Shihab Shamma

Education

Ph.D. Electrical Engineering, Stanford University, 1980
M.S. Electrical Engineering, Stanford University, 1977
M.A. Slavic Languages and Literature, Stanford University, 1980
B.Sc. Electrical Engineering, Imperial College, London, U.K., 1976

Principal Appointments

July 1995 - present	Professor of Electrical and Computer Engineering, Department of Electrical and Computer Engineering, University of Maryland, College Park
July 1990 - present	Joint Appointment, Institute for Systems Research, University of Maryland, College Park
Aug. 1989 - July 1995	Associate Professor of Electrical Engineering, Department of Electrical Engineering, University of Maryland
June 1987- May 1992	Joint appointment with Institute for Advanced Computer Studies, University of Maryland College Park
Aug. 1984 - Aug. 1989	Assistant Professor of Electrical Engineering, Department of Electrical Engineering, University of Maryland
Sept. 1983 - Aug. 1984	Staff Fellow, Mathematical Research Branch, NIADDK, National Institutes of Health
Oct. 1981 - Aug. 1983	Post-doctoral research in auditory physiology, Section on Brain and Behavior, NICHD, National Institutes of Health
Aug. 1980 - June 1981	Research Associate, Department of Electrical Engineering, Stanford University

Refereed Publications

J1. May G., S. Shamma, and R. White, “A Tantalum-on-Saphire Microelectrode Array”, *IEEE Trans. on Electron Dev*., ED-26 (12), 1932-1939, 1979.

J2. Shamma S., G. May, N. Cotter, R. White, and F. Simmons, “Thin-film Microelectrode Arrays for a Cochlear Prosthesis”, *IEEE Trans. Electron Dev.,* ED-29 (1), 136-144, 1982.

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Ph.D. Theses Directed

1. Xiang Yang (Aug. 1989), "Detection and Classification of Neural Signals and Identification of Neural Networks".
2. Anthony Teolis, (June 1993) "Discrete Representation of Signals from Infinite Dimensional Hilbert Spaces with Applications to Noise Suppression and Compression
3. Daniel Lin, (June 1993), "VLSI Implementation of the Early Auditory Processing".
4. William Byrne, (Dec. 1993), "The Analysis of Nonlinear Networks for Continuous Word Generation and Recognition".
5. Svetlana Vranic, (Dec. 1993), "Modelling Perception of Spectral Profile Changes".
6. Kwansan Wang, (June 1994), "Mathematical Models of Sound Representation in the Auditory System".
7. Nina Kowalski, (June 1996), "Encoding of Sound in the Anterior Auditory Field of the Auditory Cortex".
8. Timothy Owens, (June 1997), "Evoked Potential Maps in the Primary Auditory Cortex".
9. Powen Ru, (Dec 1999), ``Cortical Representations and Speech Recognition".
10. Nikolas Kanlis (Dec 2002), "Independent Component Analysis of Evoked Potential Maps in Auditory Cortex".
11. Tai Chi (May 2004), "Reconstruction of Speech from Dynamic Cortical Representation".
12. Mounya ElHilali (Dec. 2004), "Nonlinear Spectrotemporal Analysis of Cortical Responses "
13. Nima Masgarani (Dec. 2008), "Representation of Speech in the Auditory Cortex".
14. Serin Atiani, (May. 2010), "Plasticity in the secondary auditory cortex (PEG)"
15. Ling Ma, (May 2011), "The role of attention in streaming".
16. Kevin Donaldson (May 2015), "Prefrontal Cortical processing in mouse".
17. Majid Mirbagheri (Dec.2014) " Speech enhancement and Speaker Identification".
18. Sahar Akram (Dec 2014) "Sound streaming in the auditory cortex".
19. Lakshmi Krishnan (May. 2016) "Computational auditory scene analysis".
20. Diego Delguedo (Dec. 2016) "Role of Prefrontal cortex in rapid plasticity".

21. Neha Joshi (June 2020) “Neural bases of sound segmentation”

Post-Doctoral Fellows

J. Fleshman (1985-1989); X. Yang (1989-1993); H. Versnel (1992-1995); P. Ru (1996-1997); S. Vranic (1994); K. Wang (1994-1997); J. Lin (1997-1998); J. Simon (1997-2000); D. Depireux (1997-2001); E. Grassi (1999-2003); S. Kalluri (2001-2004); T. Chi (2003-2004); J. Fritz (2001-2005); M. Elhilali (2005-2008); P. Yin (2004-2013); S. David (2009-2011), D. Winkowski (2008-2013), S. Bandyopadhyay (2008-2012), B. Englitz (2009-2012), G. Kennedy Sell (2011-2013), N. Francis (2011-2015), X. Zhou (2010-2014), Kia Lu (2013-2016), Dana Strait (2013-2015), Daniel Doncos (2015-2018), Natalie Trzcinski (2015-2018).

Professional Activities and Awards

Fellow of the Acoustical Society of America, Senior Member of the Institute for Electrical and Electronic Engineers, member of Association for Research in Otolaryngology and the Society for Neuroscience.

Blaise Pascal International Research Chair, l'Université Paris Descartes, 2010
ERC Advanced Senior Award, 2012
K. Vaidyanathan Visiting Chair Professor at the Indian Institute of Science

Academic Editor for PLoS, Action Editor for the Journal of Computational Neuroscience, Academic Board Member Trends in Cognitive Sciences, Reviewer for numerous journals including the Journal of the Acoustical Society of America, J. Neuroscience, J. Neural Networks, Nature, Nature Neuroscience, Science, J. Neurophysiology, IEEE Biomedical Engineering, IEEE Information Theory, IEEE Signal Processing, Biological Cybernetics.

Co-organizer and director of numerous workshops and symposia including most recently the Annual Telluride Workshop on Neuromorphic Cognition (1997-present), partially funded by NSF, ONR, DARPA, and the Whitaker and Gatsby Foundations. Other examples are the NIPS and COSYNE workshops on Neural Mechanisms of Music Perception (1999), Thalamocortical Processing (2002), Attention and Streaming (2006), Mathematical Models of Sound Processing (2012).

Selected Patents

- *Cochlear Filter Bank With Switched Capacitor Circuits.1994 (#5331222)*
- *Intelligibility Assessment using Spectrotemporal Modulations (#60/939,112)*
- *Speech Discrimination with Multiscale Spectrotemporal Modulations (#2003088)*

Current Funding

- **P.I.** *Spectro-temporal Plasticity in Primary Auditory Cortex*, NIH-National Institute of Deafness & Other Communication Disorders, 7/14-6/19, $1.9M. The grant explores the basic properties and neural mechanisms and sources that induce attentional modulations during behavior.
- **P.I.** *Neural correlates of streaming of complex sounds*, NIH-National Institute of Deafness & Other Communication Disorders, 7/11-6/16, $1.9M. The grant investigates the effects of behavior on the neural correlates auditory streaming of tone-complexes.

- **P.I.** *Temporal Coherence Principle in Auditory Scene Analysis,* Army Research Office, 7/14-7/17, $450K. The grant explores an algorithm to segregate audio mixtures based on temporal coherence.
- **Co-P.I.** Multiscale program: Role of temporal coherence in scene segregation. Nat. Institute of Aging**.** 7/10-6/15, $1.9M. This grant explores the psychoacoustics of stream segregation in relation to temporal coherence principle.
- **Co-P.I.** *Workshop on Neuromorphic Engineering*, National Science Foundation, 9/12-8/15, $400K. This grant has provided for over 15 years continued support the organization and travel of international students to attend the 3-week workshop in Telluride Colorado.
- **Co-P.I.** *Figure-Ground Processing, Saliency and Guided Attention for Analysis of Large Natural Scenes*, 5/10 – 4/15, $1.2M. This grant supports computational studies of attention-like mechanisms that can be deployed in monitoring complex and cluttered audio-visual scenes.
- **ERC** *Advanced Senior Grant*. European Union Research Council. 2.4 million euros. Oct 2012-Sept 2017. The grant helps to establish an experimental research program on the mechanisms of hearing at the Ecole normale superieure in Paris, France

A complete list of previous funding awards, grants, and contracts is available upon request

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