



전자전기컴퓨터학부 세미나안내



1. 제목 : Hierarchical Processing in the Human Visual System
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1999-2005 Associate Chair, Department of Psychology.
1996- Professor, Department of Psychology, University of Minnesota
1993-94 Visiting Professor, Max Planck Institute for Biological Cybernetics
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1991-96 Associate Professor, Department of Psychology, University of Minnesota
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1986 -89 Assistant Professor, Cognitive and Linguistic Sciences Brown University
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7. 내용요약 :

Human ability to accurately interpret and act on the visual world rests on a dozen or more cortical brain areas. These areas are believed to be arranged in a hierarchy in which multiple local features of an object, such as its edges, are extracted in the lowest level (primary visual cortex, V1) and then fed forward to upper levels of the hierarchy (e.g. V2, V3, MT, LOC) where information is progressively integrated to provide estimates of object properties, such as movement, depth, size, shape, and identity. The hierarchical model has been extraordinarily fruitful, providing qualitative explanations of behavioral and neurophysiological results. However, there is increasing evidence that visual cortical areas are doing more than extracting and integrating local features in a primarily feedforward flow of information. While it has been known for some time that there are backward, as well as forward, connections between areas, and lateral connections within areas, the computational functions of feedback and within-area signaling is largely unknown. I will present several results from

neuroimaging (BOLD fMRI) studies of V1 in humans suggesting that the lateral connections may be important for interpolating features within an object, and the feedback connections important for the perceptual organization of the shape and size of objects. I will discuss these results in terms of Bayesian theories of vision that emphasize prediction and involve the interplay of feedforward, lateral, and feedback processing.

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