Somayeh (Bahar) **Shahsavarani**

(+1) 646-737-2733 | ss6238@columbia.edu | Bahar-Shahsavarani | bahar-shahsavarani

Current Positions

Postdoctoral Research Scientist, 2020-present
Columbia University
Mortimer B. Zuckerman Mind Brain Behavior Institute
Laboratory for Functional Optical Imaging
Jerome L. Greene Science Center, 612 West 130th St, Quad 5B, New York, NY 10027
PI: Dr. Elizabeth Hillman

Previous Positions

Postdoctoral Research Associate, 2018-2020
University of Illinois at Urbana-Champaign
Auditory Cognitive Neuroscience Lab
Department of Speech and Hearing Science and the Neuroscience Program
Beckman Institute for Advanced Science and Technology
PI: Dr. Fatima Husain

Education

Ph.D. Communication Disorders, University of Nebraska-Lincoln, 2018
Dissertation title: The interaction of temporal and spectral acoustic information with word predictability on speech intelligibility, advisor: Dr. Thomas Carrell
M.Sc. Computer Science, University of Nebraska-Lincoln, 2018
Thesis title: Speech emotion recognition using convolutional neural networks, advisor: Dr. Stephen Scott
M.Sc. Biomedical Engineering, Tehran Polytechnic, Iran, 2010
Thesis title: Modeling the neural correlates of motor cortex and brainstem involved in speech production by using artificial neural networks, advisor: Farzad Towhidkhad
B.Sc. Electrical Engineering, K. N. Toosi University of Technology, Tehran, Iran, 2006

Publications

Shahsavarani S, Abraham IT, Zimmerman BJ, Baryshnikov Y, Husain FT, (2020). Comparing Cyclicity Analysis with Pre-established Functional Connectivity Methods to Identify Individuals and Subject Groups using Resting State fMRI. *Frontiers in Computational Neuroscience*, 13:94. https://doi.org/10.3389/fncom.2019.00094.

Shahsavarani S, Khan RA, Husain FT, (2019). Tinnitus and the brain: A review of functional and anatomical MRI studies. Perspectives of the ASHA Special Interest Groups, 4(5), 896-909. https://doi.org/10.1044/2019_PERS-SIG6-2019-0001.

He S, **Shahsavarani BS**, McFayden TC, Wang H, Gill KE, Xu L, Chao X, Luo J, Wang R, He N, (2018). Responsiveness of the electrically stimulated cochlear nerve in children with cochlear nerve deficiency. *Ear and hearing*, 1;39(2):238-50.

He S, McFayden TC, **Shahsavarani BS**, Teagle HF, Ewend M, Henderson L, Buchman CA, (2018). The Electrically Evoked Auditory Change Complex Evoked by Temporal Gaps Using Cochlear Implants or Auditory Brainstem Implants in Children With Cochlear Nerve Deficiency. *Ear and hearing*, 1;39(3):482-94.

In Progress

Shahsavarani S, Schmidt SA, Khan RA, Tai Y, Husain FT. Salience and Attention: Neural Networks Underlying Tinnitus Distress. *Brain Research* (submitted).

Husain FT, Khan RA, Tai Y, **Shahsavarani S**, et al. Evaluating Resound Relief App for Smartphones using Behavior and Brain Imaging (in preparation).

Invited Talks

Shahsavarani S, "Sound Perception from Physical to Phantom," Facebook Reality Labs, June 10, 2020.

Shahsavarani S, "Using Resting State fMRI to better Understand Tinnitus," Beckman Institute for Advanced Science and Technology, May 4, 2020.

Shahsavarani S, "Resting State fMRI: Individual Fingerprint and Group Signature," Medical College of Wisconsin, Milwaukee, Wisconsin, April 14, 2020.

Shahsavarani S, "Using music to identify tinnitus subgroups and hearing loss," Ribeirão Preto Medical School, University of São Paulo, Ribeirão Preto, Brazil, November 25, 2019.

Shahsavarani S, "Using Music to Differentiate Neural Correlates of Tinnitus and Hearing Loss," Mini-workshop on Tinnitus, Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, June 18, 2019.

Shahsavarani S, Tai Y, Schmidt SA, Khan RA, Husain FT, "Passive music listening: a modulation of resting-state functional connectivity to better dissociate tinnitus," Acoustical Society of America Spring 2019 meeting, Louisville, KY, May 13-17, 2019.

Shahsavarani S, "Sound perception: from linguistic to paralinguistic, from physical to phantom," University of Illinois at Urbana-Champaign, Department of Speech and Hearing Science, September 21, 2018.

Shahsavarani S, "Decoding emotion in speech using convolutional neural networks," University of Nebraska-Lincoln, Department of Computer Science and Engineering, March 14, 2018.

Shahsavarani S, "Sensory and artificial neural network representation of words and emotions," Arizona State University, Department of Speech and Hearing Science, November 30, 2017.

Shahsavarani S, "The interaction of spectral and temporal information with semantic cues in speech intelligibility," Boys Town National Research Hospital, June 3, 2016.

Podium Presentations

Shahsavarani S, Khan R, Schmidt S, Tai Y, Husain F. Reorganization of intrinsic neural networks associated with tinnitus. Session Title: Human Imaging and Connectivity. The 49th annual meeting, *Society for Neuroscience*. Chicago, Illinois, October 19-23, 2019.

Husain FT, **Shahsavarani S**, Tai Y, Khan R, et al. A Large Scale Brain Imaging Study using fMRI to Understand Tinnitus and its Impact in Military and Civilian Population. *Special Session on Blast-Induced Tinnitus, Military Health System Research Symposium* (MHSRS), Kissimmee, Florida, August 19-22, 2019.

Tai Y, **Shahsavarani S**, Khan RA, Schmidt SA, Husain FT. Are gray matter volume changes at frontal brain regions associated with speech-in-noise performance in tinnitus patients? *The 12th conference of Tinnitus Research Initiative/3rd Cross-Strait Tinnitus Seminar*. Taipei, Taiwan, May 17-19, 2019.

Shahsavarani S, Schmidt S, Tai Y, Khan R, Husain TF. Tinnitus-related changes in intrinsic neural networks. The 42dn Annual Midwinter Meeting, *Association for Research in Otolaryngology*. Baltimore, Maryland, February 09-13, 2019.

Husain FT, Schmidt S, Zimmerman B, Tai Y, **Shahsavarani S**, Khan R, Abraham I, Ramos P, Wilson C, Granato E, Sherman P, Esquivel C. Test-retest reliability of tinnitus questionnaires and

brain imaging measures at military and civilian sites. *Special Session on Blast-Induced Tinnitus, Military Health System Research Symposium* (MHSRS), Kissimmee, Florida, August 19-22, 2018.

Shahsavarani BS, Carrell T, Samal A. How Amplitude Envelope and Spectral Resolution Interact with Word Predictability to Facilitate Speech Intelligibility, Speech Perception Session. The 40th Annual Midwinter Meeting, *Association for Research in Otolaryngology.* Baltimore, Maryland, February 11-15, 2017.

Shahsavarani BS, Bashford S, He S. Effects of Stimulating Electrode Site and Pulse Rate on Adaptation Recovery Function of the Auditory Nerve, Auditory Prostheses Session. The 40th Annual Midwinter Meeting, *Association for Research in Otolaryngology.* Baltimore, Maryland, February 11-15, 2017.

Poster Presentations

Shahsavarani S, Khan R, Schmidt S, Tai Y, Husain F. Reorganization of intrinsic neural networks associated with tinnitus. *Advances and Perspectives in Auditory Neuroscience.* Chicago, Illinois, October 18, 2019.

Abraham IT, **Shahsavarani S**, Zimmerman B, Baryshnikov YM, Husain FT. Cyclicity vs. similarity measures for fMRI resting state time series analysis. Session Title: Analytical Computational Models. The 49th annual meeting, *Society for Neuroscience.* Chicago, Illinois, October 19-23, 2019.

Shende S, **Shahsavarani S**, Tai Y, Mudar R, Husain FT. Voxel-based morphometry in age-associated hearing loss: A preliminary study. Session Title: Discovery and Treatment Studies in Auditory and Visual Preclinical Neuroscience. The 49th annual meeting, *Society for Neuroscience.* Chicago, Illinois, October 19-23, 2019.

Khan R, Schmidt S, Tai Y, **Shahsavarani S**, Husain F. What white matter plasticity can tell us about the associations between hearing loss and tinnitus. The 49th annual meeting, *Society for Neuroscience.* Chicago, Illinois, October 19-23, 2019.

Shahsavarani S, Carrell T. Hidden Intelligibility: Interaction between Independent Acoustic Dimensions and Word Predictability. The 42th Annual Midwinter Meeting, *Association for Research in Otolaryngology.* Baltimore, Maryland, February 09-13, 2019.

Khan R, Schmidt S, Tai Y, **Shahsavarani S**, Husain F. Correlations between white matter integrity and measures of tinnitus and hearing loss. *Midwest Auditory Research Conference.* Springfield, Illinois, July 11-13, 2019.

Tai Y, **Shahsavarani S**, Khan R, Schmidt S, Husain FT. Relation between Gray Matter Volume and Speech-in-noise Performance in Tinnitus Patients with Normal Hearing Sensitivity. The 42dn Annual Midwinter Meeting, *Association for Research in Otolaryngology.* Baltimore, Maryland, February 09-13, 2019.

Khan R, Schmidt S, **Shahsavarani S**, Tai Y, Husain FT. An Investigation into the White Matter Deficits associated with Tinnitus and Hearing Loss. The 42dn Annual Midwinter Meeting, *Association for Research in Otolaryngology.* Baltimore, Maryland, February 09-13, 2019.

Husain FT, Zimmerman B, Abraham I, Schmidt S, **Shahsavarani S**, Khan R, Baryshnikov Y. Automated identification of tinnitus patients using replicable resting state fMRI data. *Sixth biennial conference on resting-state and brain connectivity*, Montreal, Quebec, Canada, September 26-28, 2018.

He S, McFayden TC, **Shahsavarani, BS**, Gill KE. Temporal gap and amplitude modulation detection evaluated using the electrically evoked auditory change complex in patients with auditory brainstem implants. 172nth Meeting of the *Acoustical Society of America*, Honolulu, Hawaii, November 28 - December 02, 2016.

Shahsavarani B, Carrell T, Samal A (2015). The effect of semantic cues on intelligibility: A comparison between spectrally sparse speech and natural speech in noise. The 170th Meeting of the *Acoustical*

Society of America, Jacksonville, FL, November 02-06, 2015.

Honors & Awards

The instructor ranked as outstanding by students, University of Illinois at Urbana-Champaign, Spring 2020

Travel Award from the Psychological and Physiological Acoustics Technical Committee, Acoustical Society of America, Louisville, Spring 2019.

Graduate Student Travel Award, Annual MidWinter Conference, ARO Graduate Student/Postdoctoral Fellow Travel Awards, Maryland, Winter 2017.

Graduate Travel Award, University of Nebraska-Lincoln, Spring 2017.

Grants for Participation in Professional Conferences, College of Education and Human Sciences, University of Nebraska-Lincoln, Fall 2015.

Teaching Assistantship, Department of Computer Science and Engineering, University of Nebraska-Lincoln, 2013-2017.

Research Assistantship, Department of Communication and Disorders, University of Nebraska-Lincoln, 2012-2015.

Teaching Experience

Teaching

Instructor: Electrophysiologic Indices of Audition (SHS 551), Department of Speech and Hearing Science, University of Illinois at Urbana-Champaign, Spring 2020

Guest lecturer: Tinnitus (SHS 558), Department of Speech and Hearing Science, University of Illinois at Urbana-Champaign, Fall 2019

Guest lecturer: Resting-state fMRI in hearing disorders (one session), Interdisciplinary Approaches to Neuroscience II (NEUR 598), the Neuroscience Program, University of Illinois at Urbana-Champaign, Spring 2019

Guest lecturer: primer (one session), Department of Speech and Hearing Science, University of Illinois at Urbana-Champaign, Fall 2018

Guest lecturer: Voxel-based morphometry using CAT12 (two sessions), Department of Speech and Hearing Science, University of Illinois at Urbana-Champaign, Sprint 2018

Graduate Teaching Assistant

Design and analysis of algorithms (CSCE 423/823), Department of Computer Science, University of Nebraska-Lincoln, Fall 2015, Spring 2016, Summer 2016, Spring 2017, Fall 2017

Speech Perception (SLPA 964), Department of Communication Disorders, University of Nebraska-Lincoln, Spring 2017

Machine learning (CSCE 478/878), Department of Computer Science, University of Nebraska-Lincoln, Fall 2014, Fall 2016

Computer vision (CSCE 473/873), Department of Computer Science, University of Nebraska-Lincoln, Spring 2015

Auditory Signal Processing (SLPA 910), Department of Communication Disorders, University of Nebraska-Lincoln, Fall 2017

MATLAB programming (CSCE 155), Department of Computer Science, University of Nebraska-Lincoln, Spring 2014)

Java programming (CSCE 155), Department of Computer Science, University of Nebraska-Lincoln, Fall 2013

Neural Foundation of Speech and Language (SLPA 853), Department of Communication Disorders, University of Nebraska-Lincoln, Fall 2012

Student Mentoring

Madhuri Krishna Murthy Ratnakumar, Deparment of Bioengineering, University of Illinois at Urbana-Champaign

Shraddha Arun Shende, PhD Student, Department of Speech and Hearing Science, University of Illinois at Urbana-Champaign

Brianna Wardyn, Department of Special Education and Communication Disorders, University of Nebraska-Lincoln

Seth Roy, Department of Computer Science, University of Nebraska-Lincoln

Service

REVIEW EDITOR : Frontiers in Auditory Cognitive Neuroscience

AD HOC REVIEWER : Scientific Reports, Action on Hearing Loss PhD Studentship, Trends in Hearing, IEEE Access, Unitec Institute of Technology

MENTORED REVIEWER : Trends in Hearing, International Joint Conferences on Artificial Intelligence Organization

Professional Membership

Cognitive Neuroscience Society (CNS)
Society for Neuroscience (SfN)
Association for Research in Otolaryngology (ARO)
Acoustical Society of America (ASA)

Certificates

Introduction to Neurohacking In R by Johns Hopkins University on Coursera. Certificate earned on April, 2018
Principles of fMRI 1 by Johns Hopkins University & University of Colorado Boulder on Coursera. Certificate earned on March 1, 2018
Convolutional Neural Networks by deeplearning.ai on Coursera. Certificate earned on December 3, 2017
Structuring Machine Learning Projects by deeplearning.ai on Coursera. Certificate earned on October 18, 2017
Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization by deeplearning.ai on Coursera. Certificate earned on October 1, 2017
Neural Networks and Deep Learning by deeplearning.ai on Coursera. Certificate earned on September 9, 2017
Institute for International Teaching Assistants at University of Nebraska-Lincoln. Certificate earned on August 8, 2014

Skills

PROGRAMMING : Python, MATLAB, C++, R, Bash

SOFTWARE : SPM, CAT12, CONN