

1 b)

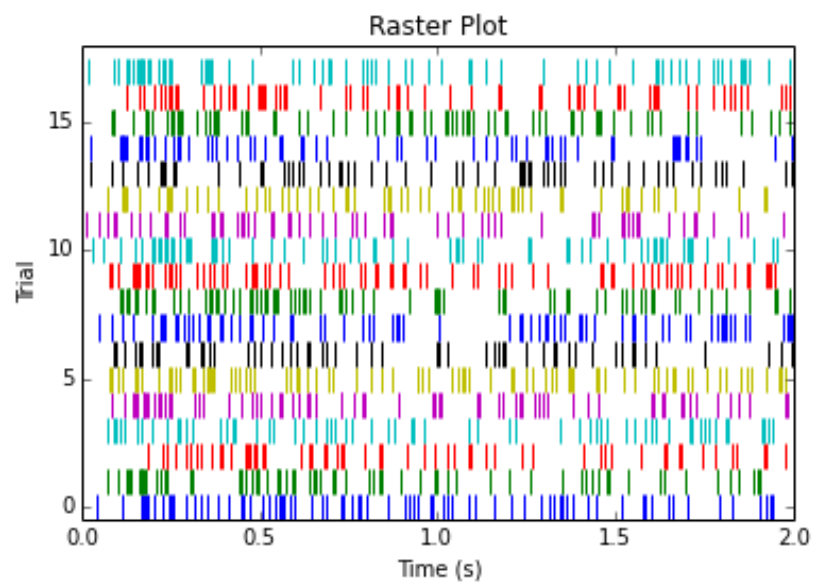


Figure 1: Spike Raster plot of a single neurons over 18 trials.

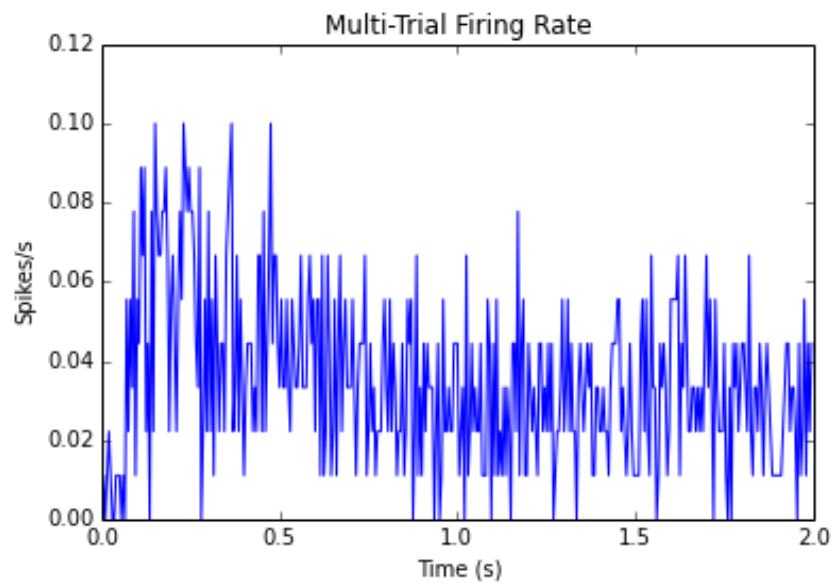


Figure 2: Average multi-trial firing rate of a single neuron over 18 trials.

1 c)

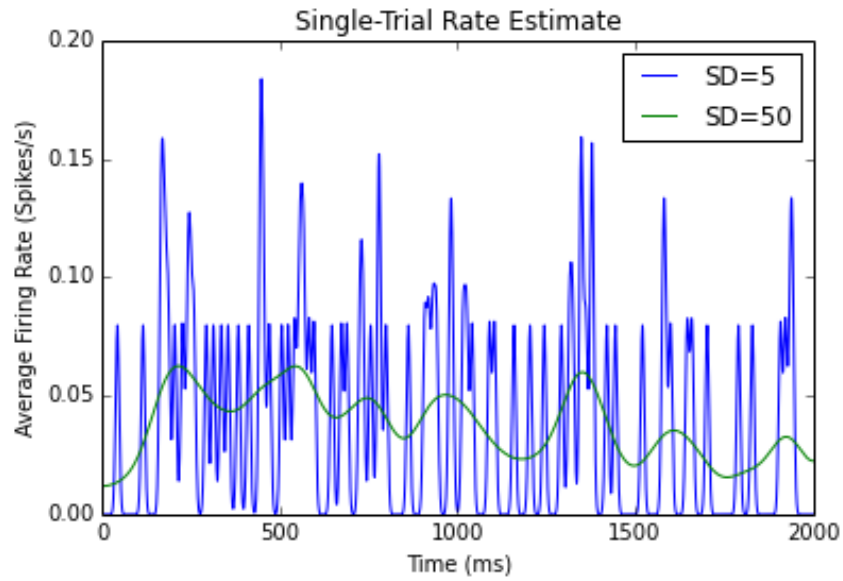


Figure 3: Single trial spiking rate estimate calculated by convolving the spikes (approximated by delta functions) with a Gaussian kernel. This figure contrasts two kernels with different standard deviations.

1 d)

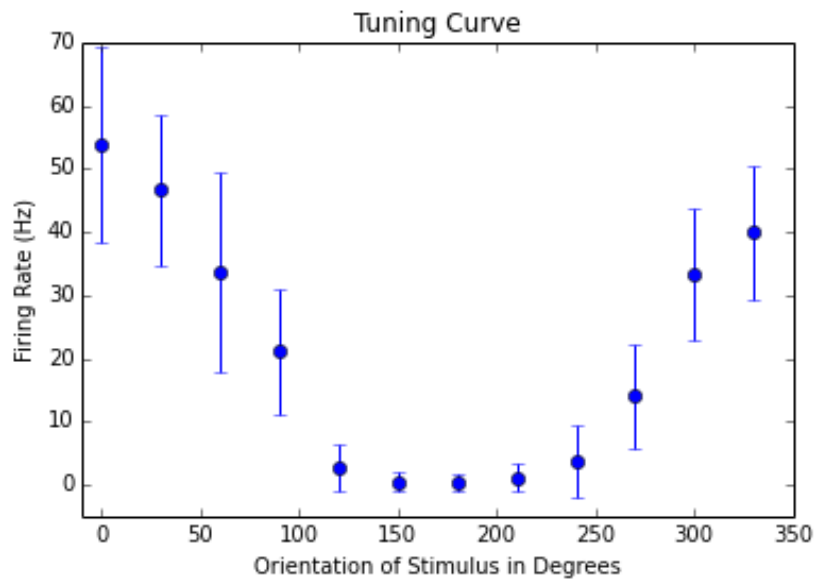


Figure 4: Mean firing rate of neuron in response to stimuli of various orientations. Error bars are standard deviations.

1 e)

Figure 5 is a mouse neuron tuning curve taken from Jeyabalaratnam et al. 2013, showing how a mouse's primary visual cortex neurons adapt to input. Specifically, when shown an input of 45 degrees for 12 minutes, the neuron that was originally tuned for 0 degrees (blue lines) became significantly more responsive to 45 degrees (pink lines), before settling back to the 0 degrees again (blue lines) after 60 minutes of recovery. Also, note the increase in responsiveness (higher peaks) as a result of the adaptation.

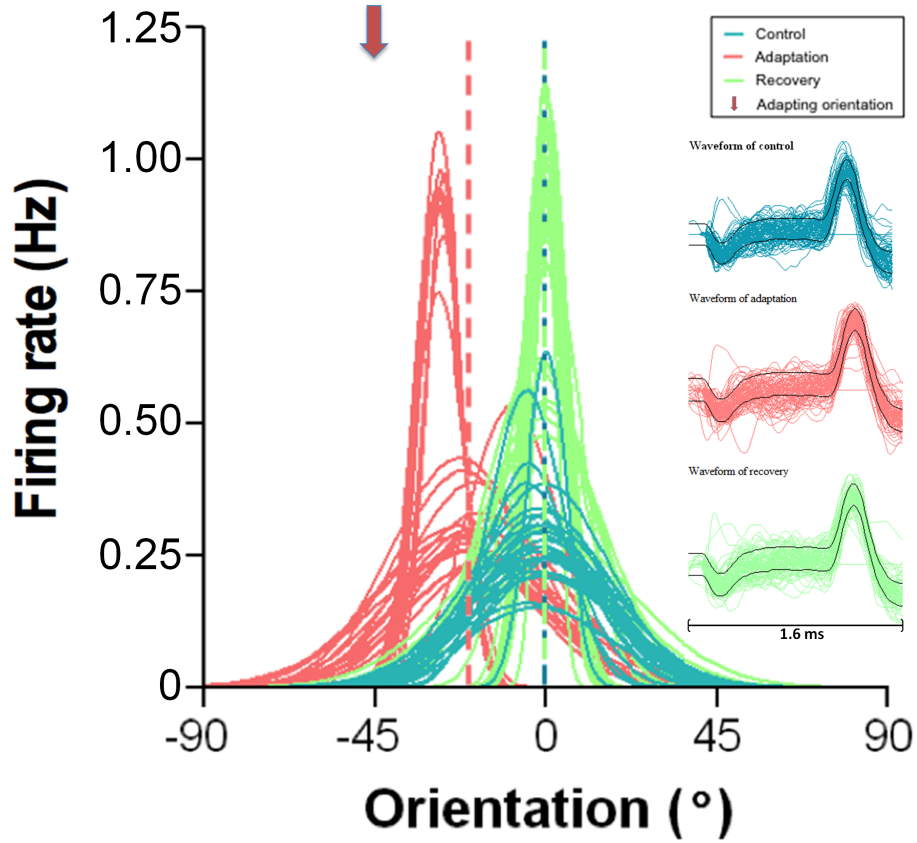


Figure 5: Adaptation of mouse primary visual cortex.

2 b)

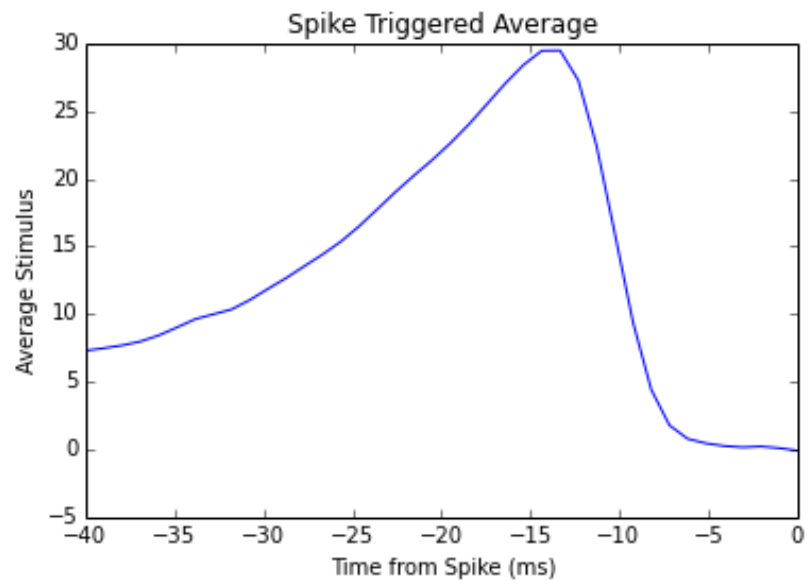


Figure 6: Spike triggered average using a window of 40 ms.

2 c)

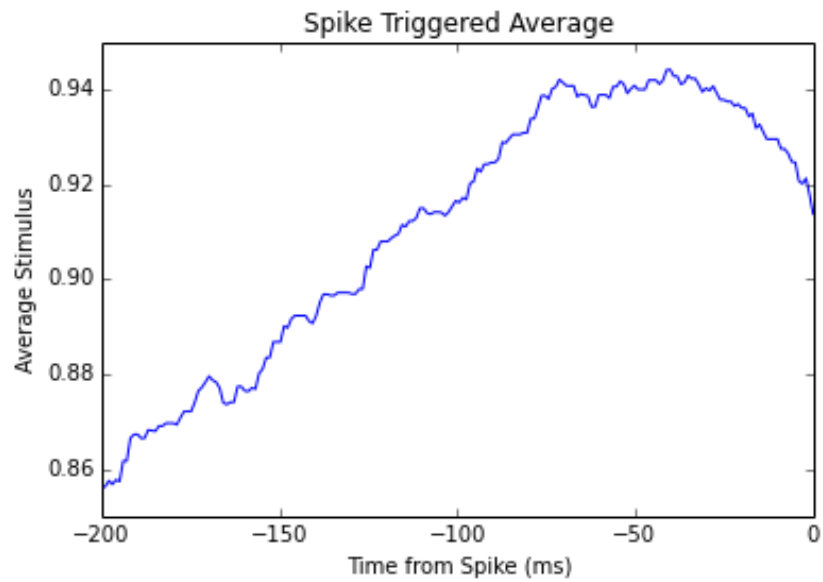


Figure 7: Spike triggered average in response to white noise with a window of 200ms.

2 d)

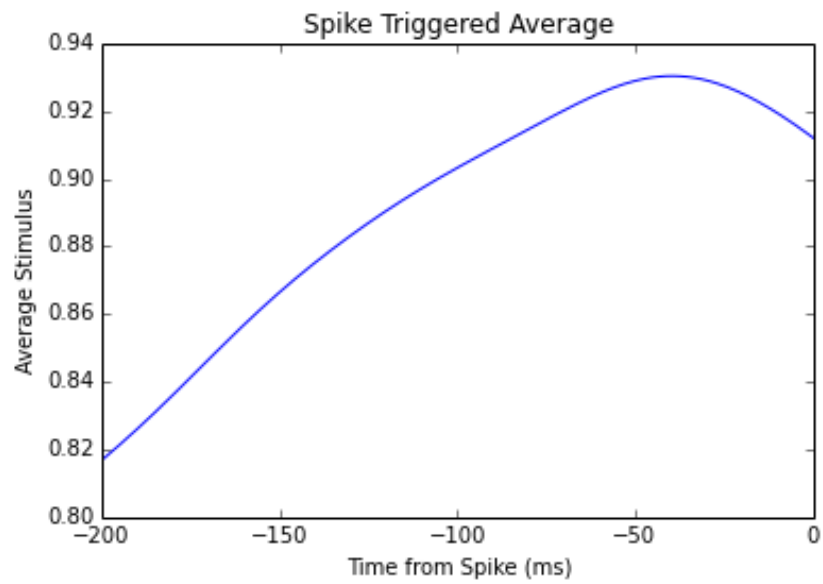


Figure 8: Spike triggered average in response to white noise smoothed with a Gaussian kernel.

This response is different because rather than the average of the input before the spike being a bunch of discrete values, they are instead smoothed, thus leading to a smoother average.