

Departmental Seminar

Machine Learning Based Approaches to Understanding Human Attention

12:30 p.m. – 1:30 p.m. | November 26, 2021 (Friday)

Rm 813, 8/F, The Jockey Club Tower | Centennial Campus | The University of Hong Kong



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Abstract

The advance of machine learning methods has recently revolutionized artificial intelligence research and technology development. In this talk, I will present two examples to demonstrate how machine learning methods can be used to understand human attention and benefit research in both Cognitive Science and Computer Science. First, for analyzing human attention data, we have recently developed a novel machine learning based approach, Eye Movement analysis with Hidden Markov Models (EMHMM). This approach provides quantitative measures of eye movements that reflect individual differences in both temporal and spatial dimensions of eye movements. It has led to novel findings in cognitive research not revealed by traditional analysis methods. The developed HMM methodology can also be applied to any time series data such as travel patterns or brain imaging data. Second, for modeling human attention, we have developed a deep learning model that interacts with an attention mechanism summarized in an HMM to understand the role of eye movements in cognitive tasks. These two proposed approaches can be applied to a wide range of research fields that use eye movements to understand human cognition and behavior, or use human attention to guide model development, including mental health, education, explainable artificial intelligence, etc.

About the Speaker

Janet Hsiao received the B.S. degree in Computer Science and Information Engineering from National Taiwan University in 1999, the M.S. degree in Computing Science from Simon Fraser University in 2002, and the Ph.D. degree in Informatics from University of Edinburgh in 2006. From 2005 to 2008, she was a Postdoctoral Researcher in the Department of Computer Science and Engineering and the Temporal Dynamics of Learning Center at the University of California, San Diego. She is currently an associate professor in the Department of Psychology and a principal investigator of the State Key Laboratory of Brain and Cognitive Sciences at University of Hong Kong. Her research interests include cognitive science, computational modeling, eye movement analysis, and learning and expertise acquisition. She was a recipient of the Best Language Modeling Paper Prize from the Cognitive Science Society in 2006 and the Early Career Award from the Research Grants Council of Hong Kong in 2012. She has served on Annual Meeting Program Committee of the Cognitive Science Society since 2016 and is currently an Associate Editor of its flagship journal *Cognitive Science*. She is also currently a Section Editor for *Cognition*.

Zoom Meeting (For participants who couldn't attend the Seminar in person)

<https://hku.zoom.us/j/3951550048?pwd=SncvL3RYakEycUtpL29vdDJEdlEwdz09>

Meeting ID: 395 155 0048 | Password: psyc



~All are Welcome~

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