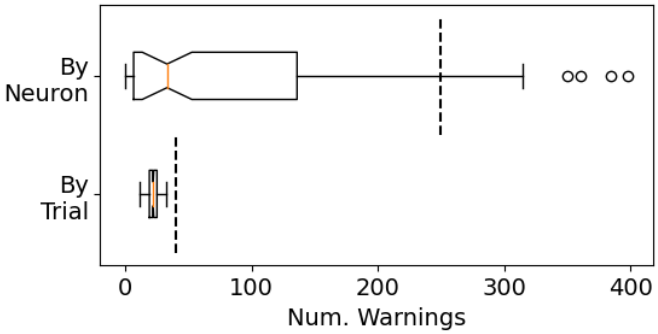
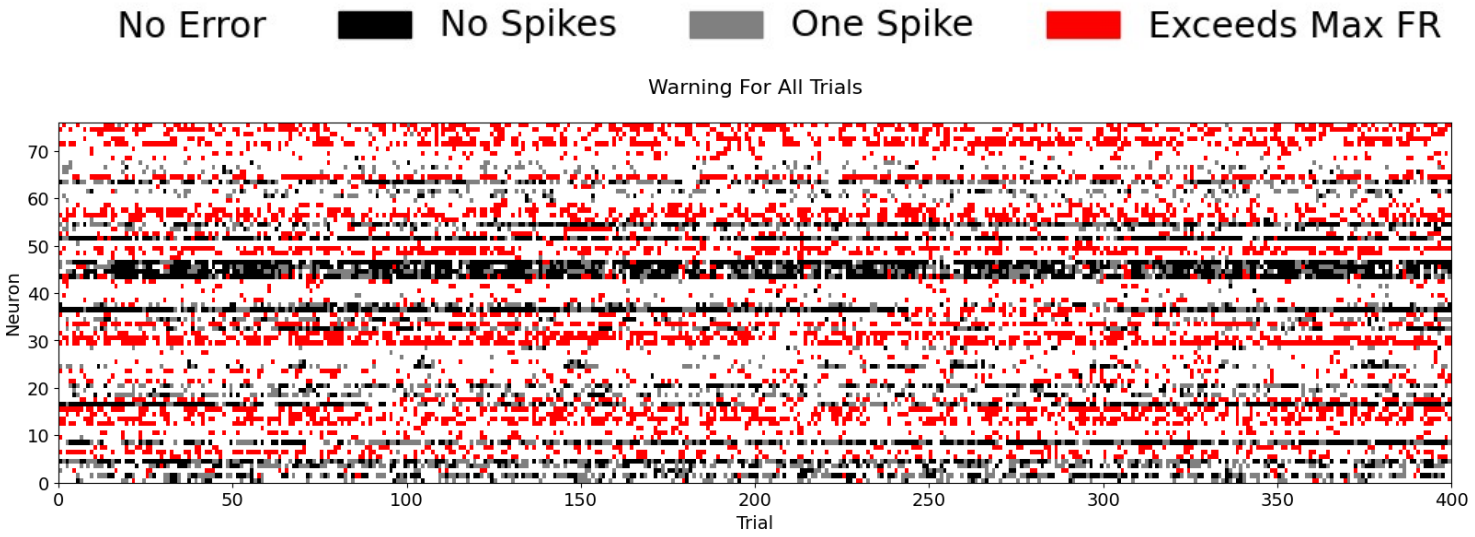
Figures generated by 'decoding_individual_identity.ipynb'

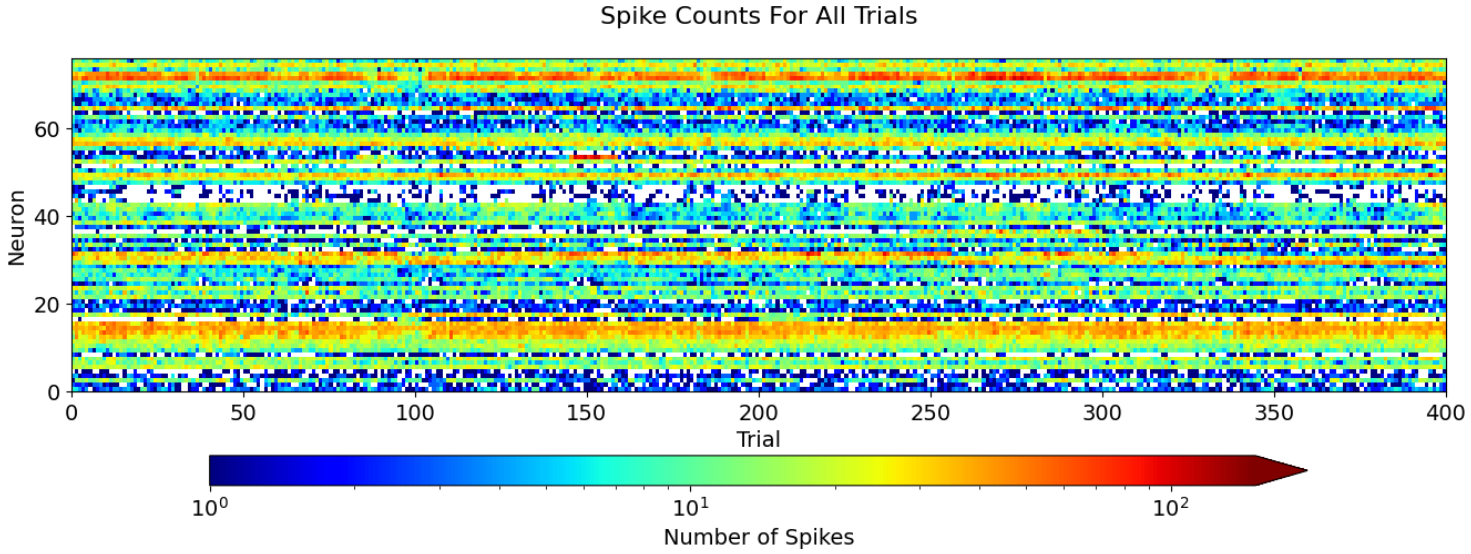
source:
https://github.com/timtyree/tbins.git

Session #46
Whole session plotted

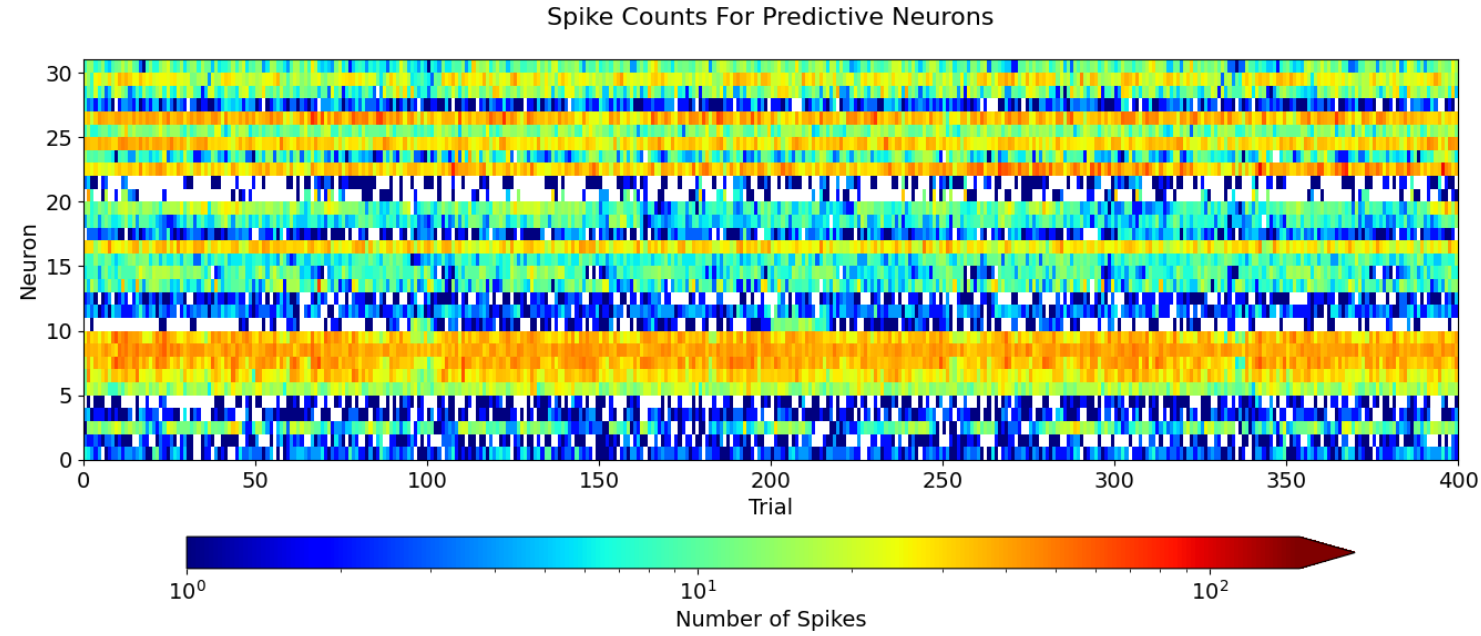


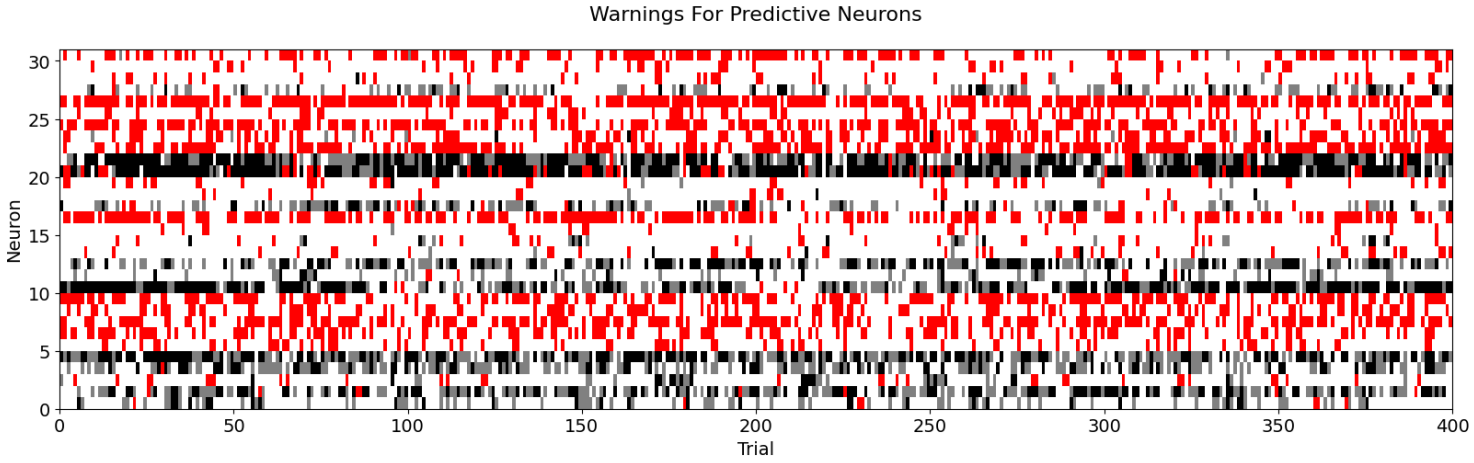
Simple method of removing trials with obvious recording errors. Having >250 trials with (red) warnings lead to the removal of a neuron.



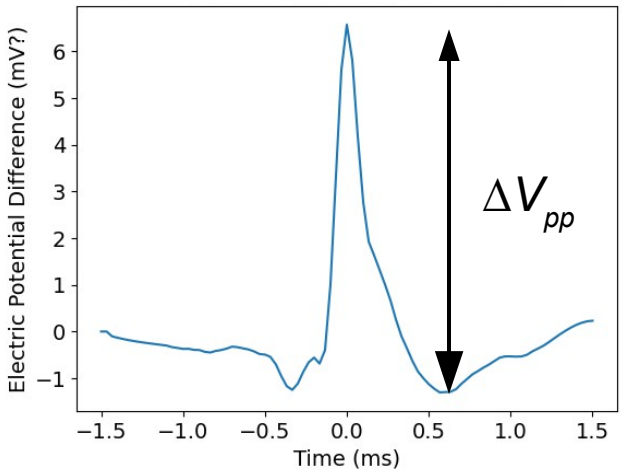


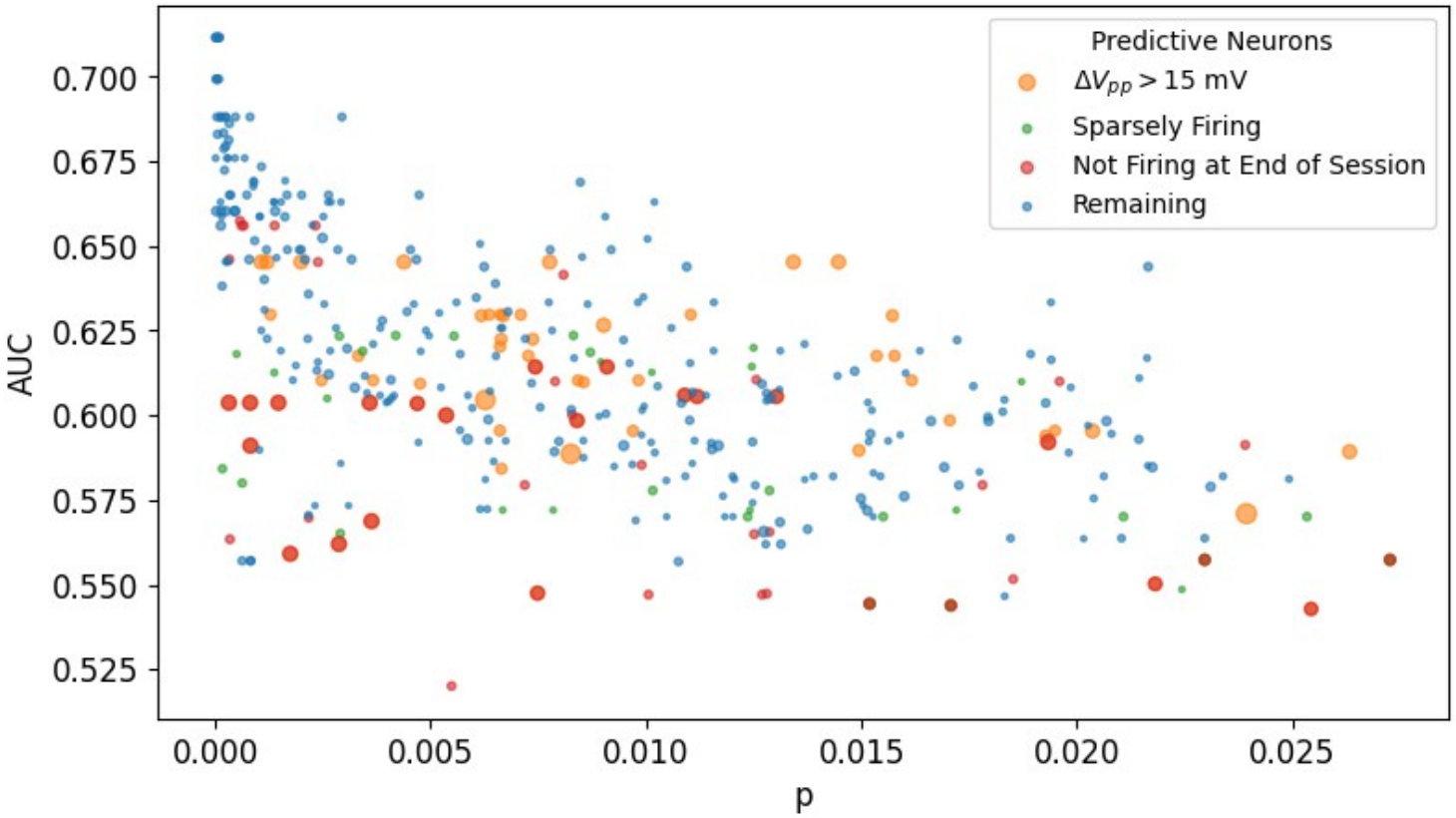
Apparent Predictive Neurons (#46)



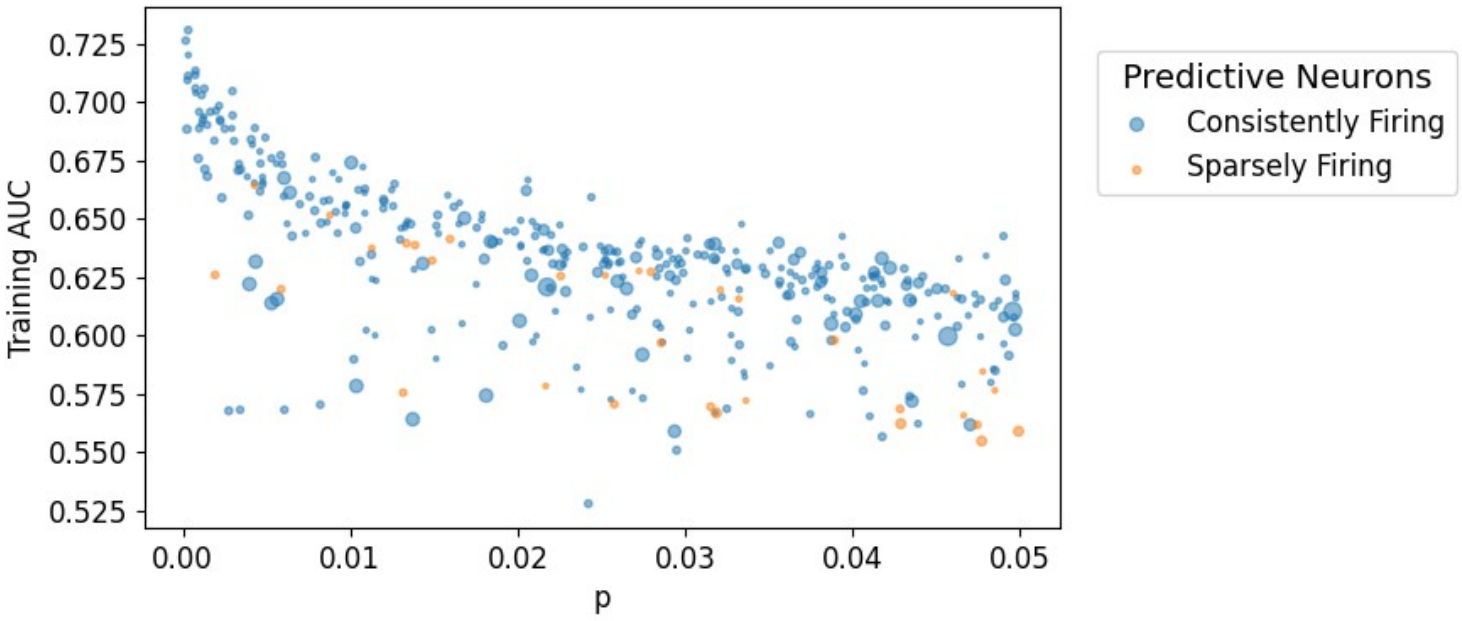


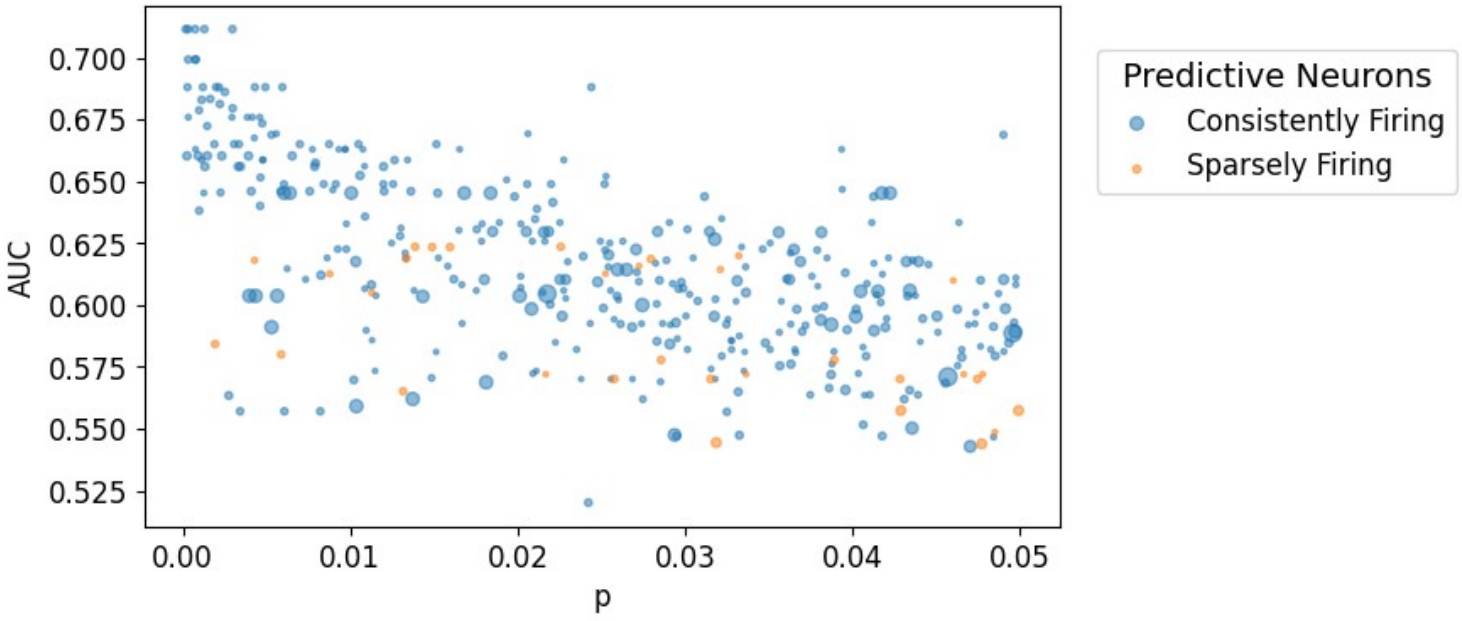
Larger spike amplitudes suggest worse prediction from an apparent predictive time bins (#46)





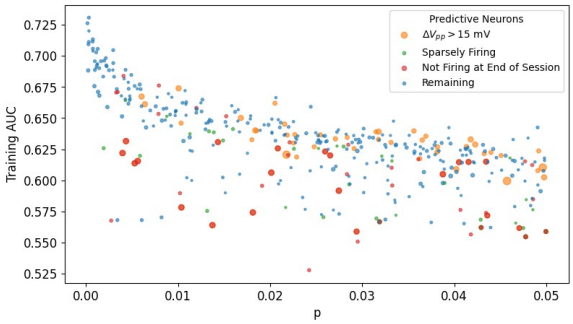
Sparsely firing neurons can be an artifact of a neuron being oversplit during spike sorting (#46).



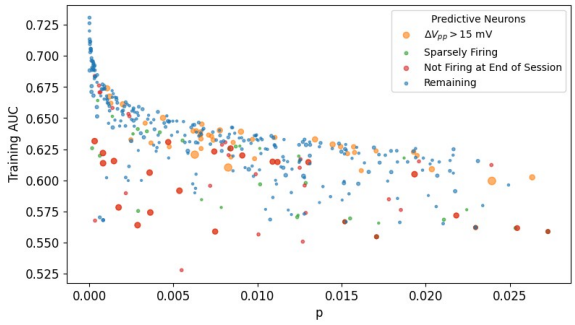


Hades observing the face or voice of her sister, Hermes (#46).

Mean
training *p* value



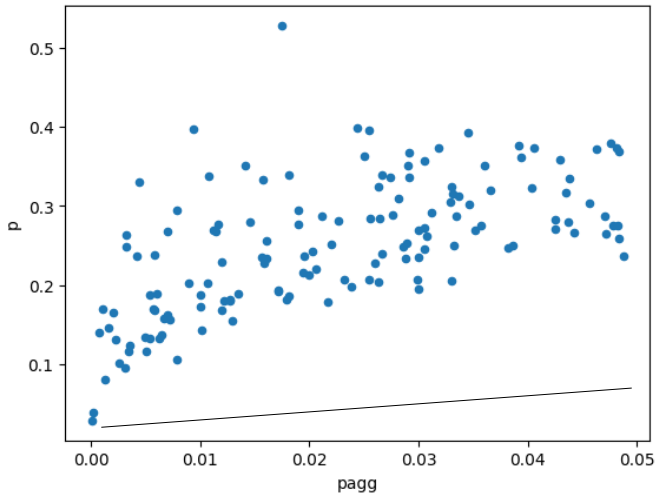
Classic
training p value

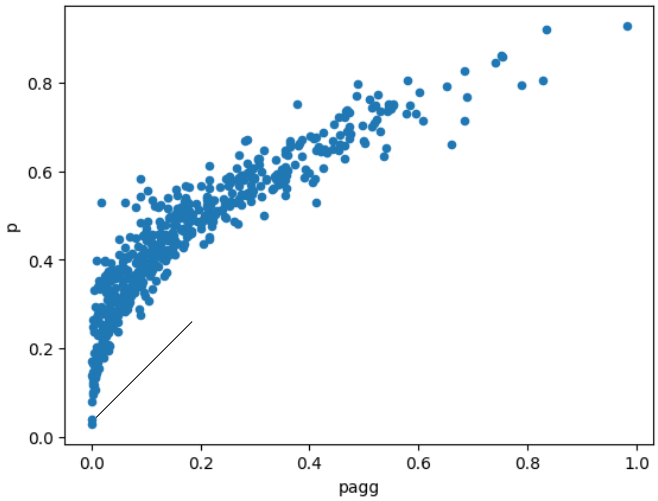


Demonstration that the (y-axis) mean *p*-statistic is sufficient

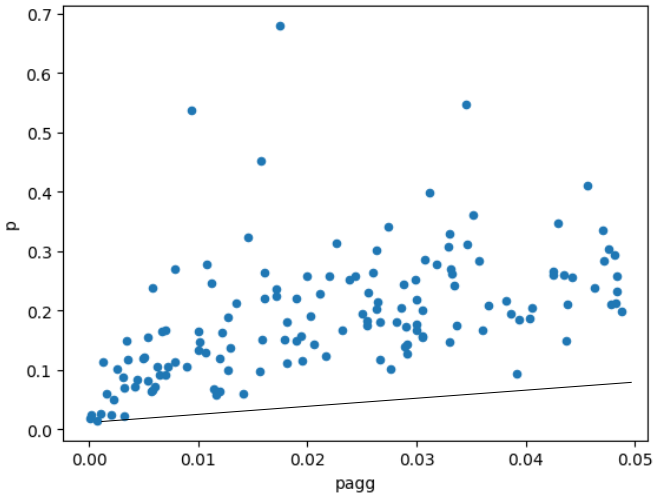
relative to (x-axis) Wilcoxon-Mann-Whitney test
conducted over all of the training trials

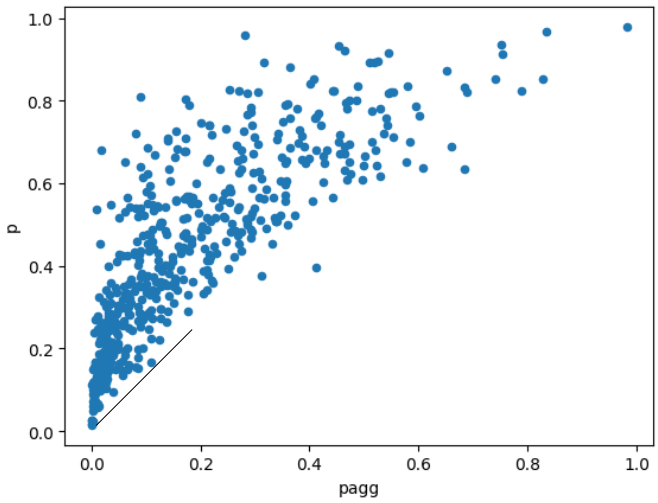
Training p (pagg) versus mean training *p* (*Session #8)*





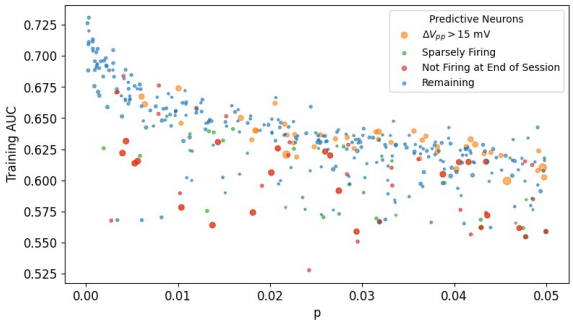
Training p (pagg) versus median training *p* *(Session #8)*



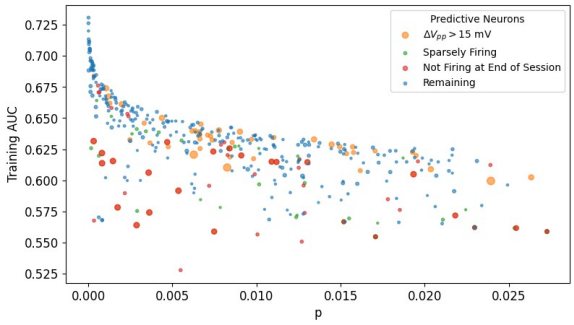


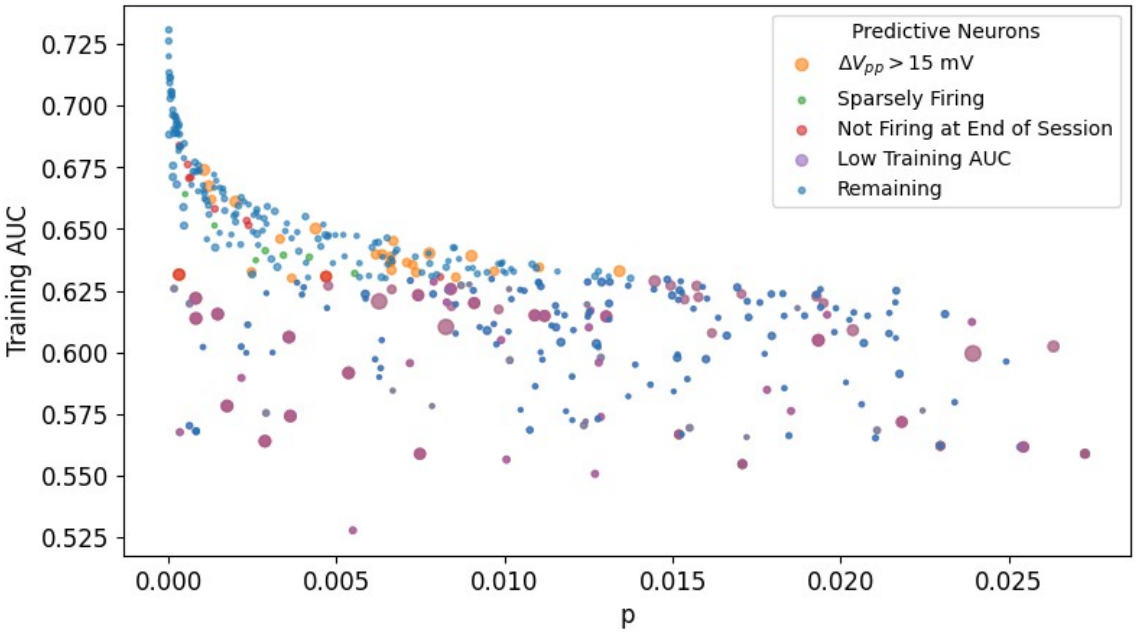
Hades observing the face or voice of her sister, Hermes (#46).

Mean
training *p* value

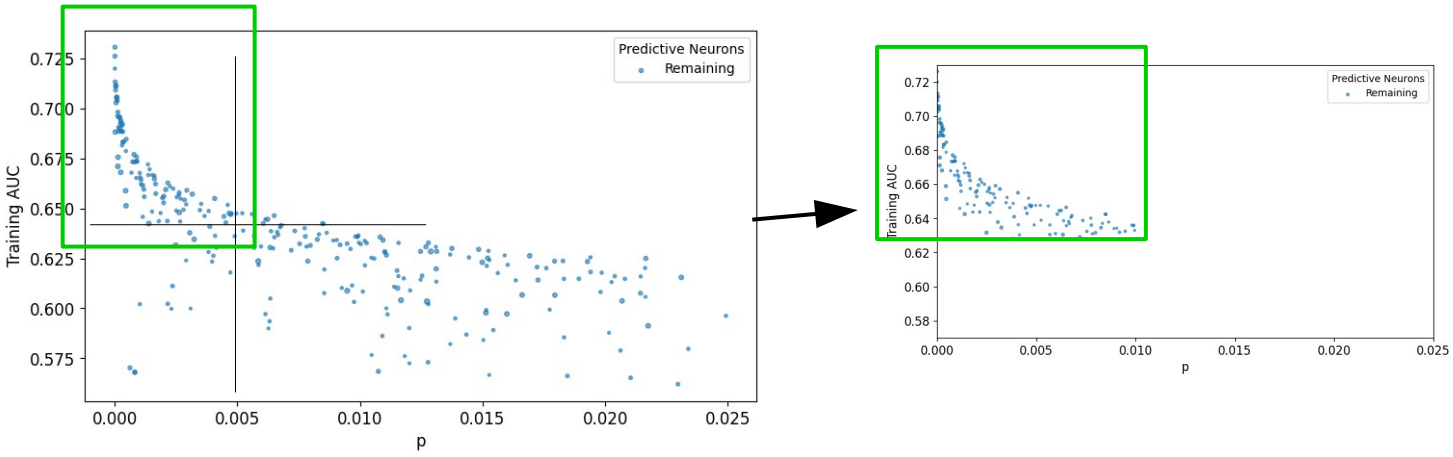


Classic
training p value

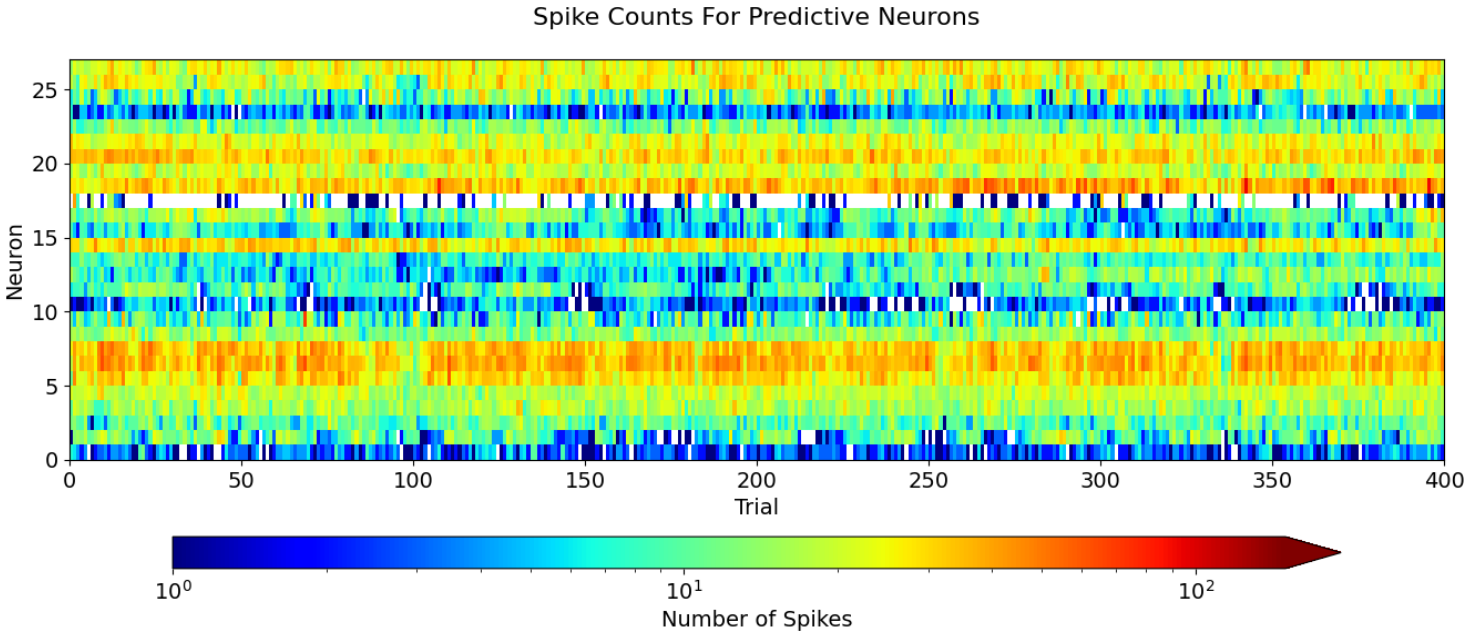


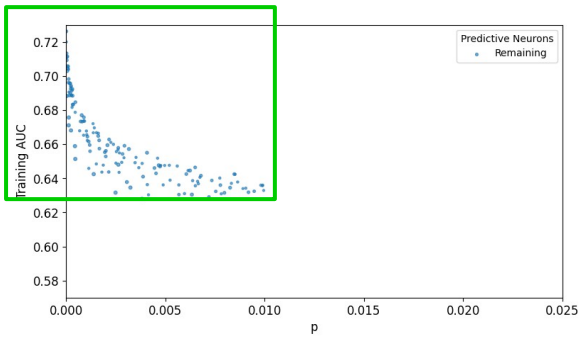


Train and test decoders only with these (green) predictive time bins



Spike counts of Predictive Neurons

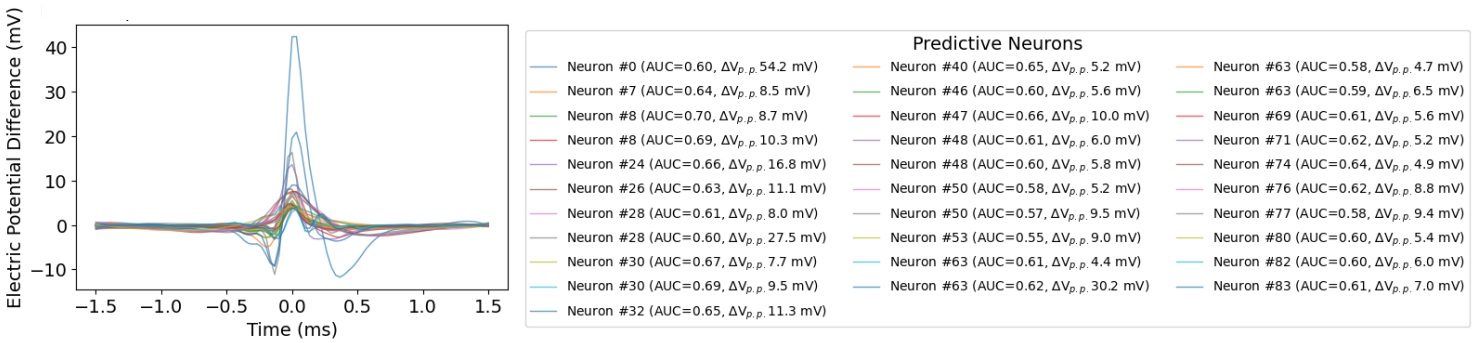




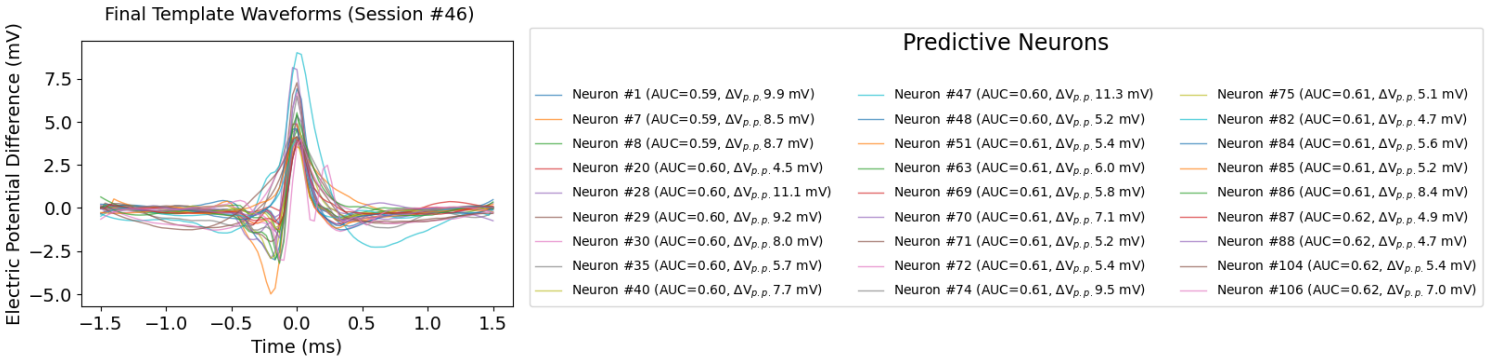
Spike Sorting Templates of predictive neurons before/after filtering (#46)

(note the change in max ΔV_{pp}.)

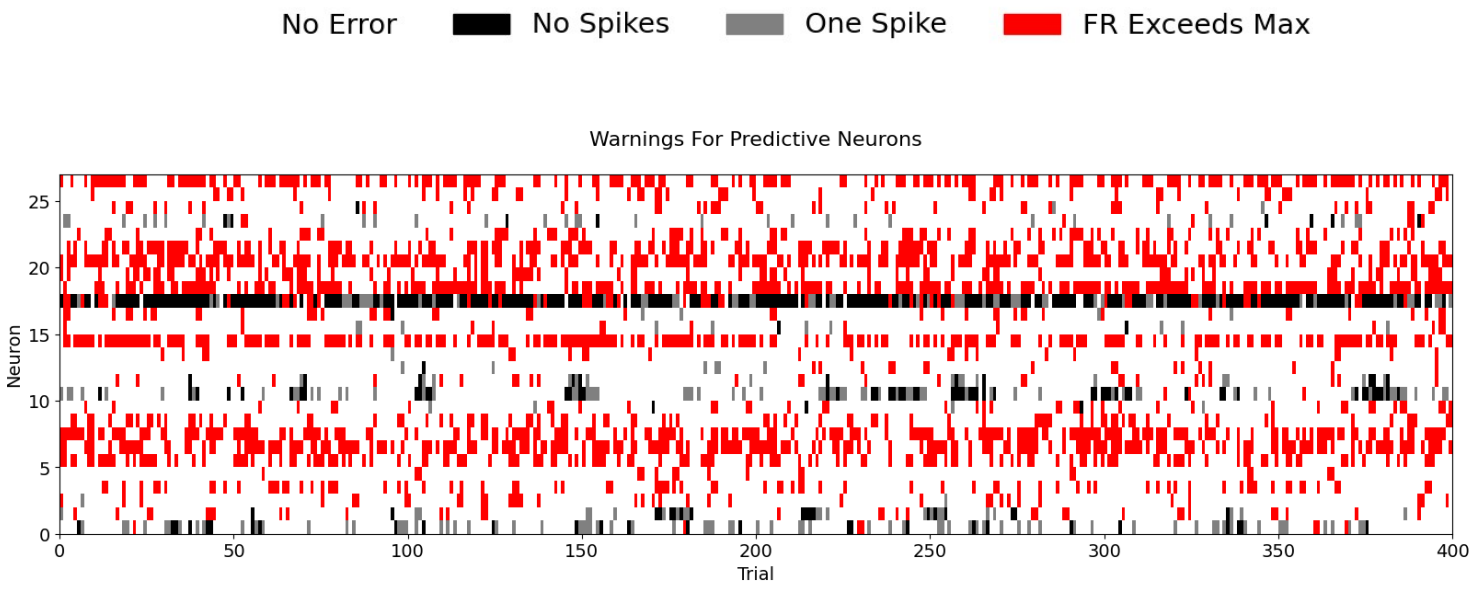
Before filtering predictive time bins



After filtering predictive time bins



After filtering predictive time bins

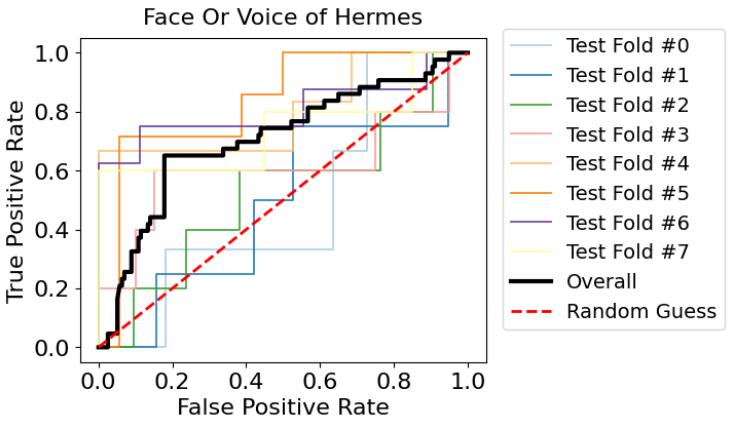


Identity-Specific Decoding of an Individual's Identity

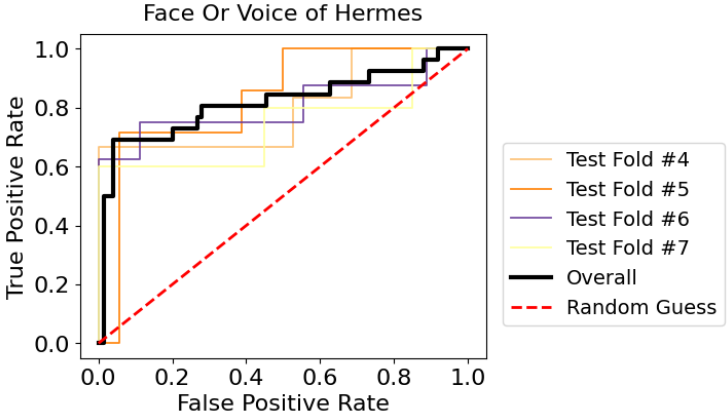
Hades observing the face or voice of her sister, Hermes (#46).

```
predictive population for i_hermes: mean overall auc =  0.6440 +/- 0.0313 (N_pred_tbins=23) ==> AUC=0.4848
predictive population for i_hermes: mean overall auc =  0.6380 +/- 0.0333 (N_pred_tbins=18) ==> AUC=0.4868
predictive population for i_hermes: mean overall auc =  0.6468 +/- 0.0294 (N_pred_tbins=16) ==> AUC=0.5524
predictive population for i_hermes: mean overall auc =  0.6460 +/- 0.0277 (N_pred_tbins=19) ==> AUC=0.6100
predictive population for i_hermes: mean overall auc =  0.6544 +/- 0.0243 (N_pred_tbins=19) ==> AUC=0.7982
predictive population for i_hermes: mean overall auc =  0.6483 +/- 0.0267 (N_pred_tbins=17) ==> AUC=0.8333
predictive population for i_hermes: mean overall auc =  0.6553 +/- 0.0289 (N_pred_tbins=14) ==> AUC=0.8056
predictive population for i_hermes: mean overall auc =  0.6436 +/- 0.0305 (N_pred_tbins=17) ==> AUC=0.8000
tested with mean_num_features=17.8750 for session #46: mean AUC: 0.6714
```

All Testing Folds



All Testing Folds with AUC>0.65




```
i_on_i: AUC: 0.7060, num_trials: 200
    ideal threshold: 0.5000 ==> tpr: 0.6512, fpr: 0.1783
```

```
for fold #4, overall testing auc was auc=0.7982.
for fold #5, overall testing auc was auc=0.8333.
for fold #6, overall testing auc was auc=0.8056.
for fold #7, overall testing auc was auc=0.7400.
i_on_i: AUC: 0.8179, num_trials: 200
    ideal threshold: 0.5000 ==> tpr: 0.6923, fpr: 0.0400
```

Histograms of the predicted probability that the face or voice of Hermes is present

Horizontal bars indicate all misclassifications predicted by a population-level neural decoder that considered all trials.

Perhaps something distinguishes (blue) false positives or (orange) false negatives from the remaining test trials. Different subtypes of responses to modal stimuli could explain why the decoder produced these errors.