



# CoCo Seminar Series Fall 2020

## Insights into Human Cognition through Machine Learning

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Engineering, Fairfield University**

**Wednesday October 21, 2020 11:00am-12:00pm**  
**Online (Zoom meeting link available on  
<http://coco.binghamton.edu/>)**



Brain-Computer Interfaces (BCI) attempt to measure neuronal activity in the brain of a computer user and use those measurements to infer the user's cognitive state. This is a highly interdisciplinary area of study, which overlaps with neuroscience, psychology, and computer science. Applications of BCI include interactive media, adaptive user interfaces, accessible user interfaces, usability testing, human-machine teaming, etc. In this talk, the author will present his work on improving BCI using machine learning. He used a brain activity sensor called functional Near InfraRed Spectroscopy (fNIRS), which uses near-infrared light to measure blood flow in the cerebral cortex of the brain. He developed novel preprocessing and machine learning techniques to analyze fNIRS data and infer user emotion and cognitive workload. In addition to detailing the techniques he used, he will talk about the current trends in this area and the implications of this research for the future of humanity.

Danushka Bandara received his Ph.D. in Electrical and Computer Engineering and M.S. in Computer Engineering from Syracuse University in 2018 and 2013, respectively, and a B.S. in Electrical Engineering with honors from the University of Moratuwa in 2009. Prior to joining Fairfield University, he worked as a Data Scientist at Corning Incorporated. The focus of his Ph.D. research was on the application of machine learning to brain activity data. His current research interests include machine learning, human-computer interaction, computer vision, pattern recognition, and signal processing. For more information, contact Hiroki Sayama ([sayama@binghamton.edu](mailto:sayama@binghamton.edu)).  
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