Read Me - Behavior Responses

1 Goal of the script

The goal of this script is to select 3 events related to neuronal activity of one specific sub-type of neuron and to create summary videos highlighting 3 events per fly for 3 different flies.

2 Setup of the Environment

This script was run on Python 2.7.10 and used the following libraries :

- Numpy (v 1.13.1)
- Matplotlib (v 1.3.1)
- cPickle (v 1.71)
- PIL (v 4.2.1)

3 Folder Organisation

The dictionary computed from the P4 script and the behavior_imgs directory should be present in the experiment directory to compute this script. Please refer to the read me file created for the ROI selection program if more information is needed on folder organisation.

4 Running the Script

The user needs to set 4 parameters :

- the « outFigDir » path which is the path of the folder where the images to compute the movies will be stored
- the paths to the experiments that should be used to find the 9 events
- the SelectChoice parameter that should be set to 1 for A1 neurons, 2 for MAN and 3 for MDN
- the LeftChoice parameter that should be set only if events for A1 neurons are being analysed. The LeftChoice should be set to 1 if events detection are related to left A1 neuron and to 0 for right A1 neuron.

The script can be run once those parameters are set.

5 Partly Detailed Explanations

Events detection was performed as previously described in the Event Detection Read Me file. The find3EventsMDNMAN() function or find3EventsA1() function is used to select 3 events based on the detected events that have a special criteria on optic flow data. The find3EventsMDNMAN() detects events that have the minimum AP value in a 2 seconds window after the time point of the event for MDN or events that have the maximum difference in AP between the maximum value of AP in a time window of 1 second before the event and the minimum AP value in a time window of 2 seconds after the event time point. The find3EventsA1() function selects events from A1 neurons that have the maximum (respectively minimum) Yaw value for left A1 neuron (respectively right A1 neuron) in a two seconds time window after the event time point. Once those events are selected, the corresponding indexes of the behavior frames that need to be selected are stored to plot in the final movies. 3 seconds of behavior frames are plotted for each event (1 second before the event time point to two seconds after).