Zenith

INTERNATIONAL PHD PROGRAM IN NEUROSCIENCE

In collaboration with SmartNets

WEDNESDAY, 17 MAY 2023
AT 5:00 PM (CET)

Grace W. LINDSAY

LINDSAY Lab,
New York University (NYU)

ZENITH SEMINARS

CONNECTING PERFORMANCE BENEFITS ON VISUAL TASKS TO NEURAL MECHANISMS USING CONVOLUTIONAL NEURAL NETWORKS

Behavioral studies have demonstrated that certain task features reliably enhance classification performance for challenging visual stimuli. These include extended image presentation time and the valid cueing of attention. Here, I will show how convolutional neural networks can be used as a model of the visual system that connects neural activity changes with such performance changes. Specifically, I will discuss how different anatomical forms of recurrence can account for better classification of noisy and degraded images with extended processing time. I will then show how experimentally-observed neural activity changes associated with feature attention lead to observed performance changes on detection tasks. I will also discuss the implications these results have for how we identify the neural mechanisms and architectures important for behavior.

Grace Lindsay is an Assistant Professor of Psychology and Data Science at New York University. She holds a B.S. in Neuroscience from University of Pittsburgh and a Ph.D. in Neurobiology and Behavior from Columbia University. Her research focuses on the use of artificial neural networks as models of biological information processing. With her group she is interested in pursuing studies on the relationship between attention and learning and reflecting on the tools neuroscientists use to understand neural data. As a joint faculty member in the Center for Data Science, she also works on applied machine learning to tackle climate change. Prior to starting at NYU, Grace Lindsay was a postdoctoral fellow at the Gatsby Computational Neuroscience Unit at University College London and spent a year as a research fellow at the Bernstein Center for Computational Neuroscience in Freiburg, Germany. She is the author of the popular science book *Models of the Mind: How Physics, Engineering and Mathematics Have Shaped Our Understanding of the Brain*.

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