OPAM 2005 Program

8:15	Opening Remarks	
	Session Chair: Aude Oliva	**Factors Influencing Object Perception**
8:20	Cate and Behrmann	The unlikely perception of figural shape from 3D concavities
8:35	Chouchourelou, Matsuka, and Shiffrar	Does emotion systematically influence visual perception?
8:50	Chuang, Vuong, Thornton, and Buelthoff	Recognising novel deforming objects
9:05	Sadr, Troje, and Nakayama	Axes vs averages: High-level representations of dynamic point-light forms
9:20	Break	
	Session Chair: Andy Leber	**Selection of Object Features**
9:30	Davidenko and Ramscar	The distinctiveness effect reverses when using well-controlled distractors
9:45	Goolsby, Raymond, and Shapiro	Affective consequences of attentional inhibition depend on selection task
10:00	Leblanc, Prime, and Jolicoeur	Contingent capture: A visuo-spatial effect? Evidence from electrophysiology
10:15	Burnham, Neely, Walker, and Neill	Interference from irrelevant color-singletons during serial search depends on attention being spatially diffuse
10:30-11:50	Poster Session: Sheraton Hall	
12:00	Lunch	
	Session Chair: Steve Mitroff	**Dynamics of Object-based Attention**
1:00	Fencsik, Urrea, Place, Wolfe, and Horowitz	Differences in speed aid visual search and multiple-object tracking
1:15	Franconeri, Pylyshyn, and Scholl	Spatiotemporal cues for tracking multiple objects through occlusion
1:30	Richard, Lee, and Vecera	Effects of object-based attention: Sensory enhancement or prioritization
1:45	Gersch, Schnitzer, Sanghvi, Dosher, and Kowler	Attentional enhancement along the path of a sequence of saccades
2:00	Break	
	Session Chair: Kate Arrington	**Object Processing in Other Cognitive Processes**
2:10	Fougnie and Marois	Executive load in working memory induces inattentional blindness
2:25	Singhal, Kaufman, Valyear, and Culham	fMRI reactivation of the lateral occipital complex during delayed actions
2:40	Song and Nakayama	Control of speed and accuracy set points in manual-pointing movements
2:55	Introduction of Keynote	
3:00	Goodale	Visual routes to knowledge and action
4:00	Closing Remarks	

Visual Routes to Knowledge and Action

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Visual systems first evolved not to enable animals to see, but to provide distal sensory control of their movements. Vision as 'sight' is a relative newcomer on the evolutionary landscape, but its emergence has enabled animals to carry out complex cognitive operations on representations of the world. In the more ancient visuomotor systems, there is a basic isomorphism between visual input and motor output. In representational vision, there are many cognitive 'buffers' between input and output. Thus, in this system, the relationship between what is on the retina and the behaviour of the organism cannot be understood without reference to other mental states, including those typically described as "conscious". The duplex nature of vision is reflected in the organization of the visual pathways in the primate cerebral cortex. The dorsal 'action' stream projecting from primary visual cortex to the posterior parietal cortex provides flexible control of more ancient subcortical visuomotor modules for the control of motor acts. The ventral 'perceptual' stream projecting from the primary visual cortex to the temporal lobe provides the rich and detailed representation of the world required for cognitive operations.

This might sound rather like Cartesian dualism—the existence of a conscious mind separate from a reflexive machine. But the division of labour between the two streams has nothing to do with the kind of dualism that Descartes proposed. Although the two kinds of visual processing are separate, both are embodied in the hardware of the brain. Moreover, there is a complex but seamless interaction between the ventral and the dorsal streams in the production of adaptive behavior. The selection of appropriate goal objects depends on the perceptual machinery of the ventral stream, while the execution of a goal-directed action is mediated by dedicated on-line control systems in the dorsal stream and associated motor areas. Moreover, as I will argue, the integration of processing in the two streams goes well beyond this. The dorsal stream may allow us to reach out and grasp objects with exquisite ease, but it is trapped in the present. Evidence from the behaviour of both neurological patients and normal observers shows that, by itself, the dorsal stream can deal only with objects that are visible when the action is being programmed. The ventral stream, however, allows us to escape the present and bring to bear information from the past – including information about the function of objects, their intrinsic properties, and their location with reference to other objects in the world. Ultimately then, both streams contribute to the production of goal-directed actions.

References:

Goodale, M.A. & Milner, A.D. (2004). *Sight Unseen: An Exploration of Conscious and Unconscious Vision.* Oxford, UK: Oxford University Press. 135pp.

Goodale, M.A. & Westwood, D.A. (2004). An evolving view of duplex vision: Separate but interacting cortical pathways for perception and action. *Current Opinion in Neurobiology* **14**:203-211.