

The University of Hong Kong
Department of Psychology

Departmental Seminar

***On-line or Model-based Control:
How is Locomotion Visually Controlled?***

Date: November 12, 2014 (Wednesday)

Time: 11:30 a.m. – 12:30 p.m.

Venue: Room 8.13, 8/F The Jockey Club Tower, Centennial Campus,
HKU

Speaker: Dr. Zhao Huaiyong
Brown University

On-line and model-based control are two general approaches to the visual control of action. According to on-line control, action is controlled on-line by current visual information. In contrast, according to model-based control, action is controlled on the basis of an internal world model. An internal world model might be a spatial memory of the layout (Loomis & Beall, 2004), a representation of an object's trajectory (McIntyre, et al, 2001), or a model that mimics an object's behavior, which can control action when decoupled from current visual input (Craig, 1946; Clark & Grush, 1999; Wolpert & Ghahramani, 2000). In this talk, I will present research that investigates how locomotion is controlled by manipulating the visibility of targets in a virtual environment. Participants either walked a slalom course of 5 stationary targets (Exp 1) or walked to intercept a moving target (Exp 2 and 3). Targets were either fully visible, blurred to different levels, or completely occluded. The results indicate that locomotor control is strongly dependent on current visual information. Target occlusion significantly impairs performance and leads to a stereotyped steering adjustment. Even after 40 repetitions, a moving target's behavior (speed up or slow down) was not learned or used to control interception adaptively. These findings imply that an internal model is not sufficient to control locomotion; rather, locomotion is normally controlled by current visual information, consistent with on-line control.