Data sets provided by Prof. Butts:

RGCsimdata.mat - synthetic data
LGN_FFdata.mat - real data

These data sets have to be in the same folder as codes.

Artificial data and model validation :

GLM_validation
GQM_validation
NIM_validation

These codes produce artificial data (stimulus and number of spikes) for every model using known filters and nonlinearities of my choice, then run models(GLM,GQM,NIM) for these filters. The result of the optimization should be the same as used filters of my choice.

They contain: - simulation function which generates artificial data.
                     - rwg function - calculate negative LL and the respective gradient.
                     - example function - optimization function

Codes:

STA_STC_for_ON_OFF_cells - routine which finds STA and STC filters for RGC data

LNP_STA_realdata - Linear-Non-Linear Poisson model with STA filter for LGN data

LNP_STC_realdata - Linear-Non-Linear Poisson model with STC filters for LGN data

GLM_1st - RGC data set, shows that optimal k filter is STA. Has the following functions:
 rwg function - calculate negative LL and the respective gradient.
 example function - optimization function

GLM_2nd - finds k filter and history filter for LGN data at low resolution. Includes function for optimal lambda choice(lambda_choice). Contains also rwg function and example function.

GQM_1st - routine for GQM. Contains rwg function and example function.

NIM_1st - finds the optimal number of filters and their sign.

NIM_2nd - finds optimal filters for the optimal number of filters.