

UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

Contribution of receptive field center and surround to repetition suppression in macaque visual area V2

Permalink

<https://escholarship.org/uc/item/27n5z45t>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 43(43)

Authors

Williams, Nathaniel

Olson, Carl

Publication Date

2021

Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed

Contribution of receptive field center and surround to repetition suppression in macaque visual area V2

Nathaniel Williams

Carnegie Mellon University, Pittsburgh, Pennsylvania, United States

Carl Olson

Carnegie Mellon University, Pittsburgh, Pennsylvania, United States

Abstract

Primate inferotemporal cortex (ITC) neurons respond with declining strength to repeated presentations of large natural images. This phenomenon - repetition suppression - has been assumed to arise at the level of ITC because ITC neurons possess the large receptive fields and sophisticated selectivity to recognize images as repetitions. It was recently discovered that V2 neurons exhibit repetition suppression under identical conditions. How do V2 neurons, with classical receptive fields encompassing only a small fraction of the image, recognize it as a repetition? One possibility is that they are sensitive to repetition of content outside the classical receptive field, in the surround. To assess this, we recorded neuronal responses to displays while independently controlling repetition of elements in the classical receptive field and the surround. We found that content in the surround contributed to repetition suppression and that this occurred relatively late in the response, consistent with being mediated by feedback.