Goris, Movshon & Simoncelli

This folder contains both monkey V1 data and model code.

There are two data-files: '*exampleCell*', which contains a recording of a single unit in an anesthetized animal during stimulation with gratings drifting in different directions, and '*examplePopulation*' which contains responses of 6 simultaneously recorded units during a similar experiment. The second data-set is a subset of a larger population recording first reported in Graf et al. (2011). The selected units and pairs of units are representative of the different response variance and covariance behaviors discussed in Goris et al. (2014).

There are two model-scripts: '*fitModPoissModel*'

```
% [stats] = fitModPoissModel(unitName, varargin) fits the modulated Poisson
%      model presented in Goris, Movshon & Simoncelli (2014) to spike count
%      data.
%
%   Input
%   unitName is a string specifying the label of a single unit.
%   fitModPoissModel(unitName, 'loadPath', path) specifies the directory
%   from which to load data files. Default is the current directory.
%
%   Output
%   Stats is a structure with subfields exp and fit
%   exp.stimValue --- all unique stimulus values
%   exp.stimResp  --- mean response rates, one for every condition
%   exp.countMean --- spike count mean
%   exp.countvar  --- spike count variance
%   exp.countCorr --- spike count correlation
%
%   fit.sigG2     --- variance of the gain
%   fit.NLL       --- negative log likelihood of the spike counts
%   fit.cpeNLL    --- cumulative probability estimate of log likelihood
%   fit.SS.stim   --- sum of squares due to stimulus
%   fit.SS.PP     --- sum of squares due to point process
%   fit.SS.gain   --- sum of squares due to gain fluctuations
%   fit.corr.PP   --- estimated point process correlation
%   fit.corr.gain --- estimated gain correlation
%   fit.corr.pred --- predicted correlation for every stimulus condition
```

and '*runAnalysis*'

```
% runAnalysis performs analysis of example spike count data using the
%   modulated Poisson model presented in Goris, Movshon & Simoncelli (2014)
%   It requires the following files to be located in the same folder:
%   'exampleCell.mat', 'examplePopulation.mat', 'fitModPoissModel'
```