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Engineering & Scientific Consulting

EunSeon Emery-Ahn, Ph.D.

Scientist | Human Factors
Menlo Park
+1-310-754-2706 | eemery-ahn@exponent.com

Professional Profile

Dr. Emery-Ahn specializes in human sensory perception with research experience spanning multisensory processing, audiovisual integration, signal detection, reaction time, error processing, and cognitive impairments in individuals with neurological disorders. Using her expertise in human perception and behavior, she investigates and analyzes human factors and performance across a broad spectrum of scenarios including transportation and pedestrian accidents, trip-and-fall incidents, product warnings, and consumer product usability.

Prior to joining Exponent, Dr. Emery-Ahn completed her PhD in Psychology (with a focus on Cognitive Neuroscience) and Scientific Computing from University of Michigan. Her doctoral research focused on the neural mechanisms underlying multisensory perception, i.e., how information from one sensory system influences processing in other sensory systems. Her primary focus was on the interplay between audition and vision, exploring the ways in which sounds shape our visual perceptions and how our vision, in turn, influences what we hear. Her work investigated how visual information may be used to extract auditory information as well as when and how the brain integrates these sensory inputs such that they are perceived as originating from a single source even when vision and audition provide conflicting information.

In addition to her core research, Dr. Emery-Ahn has investigated brain signals related to error production and altered sensory and cognitive functions in brain tumor patients with the goal of improving functional outcomes of patients following brain surgery. Specifically, her tumor work focused on human factors that influence accurate patient evaluation during awake brain surgeries as well as characteristics of the brain tumors associated with greater cognitive impairments. In doing so, she utilizes a variety of methods such as psychophysics, neuroimaging, brain stimulation, and lesion mapping to address her research questions.

Academic Credentials & Professional Honors

Ph.D., Psychology, University of Michigan, Ann Arbor, 2023

B.S., Cognitive Neuroscience, University of Michigan, Ann Arbor, 2015

Ed Smith Award for Excellence in Cognitive Neuroscience (2023

Academic Appointments

Graduate Student Instructor, Department of Psychology, University of Michigan, Ann Arbor (2019 – 2022)

Prior Experience

Lab Manager, Multisensory Perception Lab, University of Michigan, Ann Arbor, 2016 – 2018

Clinical Research Technician, Michigan Medicine, 2015 - 2016

Professional Affiliations

Society for Neuroscience

Cognitive Neuroscience Society

Publications

Aabedi AA, Ahn E, Kakaizada S, Valdivia C, Young JS, Hervey-Jumper H, ... Hervey-Jumper SL. Assessment of wakefulness during awake craniotomy to predict intraoperative language performance. Journal of neurosurgery 2019; 132(6), 1930-1937.

Plass J, Ahn E, Towle VL, Stacey WC, Wasade VS, Tao J, Wu S, Issa NP, Brang D. Joint encoding of auditory timing and location in visual cortex. Journal of cognitive neuroscience 2019; 31(7):1002-17.

Brang D, Plass J, Sherman A, Stacey WC, Wasade VS, Grabowecky M, Ahn E, Towle VL, Tao JX, Wu S, Issa NP. Visual cortex responds to sound onset and offset during passive listening. Journal of neurophysiology 2022;

Kao HY, Hu S, Mihaylova T, Ziobro J, Ahn E, Fine C, Brang D, Watson BO, Wang Y. Defining the latent period of epileptogenesis and epileptogenic zone in a focal cortical dysplasia type II (FCDII) rat model. Epilepsia. 202; 62(5):1268-79.

Brang D, Ahn E. Double-blind study of visual imagery in grapheme-color synesthesia. Cortex 2019;117:89-95.

Aabedi AA, Kakaizada S, Young JS, Ahn E, Weissman DH, Berger MS, Brang D, Hervey-Jumper SL. Balancing task sensitivity with reliability for multimodal language assessments. Journal of Neurosurgery. 2021; 135(6):1817-24.

Presentations

Ahn E, Kaur J, Hervey-Jumper SL, Lee T, Brang D. Comparing the causal involvement of the posterior superior temporal sulcus in audiovisual facilitation versus the McGurk effect. Poster presentation, Cognitive Neuroscience Society, San Francisco, CA, 2023.

Brang D, Plass J, Ahn E. Visual cortex responds to transient sound changes without encoding complex auditory dynamics. Symposium presentation, International Multisensory Research Forum, Ulm, Germany, 2022.

Ahn E, Dark S, Wiese O, Fine C, Kakaizada S, Kaur J, Hervey-Jumper SL, Brang D. Quantifying the causal impact of different sub-regions of tumor lesion on semantic naming function. Poster presentation, Society for Neuroscience, Chicago, IL, 2021.

Ahn E, Plass J, Brang D. Continuous tracking of error-related negativity via electrocorticography in humans. Poster presentation, Society for Neuroscience, Chicago, IL, 2019.

Ahn E, Brang D. Double-Blind Study of Visual Imagery in Grapheme-Color Synesthesia. Poster presentation, Cognitive Neuroscience Society, San Francisco, CA, 2019.

Ganesan K, Ahn E, Plass J, Stacey W, Brang D. Silent lip reading generates speech signals in auditory areas: Evidence from intracranially implanted electrodes in humans. Poster presentation, Cognitive Neuroscience Society, San Francisco, CA, 2019.

Plass J, Ahn E, Sherman A, Towle V, Stacey W, Wasade V, Tao J, Wu S, Issa N, Garbowecky M, Suzuki S, Brang D. Spatiotemporal information conveyed by crossmodal phase- reset: An electrocorticography approach. Poster presentation, Cognitive Neuroscience Society, San Francisco, CA, 2019

Ahn E, Plass, J, Rakochi, A, Stacey W, Brang D. Neural networks supporting auditory-visual speech: Evidence from invasive neural recordings in humans. Poster presentation, International Multisensory Research Forum, Toronto, Canada, 2018

Ganesan K, Plass J, Ahn E, Rakochi A, Stacey W, Brang D. A model for modulated speech perception in the McGurk effect. Poster presentation, International Multisensory Research Forum, Toronto, Canada, 2018.

Ahn E, Rakochi A, Zweig LJ, Suzuki S, Grabowecky M, Towle VL, Tao J, Wu S, Stacey W, Brang D. Lipreading Primes Auditory Cortical Networks Prior to Speech: Evidence from Invasive Neural Recording in Humans. Poster presentation, International Multisensory Research Forum, Nashville, TN, 2017.

Rakochi A, Ahn E, Nair A, Towle VL, Tao J, Wu S, Stacey W, Brang, D. Peripherally-presented sounds facilitate early visual processing of spatially aligned visual targets: Evidence from intracranial electrophysiological recordings in humans. Poster presentation, International Multisensory Research Forum, Nashville, TN, 2017.