KOMATH NAVEEN KUMAR

Office Address
Sony Interactive Entertainment LLC.,
2207 Bridgepoint Pkwy.
San Mateo, CA 94404

naveen1.kumar@sony.com
knaveen87@gmail.com
Cell : (213) 545-1684

Interests

- Machine learning for speech, multimedia and multimodal processing

Current

- **Sony Interactive Entertainment America** Sept 2016-present
  Sr. Software Engineer,
  SIE R&D, San Mateo, CA, USA

Education

- **University of Southern California, Los Angeles, CA** Aug 2009- Aug 2016
  Ph.D. in Electrical Engineering
  Signal Analysis and Interpretation Laboratory
  Thesis: *Exploiting latent reliability information for classification tasks*
  GPA: 3.91/4.0
- **Indian Institute of Technology, Kharagpur, India** May 2009
  B.Tech. in Electrical Engineering
  GPA: 8.5/10.0

Experience at SIE R&D

- **Affective computing**
  Emotion recognition from speech and facial expression.
- **Text-to-speech synthesis**
  Parametric and concatenative synthesis methods to generate different synthetic voices.
- **Speech-to-text recognition**
  Acoustic models for noisy and far field speech recognition.

Projects at SAIL, USC

- **Multimedia Content Analysis (Google/GDI)**
  Methods for automatic analysis of gender bias in movies from video, audio and text modalities. An important challenge is making standard audio/ video algorithms such as diarization robust on movies.
- **Underwater Acoustics (ONR/NSF)**
  Initial phase of the project involved tasks related to classification and detection of objects in underwater sonar images. Currently, working on joint optimization of communication and navigation tradeoffs while performing localization tasks underwater.
- **Development of open source speech toolkit (multiple projects)**
  Implemented different denoising algorithms for use within the framework of KALDI speech recognition toolkit. I also experimented with fusion of diverse denoising systems to provide robustness to noise conditions. Currently working on an online diarization algorithm for use with KALDI.
- **Dynamics of vocal tract shaping (NIH)**
  Image processing techniques for robust segmentation and extraction of landmark points from realtime MR images of the human vocal tract.
- **Be a Scientist: Informal science education (NSF)**
  Informal science learning programs are provided by our NGO partner *Iridescent*. I am working on methods for automatic analysis of instruction quality using classroom video in order to provide feedback to the instructors on their teaching.

Peer-Reviewed Journal Papers

1. Krishna Somandepalli, **Naveen Kumar**, Tanaya Guha, Shrikanth S. Narayanan, *"Unsupervised Discovery of Character Dictionaries in Animation Movies"*, IEEE Transactions on Multimedia.
2. **Naveen Kumar**, Fatemeh Fazel, Milica Stojanovic, Shrikanth S. Narayanan, *"Online rate adjustment for adaptive random access compressed sensing of time-varying fields"*, EURASIP Journal on Advances in Signal Processing.
3. **Naveen Kumar**, Urbashi Mitra, Shrikanth S. Narayanan, *"Robust object classification in underwater sidescan sonar images by using reliability aware fusion of shadow features"*, IEEE Journal of Oceanic Engineering.
4. Jangwon Kim, **Naveen Kumar**, Andreas Tsiartas, Ming Li, Shrikanth S. Narayanan, *"Automatic Intelligibility Classification of sentence-level pathological speech"*, Computer Speech and Language : Special Issue on next generation paralinguistics .

Workshops/ Abstracts

1. **Naveen Kumar**, Shrikanth S. Narayanan, *"Detection of Musical Event Drop from Crowdsourced Annotations using a Noisy Channel Model"*, Proc., MediaEval Workshop, 2014
2. **Naveen Kumar**, Rahul Gupta, Tanaya Guha, Colin Vaz, Maarten V. Segbroeck, Jangwon Kim, Shrikanth S. Narayanan *"Affective Feature Design and Predicting Continuous Affective Dimensions from Music"*, Proc., MediaEval Workshop, 2014
3. Sunav Choudhary, D. Kartik, **Naveen Kumar**, Urbashi Mitra, Shrikanth S. Narayanan, *"Active Target Detection with Navigation Costs : A Randomized Benchmark"*, Proc. Allerton 2014.
4. Vikram Ramanarayanan, **Naveen Kumar**, Shrikanth S. Narayanan, *"A framework for unusual event detection in videos of informal classroom settings"*, Workshop on Personalizing Education with Machine Learning, NIPS 2012.

Peer-Reviewed Conference Papers

1. Ankit Goyal, **Naveen Kumar**, Tanaya Guha, Shrikanth S. Narayanan, *"A multimodal mixture-of-experts model for dynamic emotion prediction in movies"*, Accepted at ICASSP 2016.
2. Adarsh Tadimari, **Naveen Kumar**, Tanaya Guha, Shrikanth S. Narayanan, *"Opening big in Box Office? Trailer content can help"*, Accepted at ICASSP 2016.
3. Rahul Gupta, Theodora Chaspari, Jangwon Kim , **Naveen Kumar**, Danny Bone, Shrikanth S. Narayanan, *"Pathological speech processing: state-of-the-art, current challenges, and future directions"*, Accepted at ICASSP 2016.
4. Tanaya Guha, Chewei Huang, **Naveen Kumar**, Zhu Yan, Shrikanth S. Narayanan, *"Gender Representation in Cinematic Content: A Multimodal Approach"*, Accepted at ICMI 2015.
5. **Naveen Kumar**, Shrikanth S. Narayanan, *"A discriminative reliability-aware classification model with applications to intelligibility classification in pathological speech"*, Accepted at Interspeech 2015.
6. Rahul Gupta, **Naveen Kumar**, Shrikanth S. Narayanan, *"Affect prediction in music using boosted ensemble of filters"*, Accepted at EUSIPCO 2015.
7. Tanaya Guha, **Naveen Kumar**, Shrikanth S. Narayanan, Stacy Smith, *"Computationally deconstructing movie narratives"*, Accepted at ICASSP 2015 .
8. Jangwon Kim, **Naveen Kumar**, Sungbok Lee, Shrikanth S. Narayanan, *"Enhanced airway-tissue boundary segmentation for real-time magnetic resonance imaging data"*, Proc. ISSP 2014.

9. **Naveen Kumar**, Shrikanth S. Narayanan, *"Hull Detection Based on Largest Empty Sector Angle with application to analysis of real-time MR images"*, Accepted at ICASSP 2014.
10. **Naveen Kumar**, Maarten Van Segbroeck, Kartik Audhkhasi, Peter Drotar, Shrikanth S. Narayanan, *"Fusion of diverse denoising systems for Robust Automatic Speech Recognition"*, Accepted at ICASSP 2014.
11. Sunav Choudhary, **Naveen Kumar**, Urbashi Mitra, Shrikanth S. Narayanan, *"Active Target Detection with Mobile Agents"*, Accepted at ICASSP 2014.
12. Jangwon Kim, **Naveen Kumar**, Andreas Tsiartas, Ming Li , Shrikanth S. Narayanan, *"Intelligibility Classification of Pathological Speech using Fusion of Multiple Subsystems"*,Proc. Interspeech 2012.
13. **Naveen Kumar**, Andreas Tsiartas, Shrikanth S. Narayanan, *"Features for comparing tune similarity of songs across different languages"*, Proc. MMSP 2012.
14. **Naveen Kumar**, Qun Feng Tan, Shrikanth S. Narayanan, *"Object Classification in Sidescan Sonar Images with Sparse Representation Techniques"*, Proc. ICASSP 2012.
15. **Naveen Kumar**, Adam Lammert, Brendan Englot, Frank S. Hover, Shrikanth S. Narayanan, *"Directional Descriptors using Zernike Moment Phases for Object Orientation Estimation in Underwater Sonar Images"*, Proc. ICASSP 2011.

Graduate Courses

Probability	Wavelets	Pattern Recognition
Statistics	Speech Recognition	Machine Learning
Random Processes	Computer Vision	Graphical Models
Convex Optimization	Natural Language Processing	

Skills

Programming: Python, Java, C/C++, Bash, MATLAB
Tools: SPSS, LaTeX, OpenFST, Git, SVN
Speech Tools: KALDI, HTK, Eesen, Festival
ML Tools: Keras, Tensorflow, PyTorch, sklearn, weka, scipy
OS: Unix, Windows

Awards

- Awarded Merit-Cum-Means scholarships for two succesive years at IIT Kharagpur.
- Awarded InfoUSA Summer Research Fellowship 2008 for an internship at USC.
- Won Interspeech 2012 Computational Paralinguistic Challenge for Intelligibility Classification of Pathological Speech
- Northern Digital Inc. Excellence award at ISSP 2014, Cologne, Germany for MRI segmentation paper.

Professional Activities

- Reviewed papers for SPCOM, ICASSP, Transactions of Affective Computing and IEEE Journal of Oceanic Engineering
- Member of IEEE, SPS and ISCA