

Readings in Neuroinformatics

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Hubel, David H & Torsten N Wiesel. 1968. Receptive fields and functional architecture of monkey striate cortex. *The Journal of physiology* 195(1). 215–243.

Abstract

To process visual information, there needs to be a mechanism integrating separate light stimuli into one visual experience. After having studied the involved functions in the cat visual pathway, the question remains as to how these insights can be extended to the human visual system. With visual capabilities very similar to human's especially in acuity and color vision, we chose to perform new experiments in the monkey striate cortex where we introduced electrodes at various cortical sites under light anesthesia. With seven penetrations in six spider monkeys, we performed a series of recordings from 150 cells, and another from 272 cells with 25 penetrations in 16 macaque monkeys. From the response patterns to various light stimuli, we were able to distinguish between three cell types and their prevalence at different cortical layers; *simple cells*, sensitive to light stimuli with a particular 'on' and 'off' areas, *complex cells*, most sensitive to particular orientations of a light bar on any part of their receptive field, as well as *hypercomplex cells*, sensitive to both the particular shape and orientation of a light bar. We also found that most cells were binocularly driven and most weren't color sensitive. These findings suggest that in the striate cortex the input from the two eyes converges into single cells and increasingly complex fields are elaborated from geniculate concentric fields. Now, further examinations about later stages of information integration can be made for a more complete model of the human visual pathway.

249 words.