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# A Mean Field Theory of Layer IV of Visual Cortex and Its Application to Artificial Neural Networks

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## Abstract:

A single cell theory for the development of selectivity and ocular dominance in visual cortex has been presented previously by

Bienenstock, Cooper and Munro. This has been extended to a network applicable to layer IV of visual cortex<sup>2</sup>. In

this paper we present a mean field approximation that captures in a fairly transparent manner the quantitative, results of the

network theory. Finally, we consider the application of this theory to artificial neural networks and show that a significant reduction

in architectural complexity is possible. the qualitative,

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