

THE ROLE OF CORRELATED FIRING IN CODING INFORMATION ABOUT SINGLE AND SEPARATE OBJECTS IN CAT V1

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It has been suggested that the synchronized activity between groups of neurons signal that they are responding to the same object. Evidence from visual cortex is still highly controversial. In particular, it is not yet clear what percentage of cells synchronize according to the predictions of the binding-by-synchrony theory. Also, it is not clear if synchrony is a reliable enough mechanism for coding object configuration. To address these issues, we recorded from approximately 200 pairs of cells in the V1 cortex of anaesthetized cats while presenting 0, 1 or 2 objects. We quantified how much information about stimulus configuration is contributed by independent rate modulations, and how much information is contained in the synchronous firing. We found that synchronous firing generally carried little information (compared to mean firing rates) about these visual stimulus configurations. This suggests that synchrony and spike timing correlations are much less important than firing rates of individual neurons in neuronal population coding. A preliminary version of the results has been reported in [1].

References

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