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.

WORK EXPERIENCE

Educational Testing Service (ETS) | Managing Senior Research Engineer — Feb 2022 – present
AI Research Labs — San Francisco, CA

- *Lead the speech research engineering team that builds backend AI capabilities to score spoken responses for ETS' TOEFL family of assessments as well as feedback and personalized learning capabilities for next-gen prototypes.*
- *Develop the vision for the Applied Spoken Language processing research and development of backend capabilities including automatic speech recognition and speech and natural language processing systems to automatically evaluate and provide feedback on spoken responses for English Language Learners.*
- *Work with UX research to identify learner needs and translate them to feedback features that can be powered by NLP and speech capabilities in language learning applications*
- *Lead the team to deliver, deploy and integrate the backend engine into prototype applications developed for language learners*

Educational Testing Service (ETS) | Research Engineer — Mar 2020 – Jan 2022
AI Research Labs — San Francisco, CA

- *Lead the research and development of backend capabilities including automatic speech recognition and speech and natural language processing systems to automatically evaluate and provide feedback on spoken responses for English Language Learners.*
- *Work with UX research to identify learner needs and translate them to feedback features that can be powered by NLP and speech capabilities in language learning applications*
- *Work with front-end deliver, deploy and integrate the backend engine into prototype applications developed for language learners*

Educational Testing Service (ETS) | Research Engineer (Speech and NLP) — Nov 2019 – Feb 2020
Dialog, Multimodal and Speech Research Center (DIAMONDS) — San Francisco, CA

- *Led research and engineering for the development of ETS' in-house speaker recognition system*
- *Worked on improvements to streaming ASR infrastructure, ASR confidence model, research and development of speaking feedback components for English Language Learners and deep learning models for automated spoken response scoring*
- *Collaborated with research scientists on research studies resulting in 18 publications at conferences such as ASRU, ICASSP, SLT, ACL and INTERSPEECH.*

Educational Testing Service (ETS) | Associate Research Engineer (Speech and NLP) — Feb 2017 – Oct 2019
Dialog, Multimodal and Speech Research Center (DIAMONDS) — San Francisco, CA

- *Main engineer tasked with the development of ETS' in-house voice biometrics capability.)*
- *Designed, implemented and evaluated speech, natural language and image processing systems for speaker recognition, spoken dialog systems, spoken language understanding, native language identification and multimodal scoring.*

Educational Testing Service (ETS) | Natural Language Processing Consultant — Jun 2016 – Sep 2016
Dialog, Multimodal and Speech Research Center (DIAMONDS) — San Francisco, CA

- *Spoken Language Understanding for Conversational Dialogue Systems*

HONORS & AWARDS

ETS SPOT Award — Sep 2021
For leading the research and development of a light-weight backend engine that generates automated speech feedback in record timeline to power the front-end of a language learning prototype application.

ETS SPOT Award — Jul 2021
For achieving a major milestone in the development of in-house speech capabilities through research and development of faster and more accurate speech recognition system.

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, Bash
- *Tools*: Tensorflow, Keras, Kaldi, Apache Spark, WEKA, SKLL, NLTK, Gensim, OpenFace, Voicebox, VoiceSauce, CVX, VMware, MS Office
- *Operating Systems*: MS Windows, Linux, Mac OS

MAGAZINE FEATURES

"The 2022 State of Speech Engines," **Speech Technology Magazine**, Information Today, Inc. Publishing, February 2022.

PUBLICATIONS

1. Y. Qian, **R. Ubale**, P. Lange, K. Evanini. F. Soong, "Spoken Language Understanding of Human-Machine Conversations for Language Learning Applications." in *Journal of Signal Processing Systems 92, no. 8 (2020): 805-817.*
2. C. W. Leong, B. B. Klebanov, C. Hamill, E. Stemle, **R. Ubale**, and X. Chen. "A report on the 2020 VUA and TOEFL metaphor detection shared task." in *Proceedings of the Second Workshop on Figurative Language Processing, pp. 18-29. Jul. 2020.*
3. **R. Ubale**, V. Ramanarayanan, Y. Qian, K. Evanini, C. W. Leong, C. M. Lee. "Native language identification from raw waveforms using deep convolutional neural networks with attentive pooling." in *Proceedings of 2019 IEEE Workshop on Automatic Speech Recognition and Understanding (ASRU), Dec. 2019. IEEE.*
4. C. W. Leong, K. Roohr, V. Ramanarayanan, M. P. Martin-Raugh, H. Kell, **R. Ubale**, Y. Qian, Z. Mladineo, and L. McCulla. "To Trust, or Not to Trust? A Study of Human Bias in Automated Video Interview Assessments." in *(to appear) Workshop on Interpreting and Explaining Visual Artificial Intelligence Models, International Conference on Computer Vision (ICCV 2019), Nov. 2019. IEEE.*
5. C. W. Leong, K. Roohr, V. Ramanarayanan, M. P. Martin-Raugh, H. Kell, **R. Ubale**, Y. Qian, Z. Mladineo, and L. McCulla. "Are Humans Biased in Assessment of Video Interviews?" in *Adjunct of the 2019 International Conference on Multimodal Interaction (ICMI '19). ACM, New York, NY, USA, Article 9, 5 pages.*
6. Y. Qian, P. Lange, K. Evanini, R. Pugh, **R. Ubale**, M. Mulholland, and X. Wang. "Neural approaches to automated speech scoring of monologue and dialogue responses." in *Proceedings of The 44th IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2019. IEEE.*
7. **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), pp. 84-91, 2018. IEEE.*
8. 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), pp. 979-986, 2018. IEEE.*

9. 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), 2018. IEEE.*

10. 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), 2018. IEEE.*

11. 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, pp. 1960-1961, 2018.*

12. 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, pp. 2379-238, 2018.*

13. 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.*

14. 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. IEEE.*

15. 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. IEEE.*

16. 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).*

PATENTS

US Patent # 11,455,488, *"Platform for automated scoring of scientific visual models"*, C. W. Leong, L. Liu, **R. Ubale**, and L. Chen (issued 9/27/2022).

U.S. Patent # 11,222,627, *"Exploring ASR-free end-to-end modeling to improve spoken language understanding in a cloud-based dialog system"*, Y. Qian, **R. Ubale**, V. Ramanarayanan, P. Lange, D. Suendermann-Oeft, K. Evanini, and E. Tsuprun (issued 1/11/2022).

U.S. Patent # 10,783,873, *"Native Language Identification with Time Delay Deep Neural Networks trained separately on native and non-native English corpora"*, Y. Qian, K. Evanini, P. L. Lange, R. A. Pugh, **R. Ubale** (issued 9/22/2020).

PROFESSIONAL SERVICES AND LEADERSHIP

Workshop Organization:

1. Organizer (Chair) **Women in AI Summit, ETS Canada Inc**. On behalf of ETS Canada organized, a free virtual summit organized to share and promote the work that the AI teams at ETS do, and to engage and provide mentoring opportunities to Canadian women, students, and early professionals working in the field of AI.
2. Organizer of **The Second Shared Task on Metaphor Detection** in *the Second Workshop on Figurative Language Processing, Association for Computational Linguistics, 2020.*

Scientific/Program/Technical Committees:

1. Journal Reviewer for **Knowledge-Based Systems, Elsevier Journal**, 2021 - present.
2. Reviewer for **Association for Computational Linguistics (ACL) Rolling Review**, 2021 - present.
3. Reviewer for **Association for Computational Linguistics**, 2019 - 2020.
4. Reviewer for **Empirical Methods in Natural Language Processing**, 2020 - present.
5. Reviewer for **North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT)**, 2019 - present.

6. Reviewer for **IEEE Spoken Language Technology Workshop (SLT)**, 2018.
7. Reviewer for **Interspeech**, 2018.
8. Reviewer for **20th ACM International Conference on Multimodal Interaction (ICMI)**, 2018-2020.

Mentoring:

1. **UCLA WATT Undergraduate Mentor, 2020-present**. *Mentoring undergraduate Electrical Engineering female students who are considering a career in research and industry.*

TALKS AND PRESENTATIONS

Advancing Assessment and Evaluation Virtual Conference | Invited Panelist Jan 2022
Panel Speaker invited to speak on the theme, "Advancing Assessment and Evaluation to Promote Language Learning". Presented a talk on AI Assisted Spoken Language Learning for mobile and computer applications.

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

OPEN SOURCE CONTRIBUTIONS

Vosk API - Offline Speech recognition toolkit https://github.com/alphacep/vosk-api
As an external contributor, added new features to results generated from the speech recognizer that would benefit the speech processing community

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

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)