



香港城市大學
City University of Hong Kong
三十周年紀念 30th Anniversary

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Department of Biomedical Sciences presents a seminar on Neuroscience

Adaptive Visual Cortical Processing

By

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Date: 3 June 2014 (Tuesday)
Time: 2:00 pm – 3:00 pm
Venue: Room B4302, Academic 1
City University of Hong Kong
Tat Chee Avenue, Kowloon Tong

Abstract:

The traditional point of view of image processing in the brain emphasizes a hierarchical order: information about local simple image components such as line segments is first extracted in early visual cortex, whereas more complex stimulus features such as global forms are processed subsequently in higher-order cortical areas by integrating primitive features. In the primary visual cortex (area V1) response properties of neurons are generally thought to be rather simple and stereotyped, mainly dependent on hardwired neural circuitry. In contrast to this oversimplified bottom-up point of view, our recent studies in awake monkeys have shown that V1 neurons dynamically change their response properties according to perceptual task as well as stimulus context. The analyses of visual images depend on complex interactions among V1 and higher-order visual cortical neurons and between stimulus-driven and goal-directed processes. Moreover, repeatedly performing the same perceptual task, and therefore, repetitively invoking top-down influences specific to the task can potentiate the adaptive changes in V1 that are useful for solving the task. Our findings indicate that even V1, the earliest cortical stage along the hierarchically organized visual pathway, is capable of running different computation algorithms tailored to different stimulus context and perceptual tasks. This could reflect a general adaptive processing mechanism in sensory cortex.

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~ All are Welcome ~