A Data-Driven Method for Investigating Cortical Functional Organization

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Presentation Abstract Summary We describe a novel cortical parcellation method that identifies regions with coherent functional response profiles, 'grouping by response similarity' (GRS). The algorithm does not require assumptions about stimulus properties, spatial relationships, or response uniformity. From fMRI responses to naturalistic videos in the human ventral temporal cortex, GRS finds discrete patches on the cortical surface with distinct functional response profiles. These regions show consistent boundaries across different stimulus sets, demonstrating that parcellation is not stimulus specific. Subsets of these regions correspond to the previously identified category-selective areas. Thus, grouping by response similarity provides a powerful exploratory analysis method for studying cortical organization in regions of cortex where functional roles are not yet clearly known.

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