

# 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**

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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)