Rutuja Ubale

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EDUCATION

University of California, Los Angeles — Sep 2015 – Dec 2016
Master of Science in Electrical Engineering — **GPA: 3.6 / 4.00**
Advised by Prof. Dr. Abeer Alwan

Courses: Speech Processing, Natural Language Processing, Data Science, Machine Learning, Statistical Programming, Big Data: Modeling and Mining the Web, Graphs and Network Flows, Linear Programming

Vishwakarma Institute of Technology, University of Pune, India — Jul 2011 – May 2015
Bachelor of Technology in Electronics Engineering — **GPA: 9.23 / 10.00**
Honors in VLSI Design
Rank: 3/ 111

Courses: Digital signal processing, Pattern Recognition, Digital Image Processing, Optimization Techniques, Embedded Systems, Data structures and algorithms, Coding and Data Compression, Computer Programming

RESEARCH INTERESTS

Deep Learning, Machine Learning, Artificial Intelligence, Speech Processing, Natural Language Processing, Dialog Systems, Multimodal Processing, Data Science.

WORK EXPERIENCE

Educational Testing Service (ETS) | Associate Research Engineer (Speech and NLP) — Feb 2017 – present
Dialog, Multimodal and Speech Research Center (DIAMONDS) — San Francisco, CA

- *Voice Biometrics*
- *Spoken Dialogue Systems*
- *Deep Learning for Automated Spoken Response Scoring*
- *Multimodal Scoring*
- *Native Language Identification*

Educational Testing Service (ETS) | Research Intern - NLP — Jun 2016 – Sep 2016
Dialog, Multimodal and Speech Research Center (DIAMONDS) — San Francisco, CA

- *Spoken Language Understanding for Conversational Dialogue Systems*

Speech Processing and Auditory Perception Lab (SPAPL) | Student Researcher — Jan 2016 – Dec 2016
University of California Los Angeles (UCLA) — Los Angeles, CA

- *Noise Robust Speaker Identification in limited training data environments*
- *Understanding and modeling kids' speech (M.S. Project - Fall 2016)*

HONORS & AWARDS

YFRSW Scholarship at Interspeech 2016 — Sep 2016
Workshop for Young Female Researchers in Speech Science & Technology — San Francisco, CA
Funded by NSF, Microsoft & Google.

- Scholarship recipient, selected to participate at the workshop for women undergraduate and masters students working in speech science and technology at the Interspeech 2016 conference in San Francisco (September 2016).

Pune Municipal Corporation Scholarship — 2009, 2011
Academic excellence in Higher Secondary Certificate and Secondary School Certificate examinations.

TECHNICAL SKILLS

- *Programming*: Python, R, MATLAB, C, C++, JavaScript, SQL, HTML, CSS
- *Tools*: Tensorflow, Keras, Kaldi, Apache Spark, WEKA, SKLL, NLTK, Gensim, OpenFace, Voicebox, VoiceSauce, CVX, VMware, MS Office
- *Hardware*: Atmel AVR, 80C51 Micro-controller, 89S51 Micro-controller
- *Operating Systems*: MS Windows, Linux, Mac OS

PUBLICATIONS

1. **R. Ubale**, Y. Qian, K. Evanini. "Exploring end-to-end attention-based neural networks for native language identification." in *Proceedings of the IEEE Workshop on Spoken Language Technology (SLT 2018)*.

2. Y. Qian, **R. Ubale**, M. Mulholland, K. Evanini, X. Wang. "A prompt-aware neural network approach to content-based scoring of non-native spontaneous speech." in *Proceedings of the IEEE Workshop on Spoken Language Technology (SLT 2018)*.

3. Y. Qian, **R. Ubale**, P. Lange, K. Evanini. "From Speech Signals to Semantics - Tagging Performance at Acoustic, Phonetic and Word Levels." in *Proceedings of the 11th International Symposium on Chinese Spoken Language Processing (ISCSLP 2018)*.

4. Z. Ni, **R. Ubale**, Y. Qian, M. Mandel, S. Yoon, A. Misra, D. Suendermann-Oeft. "Unusable Spoken Response Detection with BLSTM Neural Networks." in *Proceedings of the 11th International Symposium on Chinese Spoken Language Processing (ISCSLP 2018)*.
5. V. Ramanarayanan, D. Pautler, P. Lange, E. Tsuprun, **R. Ubale**, K. Evanini, and D. Suendermann-Oeft. "Toward Scalable Dialog Technology for Conversational Language Learning: A Case Study of the TOEFL® MOOC." in *Proceedings of Interspeech 2018*.
6. K. Evanini, M. Mulholland, **R. Ubale**, Y. Qian, R. Pugh, V. Ramanarayanan, and A. Cahill. "Improvements to an Automated Content Scoring System for Spoken CALL Responses: The ETS Submission to the Second Spoken CALL Shared Task." in *Proceedings of Interspeech 2018*.

7. C. W. Leong, L. Liu, **R. Ubale**, and L. Chen. "Toward large-scale automated scoring of scientific visual models." In *Proceedings of the Fifth Annual ACM Conference on Learning at Scale, 2018*.

8. Y. Qian, **R. Ubale**, V. Ramanarayanan, P. Lange, D. Suendermann-Oeft, K. Evanini, and E. Tsuprun, "Exploring ASR-free end-to-end modeling to improve spoken language understanding in a cloud-based dialog system," in *Proceedings of 2017 IEEE Workshop on Automatic Speech Recognition and Understanding (ASRU), Dec. 2017*.

9. Y. Qian, K. Evanini, P. L. Lange, R. A. Pugh, **R. Ubale**, F.K. Soong, "Improving native language (L1) identification with better VAD and TDNN trained separately on native and non-native English corpora," in *Proceedings of 2017 IEEE Workshop on Automatic Speech Recognition and Understanding (ASRU), Dec. 2017*.

10. Y. Qian, **R. Ubale**, V. Ramanarayanan, P.L. Lange, D. Suendermann-Oeft, K. Evanini and E. Tsuprun, "Towards End-to-End Modeling of Spoken Language Understanding in a Cloud-based Spoken Dialog System," in *Proceedings of SEMDIAL 2017 (SaarDial) Workshop on the Semantics and Pragmatics of Dialogue (pp. 160-161)*.

PROFESSIONAL ACTIVITIES

Reviewer for **North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT)**, 2019.

Reviewer for **IEEE Spoken Language Technology Workshop (SLT)**, 2018.

Reviewer for **Interspeech**, 2018.

TALKS AND PRESENTATIONS

Educational Testing Service Research | Intern Presenter — Sep 2016
Statistical framework for real time implementation of the Spoken Language Understanding component in the HALEF spoken dialog system

Interspeech 2016 | Workshop for Young Female Researchers in Speech Science & Technology — Sep 2016
Drunk-Text Detection

THESIS

Accent Correction System Based On Feedback Stimuli Generation — Jan 2014 – Apr 2015
Developed an accent correction system in which non-native English speaker's speech is corrected by identifying deviations in the person's current speech from the desired accent using PSOLA and Regression Analysis.
[Tools: MATLAB]

OPEN SOURCE CONTRIBUTIONS

halef-SETU - Python Package https://pypi.python.org/pypi/halef-SETU/
Statistical Engine for Text Understanding (SETU) https://sourceforge.net/p/halef/halef-SETU
halef-SETU provides an easy wrapper around SKLL models for statistical language understanding as well as an easy to use API based on Flask

SELECTED COURSE PROJECTS

Area function construction of children's /a/ vowel from 3D ultrasounds — Sep 2016 – Nov 2016

The goal of this project is to facilitate the understanding of children's production of the vowel /a/ through computation of area function - a measure that is representative of a speaker's vowel or consonant production through volumetric imaging.
[Tools: MATLAB]

Noise Robust Speaker Identification System May 2016 – Jun 2016
Built a system using cepstral features, normalization and filtering techniques to achieve robustness to noise conditions.
[Tools: MATLAB, VoiceBox, VoiceSauce]

Drunk-Text Detection Jan 2016 – Mar 2016
Given a Tweet, the goal is to identify if it was written under the influence of alcohol or not. Performed text-based analysis to determine level of inebriation. Multiclass Support Vector Machine (SVM) classifier is trained using stylistic, LDA and n-gram features to detect drunk tweets.
[Tools: Python, Scikit-learn, PyEnchant, NLTK, Tweepy, Re, Pandas, Numpy]

Acoustic correlates to speaker identity Feb 2016 – Mar 2016
Analyzed the performance of different acoustic features - formants, spectral slope parameters, voice source features, MFCC, LPC, LPCC and DTW using SVM and KNN classifiers for predicting perceptual dissimilarity for a pair of sounds and determining whether a pair of speech sounds are from the same speaker or not.
[Tools: MATLAB, VoiceSauce]

MISCELLANEOUS

Languages: English – Fluent, Marathi – Native proficiency, Hindi – Native proficiency, French – Basic proficiency (speak, read, write with basic competence), Spanish - Basic proficiency (speak, read, write with basic competence)