for these features are however already

Such features are also spatially grouped together in the primary visual cortex. Neurons tuned to the same orientation are grouped together in orientation columns. On and off neurons and ocular dominance have also shown to be arranged in columns in V1. While most models of feature selectivity aim to explain either the mechanism underlying feature selectivity or their organisation in V1, few endeavour to explain both.

established in the

Similarly, if a small number of broadly tuned orientation channels are established in the retina, the weights of inputs from the different channels can be used to generate the full gamut of orientations observed in the cortex. The broad orientation biases can also be sharpened in the cortex through intracortical mechanisms. Therefore, we hypothesise that orientation selectivity in V1 too arises from a small number of broadly tuned channels in the retina.

Vidyasagar and Eysel (2015) suggested that both sharp orientation selecitivty and the organization of orientation selectivity in the cortex can arise from a small number of broadly tuned orientation channels in the retina.

Perception of spatial vision does not solely involve the orientation of neurons; the spatial frequency tuning of neurons also plays and important role. Further, interactions between the orientation and spatial frequency of a stimulus and the organisation of the receptive field sub-divisions also takes place. **A secondary aim of this thesis was to examine the interactions between the orientation selectivity, spatial frequency tuning and the linearity of spatial summation of neurons.**