Vibha Viswanathan

Curriculum Vitae

Ruth L. Kirschstein Graduate Fellow
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Education

2016 –	[Ph.D.]	Purdue University, West Lafayette	Biomedical Engineering
2006 – 2007	M.S.	University of Michigan, Ann Arbor	Electrical Engineering: Systems
2002 – 2006	B.E.	Anna University, India	Electronics and Communication Engineering

Professional Experience

2017 – NIH Predoctoral Fellow, Auditory Neurophysiology & Modeling Lab, Purdue University, West Lafayette, IN
Mentor: Michael Heinz, Co-mentor: Barbara Shinn-Cunningham (Carnegie Mellon University)
Studying neural coding of speech in noise and speech intelligibility modeling using a combination of computational modeling, electroencephalography (EEG), and behavioral experiments.

2016 – 2017 Graduate Student Researcher, CONNplexity Lab, Purdue University, West Lafayette, IN
Mentor: Joaquín Goñi
Developed fMRI-based graph statistical methods to detect temporal changes in the functional connectivity between brain regions during resting state and task conditions.

2015 – 2016 Research Fellow, Auditory Neuroscience Lab, Center for Computational Neuroscience and Neural Technology, Boston University, Boston, MA
Mentor: Barbara Shinn-Cunningham
Investigated the neural mechanisms of selective attention to speech in noise using EEG and graph theoretic approaches.

2011 – 2015 MATLAB Math Quality Engineer, MathWorks, Natick, MA
Wrote test suites for and helped design core MATLAB mathematical algorithms (with MATLAB and C++). Classes of MATLAB functions covered include: linear algebra, signal processing, random number distributions, differential equation solvers, computational geometry, and graph/network algorithms.

2008 – 2011 Engineer, Engineering Development Group, MathWorks, Natick, MA
Developed MATLAB tools for image/audio processing (e.g., automatic multimodal (MR and CT) 3D image registration, edge/corner detection, and fixed-point DSP audio codecs). Provided application support for toolboxes in the areas of Signal/Image Processing, Mathematics, and Statistics.

Membership

2020 –	Member, Acoustical Society of America
2019 –	Member, Society for Neuroscience
2015 –	Member, Association for Research in Otolaryngology

Awards and Honors

2019	Acoustical Society of America Conference Travel Award and **Invited Talk**
2018 – 2021	Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral Fellowship (*F31*), National Institutes of Health (NIH)
2016 – 2017	Lynn Fellowship, Purdue University
2016	Travel Scholarship, ACNN Workshop on Big Neuroscience Data, Tools, Protocols & Services
2015	Travel Award, Center for Computational Neuroscience and Neural Technology, Boston University
2006	"First class with distinction" in Bachelor of Engineering, Anna University

Teaching

2020	Guest Instructor, Weldon School of Biomedical Engineering, Purdue University **BME 595: Biomedical Signal Processing** (Fall 2020) Developed course content and delivered four lectures on Linear Algebraic Methods for Signal Processing
2017	Graduate Teaching Assistant, Weldon School of Biomedical Engineering, Purdue University **BME 305: Bioinstrumentation Circuit and Measurement Principles** (Fall 2017)

Mentoring Experience

2020	Luis Fernando Aguilera de Alba (Undergraduate Researcher, Purdue University SURF Program)

Publications

Journal Articles

[J1] **Viswanathan, V.**, Bharadwaj, H. M., & Shinn-Cunningham, B. G. (2019). Electroencephalographic signatures of the neural representation of speech during selective attention. *eNeuro*, ENEURO-0057.

Conference Proceedings

[C1] Gopi, E. S., **Viswanathan, V.**, Sankaralingham, P., & Ramakumar, S. (2005). A new approach to create high level features from low level features of audio clips. Proceedings of IEEE International Conference on Communications, Circuits and Systems.

Forthcoming Manuscripts

[F1] **Viswanathan, V.**, Bharadwaj, H. M., Shinn-Cunningham, B. G., & Heinz, M. G. (Under Review). Neural envelope coding depends on multiple factors and predicts speech intelligibility across diverse listening conditions.

Conference Abstracts/Presentations

[A1] Mok, B. A., **Viswanathan, V.**, Borjigin, A., Singh, R., & Bharadwaj, H. M. (2020). *Anonymous Multipart Web-based Psychoacoustics: Infrastructure, Hearing Screening, and Comparison with Lab-based Studies.* Acoustics Virtually Everywhere, 179th Meeting of the Acoustical Society of America, 7–11 Dec.

[A2] **Viswanathan, V.**, Bharadwaj, H. M., & Shinn-Cunningham, B. G. (2020). *Attentional Modulation of the Neural Representation of Speech: Spectral Profile and Individual Differences.* Mid-Winter Meeting of the Association for Research in Otolaryngology, San Jose, CA, 25–29 Jan.

[A3] **Viswanathan, V.**, Bharadwaj, H. M., Shinn-Cunningham, B. G., & Heinz, M. G. (2019). *Evaluating Human Neural Envelope Coding as the Basis of Speech Intelligibility in Noise.* The Journal of the Acoustical Society of America, 145(3), 1717-1717.

[A4] **Viswanathan, V.**, Bharadwaj, H. M., Shinn-Cunningham, B. G., & Heinz, M. G. (2019). *Neurophysiological Validation of Envelope-based Models of Speech Intelligibility.* Mid-Winter Meeting of the Association for Research in Otolaryngology, Baltimore, MD, 8–13 Feb.

[A5] **Viswanathan, V.**, Dzemidzic, M., Kareken, D., & Goñi, J. (2017). *Dynamic multivariate kurtosis as a measure of temporal variations in task-rest functional connectivity.* NetSci, Indianapolis, IN, 19–23 June.

[A6] **Viswanathan, V.**, Dzemidzic, M., Kareken, D., & Goñi, J. (2017). *Dynamic multivariate kurtosis as a measure of temporal variations in task-rest functional connectivity, with applications to family history of alcoholism.* Society for Neuroscience, Greater Indiana Chapter, IN, Indiana, 31 March.

[A7] **Viswanathan, V.**, Bharadwaj, H. M., & Shinn-Cunningham, B. G. (2016). *Neural signatures of speech-on-speech selective attention.* Mid-Winter Meeting of the Association for Research in Otolaryngology, San Diego, CA, 20–24 February.