Department of Psychology
The University of Hong Kong
香港大學心理學系

Departmental Seminar

Understanding Eye Movement Patterns in Face Recognition using Hidden Markov Models

3:30 p.m. – 4:30 p.m.│ April 12, 2018 (Thursday)
Rm 813, 8/F, The Jockey Club Tower│ Centennial Campus │The University of Hong Kong

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Abstract

Recent research has reported substantial individual differences in eye movement patterns in visual tasks. Thus, it is important to take these individual differences into account in eye movement data analysis. In this talk, I will introduce our state-of-the-art Eye Movement analysis with Hidden Markov Models (EMHMM) approach and how this approach leads to new discoveries in face recognition thus far not revealed by existing methods. In this approach, each individual's eye movements are modeled with an HMM, including both person-specific regions of interests (ROIs) and transitions among the ROIs. Individual HMMs can be clustered to discover common patterns, and similarities between patterns can be quantitatively assessed. Through this clustering, we discovered holistic (looking mostly at the face center) and analytic (looking mostly at the two eyes in addition to the face center) patterns in face recognition. The frequency of participants adopting the two patterns did not differ significantly between Asians and Caucasians, suggesting little modulation from culture. Significantly more participants showed similar eye movement patterns when viewing own- and other-race faces than different patterns. Interestingly, analytic patterns were associated with better face recognition performance and higher activation in brain regions important for top-down control of visual attention, whereas holistic patterns were associated with ageing and lower cognitive status in older adults. This result suggests the possibility of using eye movements as an easily deployable screening assessment for cognitive decline or deficits.

~All are Welcome~

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