

Poster presentation

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## Spatial attention in V4: a biophysical model

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It has been shown that directing attention towards a location inside the receptive field of a V4 neuron induces an increase in the stimulus response of the neuron, in the local field potential power within the gamma frequency range and also an increase of phase-locking. When two stimuli are presented in the receptive field of the same neuron, the two compete and the neuron's response is in between the responses to each stimulus presented alone. Attention to the location of one of the stimuli is found to bias this competition, favouring this stimulus. The top down attentional signal presumably comes from prefrontal areas. In one of these areas, the frontal eye field, the neural activity has been shown to be linked with the activity in V4 and to be able to induce the attentional effects seen in V4. Despite these experimental results, the basic mechanisms underlying competition and attention are still not well understood.

We introduce a biophysical model of V4 to study this problem. The model consists on a network of pyramidal neurons and interneurons, connected via realistic synapses and receiving stimulus inputs from area V2 and feedback attentional inputs. We study parameters roles (like the synaptic conductances) on the network dynamics and find values for which the in vivo type of dynamics is reproduced. In presence of two stimuli, the model results show that they compete. Applying an attentional signal towards one stimulus is found to induce the observed attentional effects. Interneurons are found to play an important role in both phenomena. These network results

extend our previous conclusions regarding competition and attention but which were at the neuronal level.