

- [Home](#)
- [About the CVR](#)
- [News](#)
- [Members](#)
- [Seminar Series](#)
- [Conference](#)
- [Resources](#)
- [CVR Summer School](#)
- [Research Labs](#)
- [Training at the CVR](#)
- [Partnering with the CVR](#)
- [Contact Us](#)

- Friday, October 8, 2010

Scratching beneath the surface: new insights into the functional properties of the lateral occipital area and parahippocampal place area

With the advent of fMRI, a number of researchers have provided compelling evidence that the visual system is organized in a modular fashion, with certain areas of occipito-temporal cortex being specialized for processing one specific type of visual category (e.g. faces in the FFA, objects in area LO, and scenes in the PPA). During my talk, I do not dispute the notion of category selectivity as a potential organizing principle in the visual system, but instead shift the focus from the processing of single categories of stimuli in the ventral stream to the processing of particular features of objects. In doing so, I focus on area LO and the PPA and present results which demonstrate the existence of different neural substrates for the different types of information that a visual surface signals. I present evidence that area LO is highly sensitive to processing object shape, and suggest that the organization of this region may be complex, with neurons tuned not only to the outline shape of single objects, but also to their surface curvature independent of contour. Moreover, I present results demonstrating that area LO is also sensitive to extracting shape information out of more cluttered and ecologically valid visual images (i.e. ensembles of multiple objects). In addition, I present evidence that processing surface texture, which occurs within the scene-sensitive PPA, is a route to accessing knowledge about an object's material properties (i.e. whether an object has a hard or soft compliance). Finally, I discuss findings which demonstrate that, in addition to processing visual texture and material properties, the PPA is involved in representing ensemble statistics from large collections of objects (e.g. leaves on a tree). This suggests that the PPA may contribute to scene representation by extracting ensemble statistics, texture features and material information in addition to the 3D layout of a scene. With this in mind, I propose that models of visual cortical organization should focus not only on the particular stimulus category to which a region responds (e.g. objects, scenes), but also on the stimulus attributes that best support the processing of that category (e.g. shape, texture, material properties, object ensemble statistics).

Jonathan S. Cant
Harvard University