

Laxmi Pandey

Email: lpandey@ucmerced.edu

GitHub: <https://github.com/laxmipp>

ACADEMIC DETAILS

Examination	Institute	Year	GPA
Ph.D. (Computer Science)	University of California Merced	2018 - Present	4.0
M.S. (Electrical Engineering)	Indian Institute of Technology Kanpur	2015 - 2017	3.5
B.Tech (Electrical Engineering)	Uttar Pradesh Technical University Lucknow	2008 - 2012	3.5

FIELDS OF INTEREST

Human-Computer Interaction, Language Processing, Audio-Visual Speech Recognition, Deep Learning

PUBLICATIONS

1. Laxmi Pandey, Ahmed Sabbir Arif "**LipType: A Silent Speech Recognizer Augmented with an Independent Repair Model**", CHI Conference on Human Factors in Computing Systems, CHI 2021. [Under review]
2. Laxmi Pandey, Khalad Hasan, Ahmed Sabbir Arif "**Acceptability of Speech and Silent Speech Input Methods in Private and Public**", CHI Conference on Human Factors in Computing Systems, CHI 2021. [Under review]
3. Laxmi Pandey, Ahmed Sabbir Arif "**Listening Not Required: Speech Recognition from Vocal Tract Shape Dynamics in Real-Time MRI**", 18th ACM International Conference on Mobile and Ubiquitous Multimedia, MUM 2020. [Under review]
4. Laxmi Pandey, Ahmed Sabbir Arif "**Enabling Text Translation Using the Suggestion Bar of a Virtual Keyboard**", IEEE International Conference on Systems, Man, and Cybernetics, SMC 2020.
5. Laxmi Pandey, Azar Alizadeh, Ahmed Sabbir Arif "**Enabling Predictive Number Entry and Editing on Touchscreen-Based Mobile Devices**", ACM Conference on Human Information Interaction and Retrieval, CHIIR 2020.
6. Steven J. Castellucci, I. Scott MacKenzie, Mudit Misra, Laxmi Pandey, Ahmed Sabbir Arif "**TiltWriter: Design and Evaluation of a No-touch Tilt-based Text Entry Method for Handheld Devices**", ACM International Conference on Mobile and Ubiquitous Multimedia, MUM 2019. .
7. Laxmi Pandey, Ahmed Sabbir Arif "**Context-Sensitive App Prediction on the Suggestion Bar of a Mobile Keyboard**", ACM International Conference on Mobile and Ubiquitous Multimedia, MUM 2019.
8. Aditya Raikar , Saurya Basu, Laxmi Pandey, Rajesh M. Hegde "**Multi-Channel Joint speech dereverberation and denoising using Deep Priors**", IEEE India Council International Conference, INDICON 2018.
9. Laxmi Pandey, Karan Nathwani "**LSTM Based Attentive Fusion of Spectral and Prosodic Information for Keyword Spotting**", Interspeech 2018.
10. Laxmi Pandey, Anurendra Kumar, Vinay Namboodiri "**Monaural Audio Source Separation Using Variational Autoencoders**" , Interspeech 2018.
11. Laxmi Pandey, Nitish Divakar, Krishna D N, Anuroop Iyengar "**Deep Clean: GPU Powered Speech Denoising using Adversarial Learning**" , NVIDIA's GPU Technology Conference, GTC 2018.
12. Laxmi Pandey, Rajesh M. Hegde "**Keyword Spotting in Continuous Speech using Spectral and Prosodic Information Fusion**", Circuits Systems and Signal Processing, CSSP Springer, 2018. [Journal]
13. Laxmi Pandey, Kuldeep Chaudhary, Rajesh M. Hegde "**Fusion of Spectral and Prosodic Information using Combined Error Optimization for Keyword Spotting**", IEEE National Conference on Communications, NCC 2017.
14. L. Pandey, K. Nathwani, S. Kaur, I. Hussain, R. Pathak, G. Singh, S. Tiwari, Rajesh M. Hegde "**Domain Specific Audio Indexing Using Linguistic Information**", IEEE Symposium on Signal Processing and Information Technology, ISSPIT 2014.

SCHOLARSHIPS

1. Hatano Cognitive Development Research Fellowship, 2020, \$1000.
2. SIGIR Student Travel Grant, 2020, \$1000.
3. ACM-W Scholarship Award for Attendance at Research Conferences, 2020, \$600.
4. Summer EECS Bobcat Fellowship at UC Merced, 2019, \$4200.
5. International Speech Communication Association (ISCA) Travel Grant, 2018, € 650.

PROFESSIONAL MEMBERSHIPS AND SERVICES

1. Member, Institute of Electrical and Electronics Engineers (IEEE).
2. Member, Association for Computing Machinery (ACM).
3. Reviewed papers for ACM International Symposium on Wearable Computers (ISWC) 2020.
4. Reviewed papers for ACM International Conference on Intelligent User Interfaces (IUI) 2019.

PRESENTATIONS AND WORKSHOPS

1. Presented a work "*Enabling Predictive Number Entry and Editing on Touchscreen-Based Mobile Devices*", at Conference on Human Information Interaction and Retrieval (CHIIR) 2020, Vancouver, Canada.
2. Presented a work "*Novel Eyes-Free Text Entry Techniques for Mobile Devices*", at the 2nd Annual Fall Symposium: Branches of Cognitive Science, Cognitive Science Student Association, University of California, Merced, USA,
3. Participated in SIGCHI Summer School on *Research Methods and Approaches to Text Entry and Other Interaction Techniques*, May 21 - 25, 2018, IIT Bombay, India.
4. Presented a work *Fusion of Spectral and Prosodic Information using Combined Error Optimization for Keyword Spotting*, at IEEE National Conference on Communications (NCC) 2017, IIT Madras, India.
5. Participated in *Workshop on Image and Speech Processing (WISP)*, Dec 8 - 12, 2012, IIT Hyderabad , India.

RESEARCH AND ACADEMIC PROJECTS

1. **Design and Development of lip reading assistive technology for human-computer interaction** (*Ongoing*), UC Merced, [Advisor: Dr. Ahmed Ariff]: Developing a technique that offers users an opportunity to use the camera to "actively" input text on the mobile devices. It repurposes the mobile device's front camera to capture the user's facial recordings, segments silently speaking lip sequences and classifies them into text using a vision-based approach.
2. **Fusion of Spectral and Prosodic Information for Keyword Spotting in Continuous Speech** (*July 2016 - July 2017*), Master's Thesis, IIT Kanpur [Advisor: Prof. Rajesh Hegde]: Developed a methodology for information fusion of prosodic and spectral information in the syllabic search space at model level and feature level to improve Automatic Speech Recognition (ASR) performance.
3. **Build and demonstrate a real time continuous speech recognition system for Hindi language** (*Jan 2016 - Apr 2016*), Course project for EE627, Speech Signal processing, IIT Kanpur, [Advisor: Prof. Rajesh Hegde]: Developed and demonstrated a system for spotting keywords in continuous speech utterances using word boundary identification and language modeling.
4. **Development of Prosodically Guided Phonetic Engine for Hindi** (*July 2012 - Dec 2014*), IIT Kanpur, [Advisor: Prof. Rajesh Hegde]: Developed a phonetic engine using prosodic and phonetic information for Hindi language. To demonstrate this work, a telephone based audio indexing system for searching through audio archive in Hindi is developed.
5. **License Plate Detection and Recognition in Complex Scenes Using Mathematical Morphology and Support Vector Machines** (*Aug 2015 - Nov 2015*), Term Paper for EE604, Image Signal processing : Developed a highly reliable license plate detection and recognition approach using mathematical morphology and support vector machines (SVM).

INDUSTRIAL COLLABORATION

1. **Real Time Goal Detection in Soccer Match using Hidden Markov Model** (Feb 2016 - Oct 2016), LG Soft India: Developed a real time goal detection tool that will generate an automatic cheering effects at every goal hits in the soccer match video.
2. **Development of SMS Compression Techniques for Indian Languages** (Sept 2015 - Jan 2016), CDAC India: Developed a standard loss less compression algorithm that can allow more number of characters of Hindi language in SMS text. The encoding schemes allow the transmission of around 160 characters for pure Hindi, and multilingual text.
3. **Video Analyzer using Command Line Video Quality Metric** (March 2015 - Feb 2016), LG Soft India: Designed and developed a video analyzer tool which is used for scoring the similarity or difference between two videos on the basis of dropped frames, broken macro blocks, etc.
4. **Audio Analyzer using Dynamic Time Warping Algorithm** (Jan 2014 - Feb 2015), LG Soft India: Designed and developed an audio analyzer tool which is used for scoring the similarity and difference in audio effects between reference and test device.
5. **Digital Mandi for the Indian Kissan** (July 2012 - Mar 2013), BSNL India: Digital Mandi Application for Indian Kisan is a unique web and cell phone based multimodal agriculture commodity price retrieval system. It has been developed by BITCOE (BSNL IIT-Kanpur Centre of Excellence) at IIT-Kanpur. Currently, the application has been deployed on the BSNL national network in Orissa and Haryana. The application service was formally inaugurated by Honorable Minister of Communications and IT on 29th August 2011 and is operational since then.

WORK EXPERIENCE (4+ years)

1. Graduate Teaching Assistant at UC Merced - California, USA, (Aug 2018 - May 2020)
 - CSE-005: Introduction to Computer Applications.
2. Worked as a Research Engineer at Cogknit Semantics - IISC Bangalore, India, (Oct 2017 - Mar 2018)
 - Non Speech sequence Labeling, Speaker Verification, Out-of-vocabulary Words Detection Silence detection and Speech Denoising.
 - Developed an automatic speech recognition models for Indian languages using Kaldi toolkit.
3. Worked as a Research Associate at MIPS Lab, IIT Kanpur, India (July 2012 - July 2015)
 - Developed an automatic speech recognition systems using sphinx3 toolkit .
 - Developed a voice enabled radio news access system using spoken query with database handling using PHP and MySQL.
 - Developed a speech based search engine to search a spoken keyword with in an audio archive for the retrieval of keyword related information.
 - Developed a tool for real time goal detection tool for automatic generation of cheer sound effects at every goal hit in the soccer match.
 - Designed audio and video analyzing tools, scoring the similarity and difference between their contents.

RELEVANT COURSES

Statistical Signal Processing, Speech Signal Processing, Image Signal Processing, Introduction to Signal Analysis, Digital Signal Processing, Human-Computer Interaction, Computer Animation, Photonics, Networks and Switching.

REFERENCES

1. Prof. Ahmed Arif [**Ph.D. Advisor**] - asarif@ucmerced.edu
Professor, Electrical and Computer Science Engineering, UC Merced, USA
2. Prof. Rajesh M. Hegde [**M.S. Advisor**] - rhegde@iitk.ac.in
Professor, Electrical Engineering, IIT Kanpur, India
3. Prof. Marcelo Kallmann [**Course Instructor**] - mkallmann@ucmerced.edu
Professor, Electrical and Computer Science Engineering, UC Merced, USA
4. Prof. Vinay Namboodri [**Course Instructor**] - vinaypn@iitk.ac.in
Professor, Computer Science and Engineering, IIT Kanpur, India