - Apr 2021 | MITACS Accelerate Internship Grant, Summer 2018 | IIIT Hyderabad Language Technologies Research Center Lab Grant, Jan 2017 - Dec 2017 | NTU Singapore ‘Tamasek Lab Research Grant’ for International Internship, Summer 2017 | IIT Bombay Digital Audio and Processing Lab Grant, Apr 2016 - June 2016 | Graduate Aptitude Test in Engineering (GATE) Scholarship for Masters, Aug 2014 - Jul 2016 |

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

PUBLICATIONS & PRESENTATIONS

- C1 Avila, S. Kshirsagar, A. Tiwari, D. Lafond, D. O’Shaughnessy, and T. Falk, [Speech-Based Stress Classification based on Modulation Spectral Features and Convolutional Neural Networks](#)”, EUSIPCO 2019, Spain
- C2 Gaballah, Amr, Anderson Avila, Joao Monteiro, Parth Tiwari, Shruti Kshirsagar, and T. 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., T. Falk. [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](#) , IEEE transaction on affective computing, May 2022.
- 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: A Technical Note](#) , Sensors, 2022.
- J3 S. Kshirsagar, T. Falk, [Cross-Language Speech Emotion Recognition Using Bag-of-Word Representations, Domain Adaptation, and Data Augmentation](#), Sensor 2022.
- J4 S. Kshirsagar, A. Pendyala, T. Falk, ”sk-Specific Speech Enhancement and Data Augmentation for Improved Multimodal Emotion Recognition Under Noisy Conditions”, under review [Frontiers in computer Science](#), 2022
- J5 Y. Zhu, A. Tiwari, J. Monteiro, S. Kshirsagar, T. Falk, “COVID-19 Detection via Fusion of Modulation Spectrum and Linear Prediction Speech Features “, under review in [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 recognition ”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
- T1 S. Kshirsagar, B. Markarkandi, P. Rao, ”Determination Of Acoustic Parameters Of Marathi Prosody ”, MAster’s thesis, June 2016
- T2 S. Kshirsagar, T. Falk, ”Affective Human-Machine Interfaces: Towards Multi-lingual, Environment-Robust Emotion Detection from Speech ”, PhD thesis, Spetember 2022