To run the matlab code there needs to be a file fignum.txt in the same directory as the code bulbpiri_fig6.m and a subdirectory called Saved_Research. During theinitialization of the code it makes a new subdirectory within Saved_Research that is labeled with a consecutive number based on the value in fignum.txt and the current date and time. All figures are saved there.

The different cases corresponding to the various figures are controled with the variables learning_case and probe_case. The correspondence with the key figures is as follows

- Fig.3: learning_case=8

- Fig.5: learning_case=6

- Fig.6: learning_case=13

- Fig.7: learning_case=7

Note: in the uploaded code there may be slight variations of the parameters for Figs.3,5,7 compared to those used in the publication.

In the uploaded code the parameter number_GC_aim_final was set to 500 to speed up the computations. To reduce the fluctutions in the connectivities that number should be raised to the values given in the publication. The temporal evolution is relatively slow. To get a reasonable impression of the resulting connectivities and activities one has to run the code for at least 40,000 steps. In the code this corresponds to setting outer_param_step=400.

Brief description of the output figures:

- Figure 3 shows the activity of the GC with recifier (left panel) for the training stimuli. The second and third panel shows the contributions to the GC activity from bulbar and cortical input, respectively. Panel 4 shows the pattern correlation between the GC activities for the training stimuli.

- Figure 5 shows the cortical connectivity W_{cc} as well as the activity of CC without and with sigmoid.

- Figure 16 shows the effective disynaptic inhibition W_{MM} and W_{MC}.

- Figure 17 shows the CC and MC activities for the training stimuli.

- Figure 18: The top 2 panels show the correlations between stimulus pair 1,2 and stimulus pair 3,4 as well as the corresponding Fisher discriminants as a function of time. Panel 3 shows the contributions of each MC to the Fisher discriminants. Panels 4,5 show the MC acvtivity without and with rectifier.

- Figure 19: like Figure 18, but without cortical input.

- Figure 80: Top left and bottom left panels show the MC and CC activities for the probe stimuli shown in the top right panel. For each stimulus the activities are shown without context and with contexts 1 and 2. The bottom right panel shows the same MC activities but as line plots rather than heat maps.

- Figure 81 shows the results corresponding to Figure 80 in the absence of cortical inputs.

- Figure 1018 shows the temporal evolution of the Fisher discriminant for random read-out as a function of time.

- Figure 1019 shows the results corresponding to Figure 1018 in the absence of cortical inputs.