**Nathaniel J. Zuk**

School of Engineering

Trinity College Dublin

College Green, Dublin 2, Ireland

Phone: (240) 620-6429

[nzuk@ur.rochester.edu](mailto:nzuk@ur.rochester.edu)

www.natezuk.me

**Research**

**2018 – present Trinity College, Dublin, Ireland**

**2016 – 2018 University of Rochester, Rochester, NY**

Research Fellow

Lalor Lab for Computational Cognitive Neurophysiology

Focus: Neural decoding of rhythm in speech and music using electroencephalography

**Education**

**2011 – 2016 Harvard – Massachusetts Institute of Technology, Cambridge MA**

PhD, Speech and Hearing Bioscience and Technology Program

Advisor: Bertrand Delgutte

Thesis: “Neural coding of time-varying interaural time differences and its relation to perception”

**2006 – 2011 University of Rochester, Rochester NY**

BS, Biomedical Engineering

Minor, Mathematics

Take Five Scholarship, “Music: Science and Composition”

**Publications**

Zuk NJ, Murphy JW, Lalor EC (in preparation) Nonlinear EEG decomposition reveals distinct temporal processing for speech and music.

Zuk NJ, Delgutte B (in review) Neural coding and perception of auditory motion direction.

Zuk NJ, Carney LH, Lalor EC (2018). Preferred tempo and low-audio-frequency bias emerge from simulated sub-cortical processing of sounds with a musical beat. *Front Neurosci* 12:349. doi: 10.3389/fnins.2018.00349

Zuk N, Delgutte B (2017) Neural coding of time-varying interaural time differences and time-varying amplitude in the inferior colliculus and its relation to perception. *J Neurophysiol,* 118(1): 544-563.

**Presentations**

Zuk N, Murphy J, Lalor E. Distinct temporal processing schemes for speech and music. Poster session at: *Society for Neuroscience Meeting* 2017 Nov 11-15; Washington, DC.

Zuk N, Lalor E. Assessing musical beat perception using simulated auditory nerve and midbrain activity. Poster session at: *Advances and Perspectives in Auditory Neuroscience* 2017 Nov 10; Washington, DC.

Zuk N, Murphy J, Lalor E. Distinct temporal processing schemes for speech and music. Poster session at: *International Conference on Auditory Cortex* 2017 Sept 10-15; Banff, Alberta, Canada.

Zuk N. Assessing musical beat perception based on simulated low-level neural activity. *New England Sequencing and Timing* 2017 March 25; Storrs, CT. Conference presentation.

Zuk N. Neural coding of time-varying interaural time differences (ITD) in the inferior colliculus: relation to human performance in motion direction identification and binaural gap detection. *The Association for Research in Otolaryngology Midwinter Meeting*, 2017 Feb 11-15; Baltimore, MD. Conference presentation.

Zuk N. Neural coding of motion direction and “binaural gaps” in the inferior colliculus. *Binaural Bash*, 2016 Nov 18-19; Boston, MA. Conference presentation.

Zuk N. Rate and temporal coding of time-varying ITDs in the inferior colliculus. *Binaural Bash*, 2015 Oct 30; Boston, MA. Conference presentation.

Zuk N, Delgutte B. Rate and temporal coding of dynamic ITD and amplitude modulation in the inferior colliculus may explain differences in psychophysical detection limits. Poster session at: *Society for Neuroscience Meeting* & *Advances and Perspectives in Auditory Neuroscience*, 2015 Oct 16-21; Chicago, IL.

Zuk N, Delgutte B. Is the neural coding of dynamic interaural time differences related to the coding of amplitude modulation? Poster session at: *The Association for Research in Otolaryngology Midwinter Meeting*, 2014 Feb 22-26; San Diego, CA.

Zuk N, Seidman SH, Carney LH, Schiavenato M. Pain assessment of neonates using an automated signal analysis device. Poster session at: *Biomedical Engineering Society Annual Meeting*, 2009 Oct 7-10; Pittsburgh, PA.

**Honors and Awards**

Graduate Student Council Travel Grant at MIT, 2015

Amelia-Peabody Scholarship at the Massachusetts Eye and Ear, 2014

Association for Research in Otolaryngology Graduate Student Travel Award, 2014

Take Five Scholar at the University of Rochester, 2011

Alpha Eta Mu Beta (National Biomedical Engineering Honor Society), 2010

Tau Beta Pi (Engineering Honor Society), 2010

National Society of Collegiate Scholars, 2010

Australia’s Student Mobility Scholarship, 2009

**Teaching**

“Here Hear!: What’s going on in the ear?” – Lecturer, SPLASH!, MIT Educational Studies Program, 2015

“Second Order Systems, bootcamp session” – Lecturer, Speech and Hearing Bioscience and Technology Program, Harvard, 2015

“Acoustics” -- Teaching Assistant, Electrical Engineering and Computer Science Dept., MIT, 2013

“General Chemistry” -- Teaching Assistant, Chemistry Dept., University of Rochester, 2007-2008

**Community Service**

Student-Postdoctoral Chapter Steering Committee, Association for Research in Otolaryngology, 2015-2018

Website Committee, Association for Research in Otolaryngology, 2014-2018

“Sounds to See”, MIT + K12 initiative (<http://youtu.be/FeSJ3gODauM>), 2013