Robustness to image clutter in human visual cortex

Gabriel Kreiman [1,2,3],

Yigal Agam[4],

Hesheng Liu[5],

Calin Buia[6],

Alexander Papanastassiou[7],

Alexandra Golby[8] **and**

Joseph Madsen[9]

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[+] Author Affiliations

Abstract

Visual recognition in natural scenes operates in the presence of multiple objects, background and occlusion. How the neural representation of images containing isolated objects extrapolates to cluttered images remains unclear. The responses of neurons along the monkey ventral visual cortex to cluttered images show varying degrees of suppressive effects. Attention could alleviate suppression by enhancing responses to specific features or locations. Yet, it seems difficult to account for the accurate and fast recognition capacity of primates exclusively by serial attentional shifts. Here we recorded intracranial field potentials from 672 electrodes in human visual cortex while subjects were presented with 100 ms flashes of images containing either one or two objects. We could rapidly and accurately read out information about objects in single trials in cluttered images from the physiological responses. These observations could account for human fast recognition performance and are compatible with simple hierarchical architectures proposed for immediate recognition.

Footnotes

Articles citing this article

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