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*Extensions of visual hierarchical processing: From space to time and memory*

Abstract:

The human nervous system processes visual inputs in multiple stages, spanning retina and brain. These stages are often approximated as a hierarchy. A well-established principle is that the spatial scale of image analysis is smallest in the earliest stages of processing (retina), and increasingly large in later stages (primary visual cortex and beyond). This feature of the visual system is important for recognition and visual behavior. In this talk I consider recent and ongoing work in my lab that addresses two related questions about the visual hierarchy: First, how do the successive stages of processing in human visual cortex pool visual inputs over time? Are the successive stages of temporal processing similar to those for spatial processing? Second, how do the multiple visual areas respond during memory of visual stimuli? And how do the patterns during visual memory compare to those for seen stimuli? Together, the results show that in both domains, temporal processing and visual memory, there are some striking similarities and some important differences compared to how spatial information is processed in the cortical visual pathways.