**People involved**: Catrina Hacker

**Short abstract**: Most visual neuroscience studies involve recording the responses of visually selective neurons to single carefully curated stimuli. However, natural vision involves the presentation of many such stimuli that must be simultaneously represented. Caruso et al. found that neurons in inferior colliculus and the macaque face patch multiplex by stochastically switching between representations of each of two simultaneously presented stimuli (auditory or visual). The implications of this temporal multiplexing on the interpretability of population codes in visual cortex is not understood. I plan to simulate the responses of a population of neurons to the presentation of two separate stimuli and then to simulate this temporal multiplexing signal using the poisson models tested in Caruso et al.. Using this simulated population, I plan to use linear decoders to explore whether and how often one or the other stimulus is easily decoded from the multiplexed population response. If possible, I will also try to incorporate the findings of Jun et al. that there are systematic changes in the structure of the noise correlations across V1 and V4 depending on the tuning of pairs of neurons and to account for the implications of these results.

**PIs that are relevant**: Jennifer Groh, Marlene Cohen