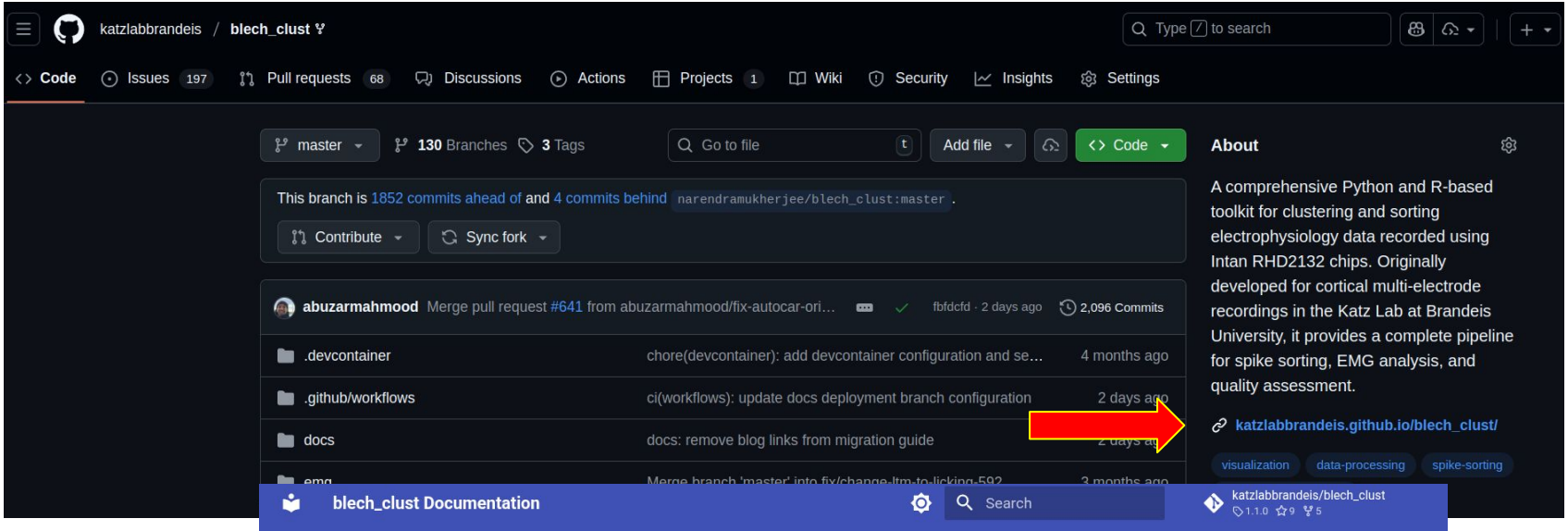
blech_clust

The secrets within
a.k.a.
Some of the lesser known but important features (according to Abu)

As of 1/15/26

Docs + Migration guide



Getting Started
Installation
Quick Start
Migration Guide
Overview
Removed Features
File Mapping
QA Improvements

Migration Guide from Original blech_clust

This guide documents the changes between the original blech_clust and the current katzlabbrandeis fork.

Overview of Changes

The katzlabbrandeis fork represents a significant modernization of the original codebase:

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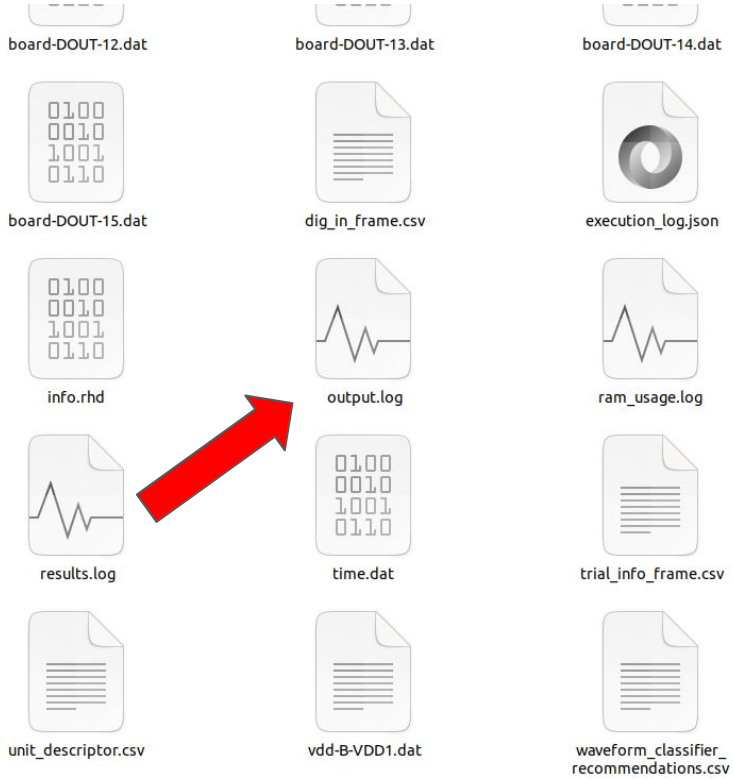
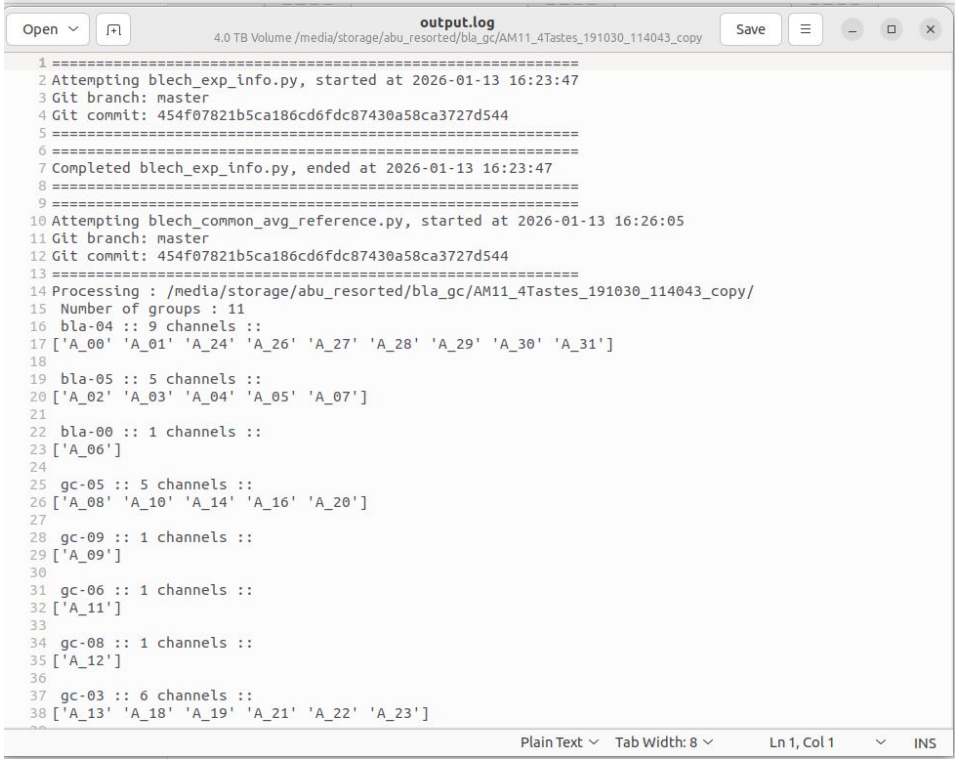
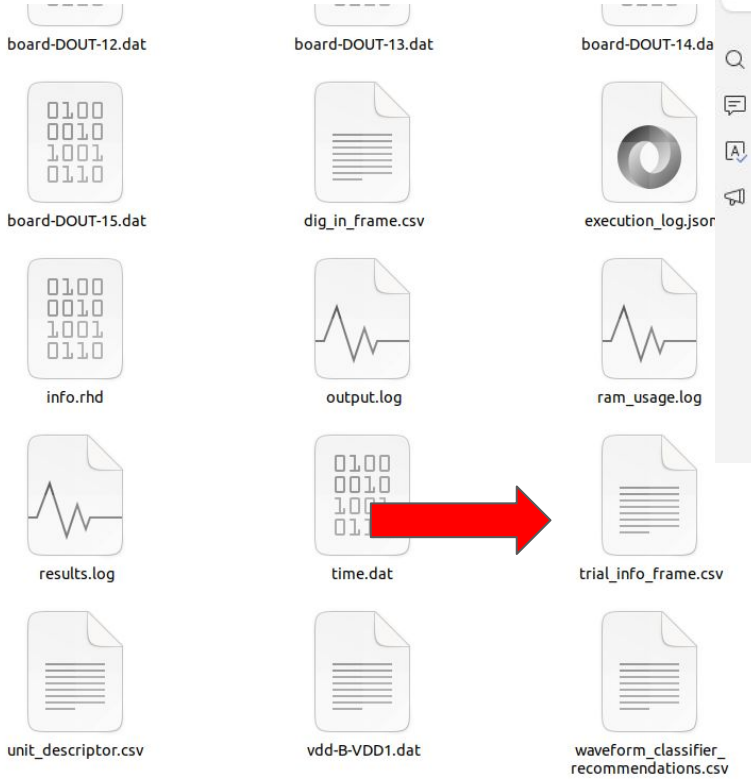
Overview of Changes
Migration Guide Sections
Quick Reference: New Features
Installation and Environment
Testing Infrastructure
Metadata and Parameter Recording
Common Average Reference Improvements

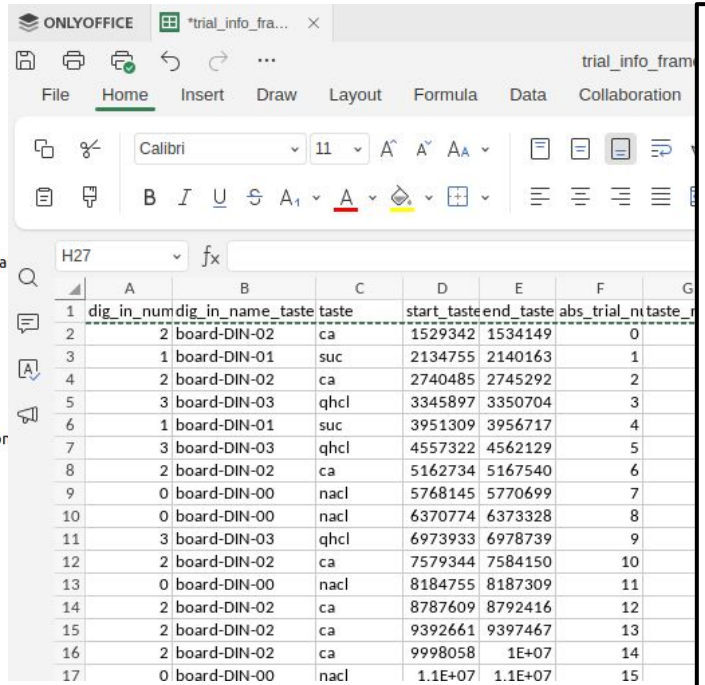
Basic debugging





Easy access to trial info

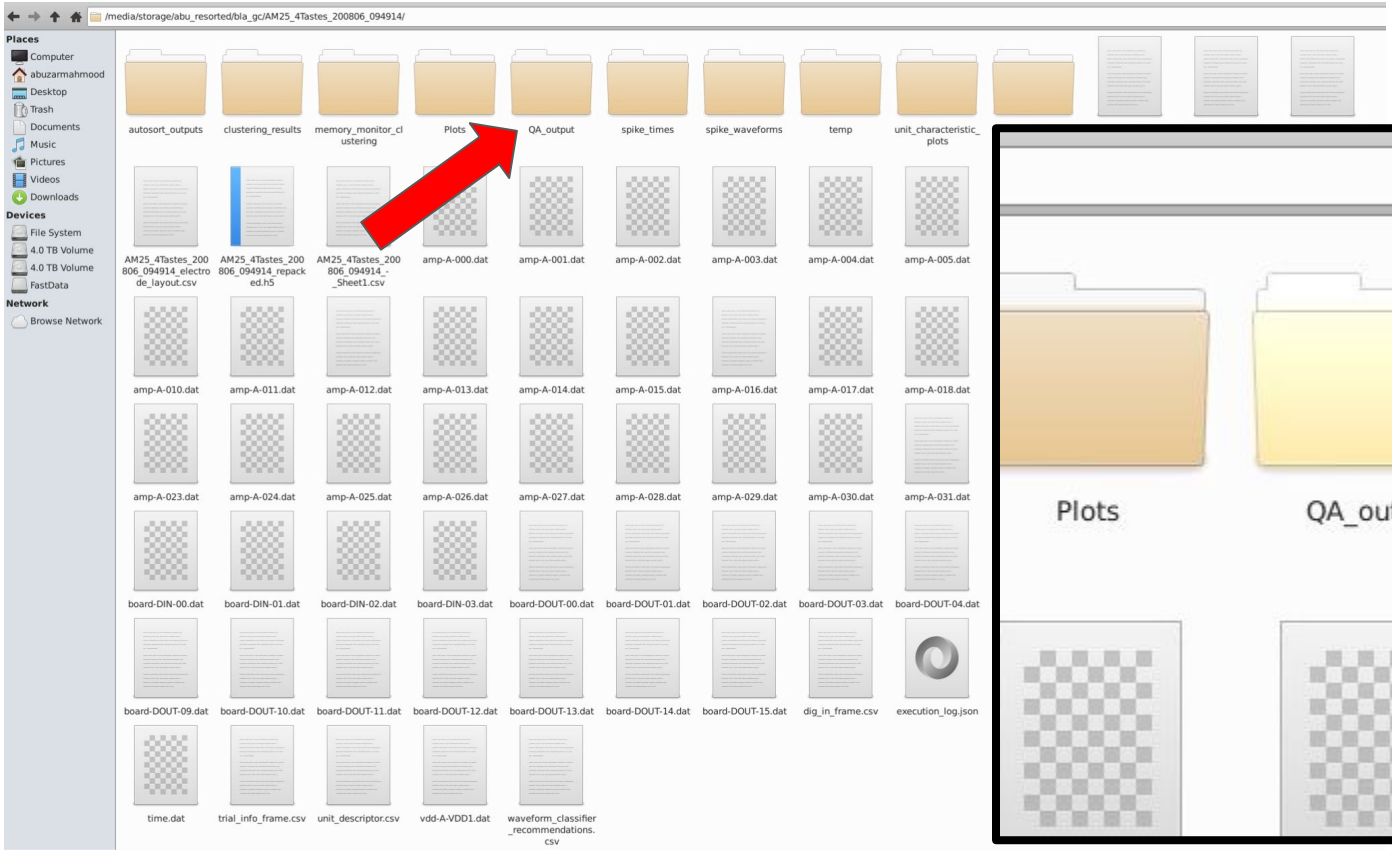


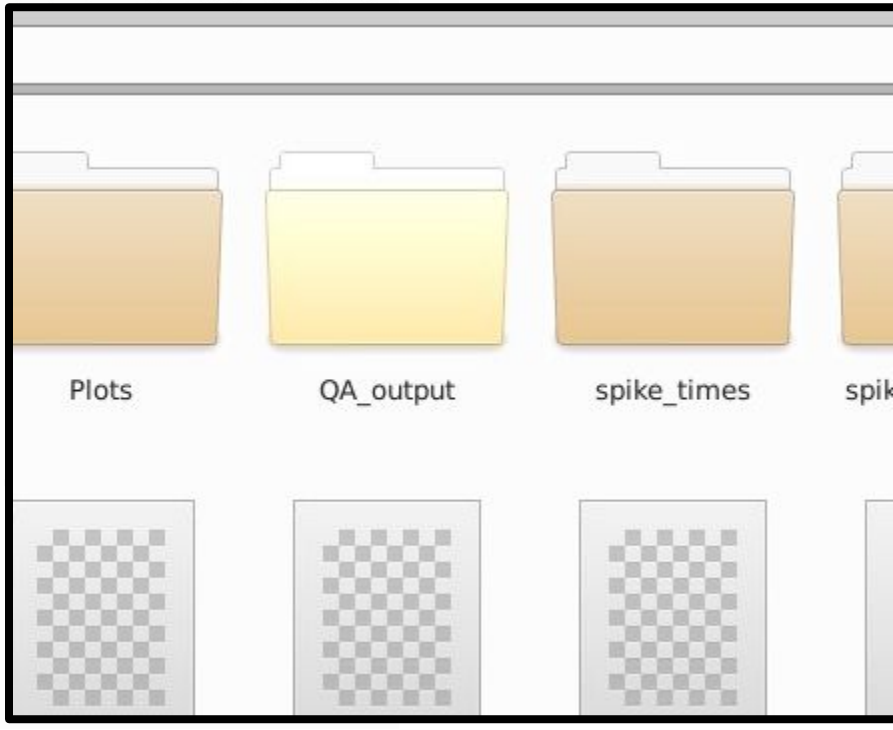


	A	B	C	D	E	F	G
1	dig_in_num	dig_in_name_taste	taste	start_taste	end_taste	abs_trial_n	taste_r
2	2	board-DIN-02	ca	1529342	1534149	0	
3	1	board-DIN-01	suc	2134755	2140163	1	
4	2	board-DIN-02	ca	2740485	2745292	2	
5	3	board-DIN-03	qhcl	3345897	3350704	3	
6	1	board-DIN-01	suc	3951309	3956717	4	
7	3	board-DIN-03	qhcl	4557322	4562129	5	
8	2	board-DIN-02	ca	5162734	5167540	6	
9	0	board-DIN-00	nacl	5768145	5770699	7	
10	0	board-DIN-00	nacl	6370774	6373328	8	
11	3	board-DIN-03	qhcl	6973933	6978739	9	
12	2	board-DIN-02	ca	7579344	7584150	10	
13	0	board-DIN-00	nacl	8184755	8187309	11	
14	2	board-DIN-02	ca	8787609	8792416	12	
15	2	board-DIN-02	ca	9392661	9397467	13	
16	2	board-DIN-02	ca	9998058	1E+07	14	
17	0	board-DIN-00	nacl	1.1E+07	1.1E+07	15	

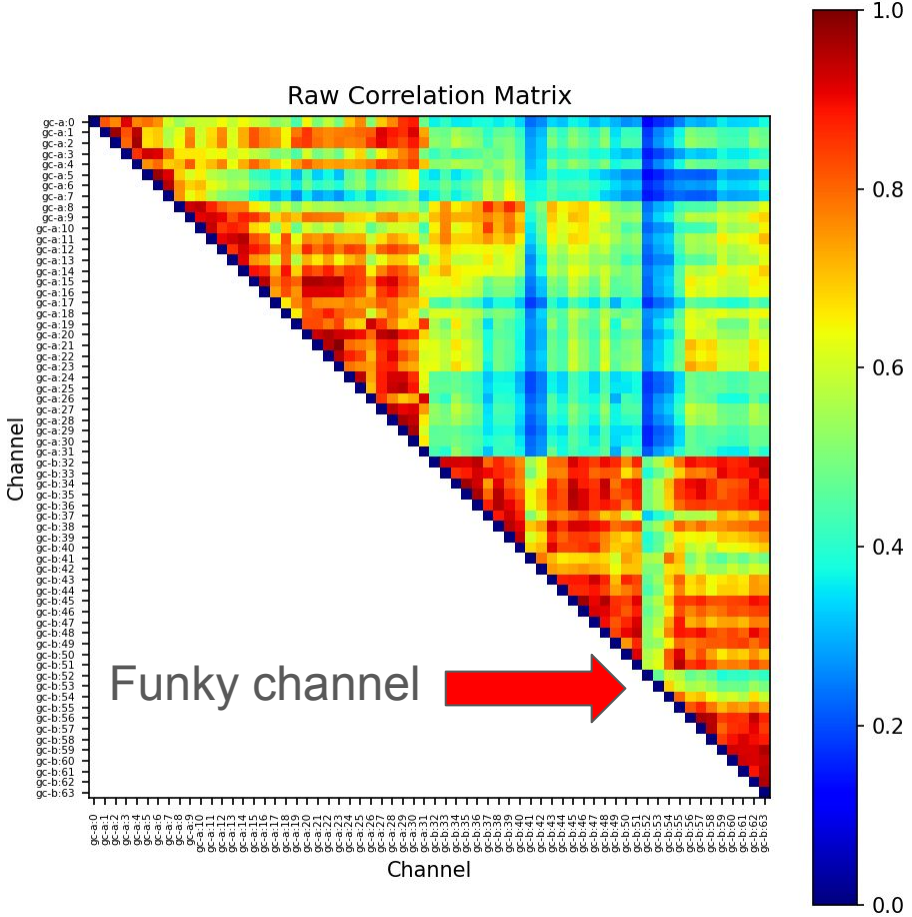
Dig_in_num_taste,
Dig_in_name_taste,
Taste,start_taste,
End_taste,
Abs_trial_num,
Taste_rel_trial_num,
Dig_in_num_laser,
Dig_in_name_laser,
Laser,
Start_laser,
End_laser,
Laser_duration,
Laser_lag,
Start_taste_ms,
End_taste_ms,
Start_laser_ms,
End_laser_ms,
Laser_duration_ms,
laser_lag_ms

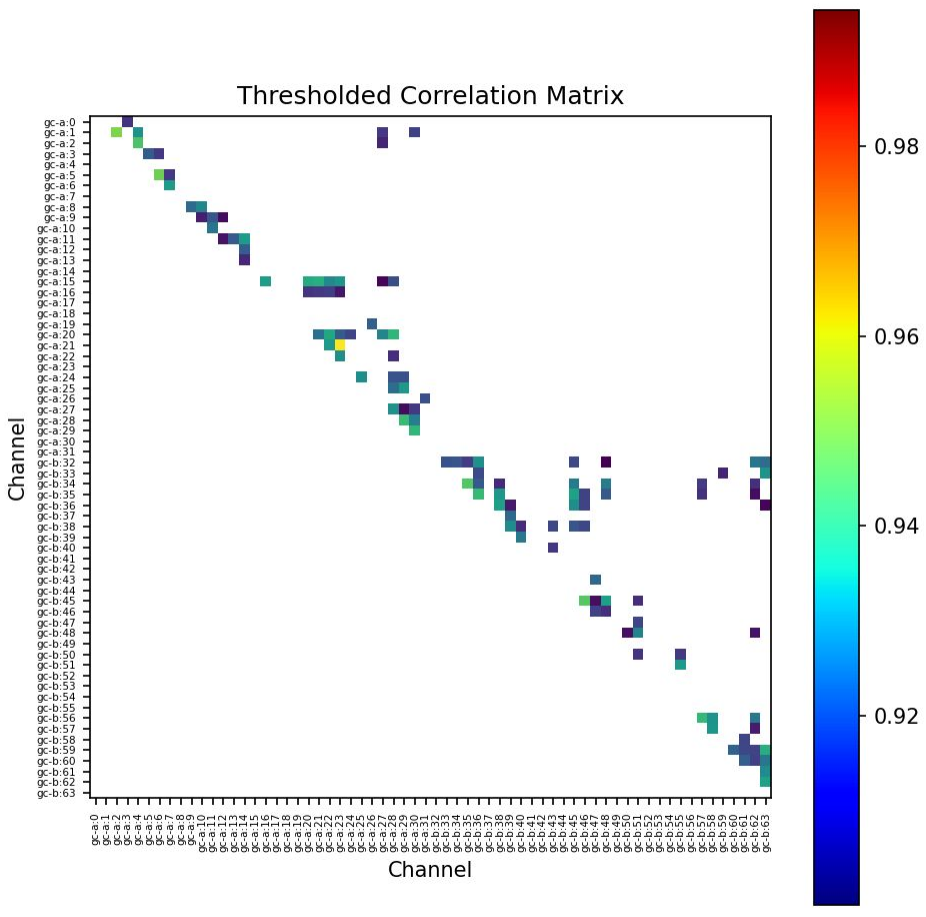
Lots of things in QA_outputs dir



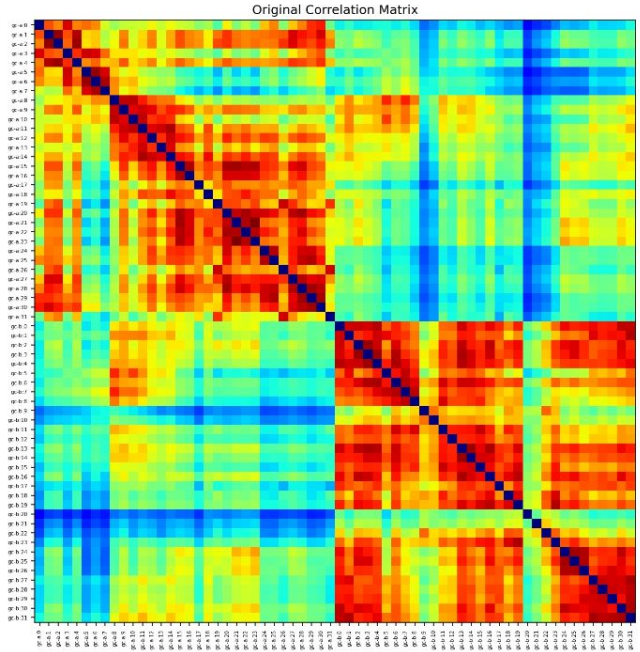


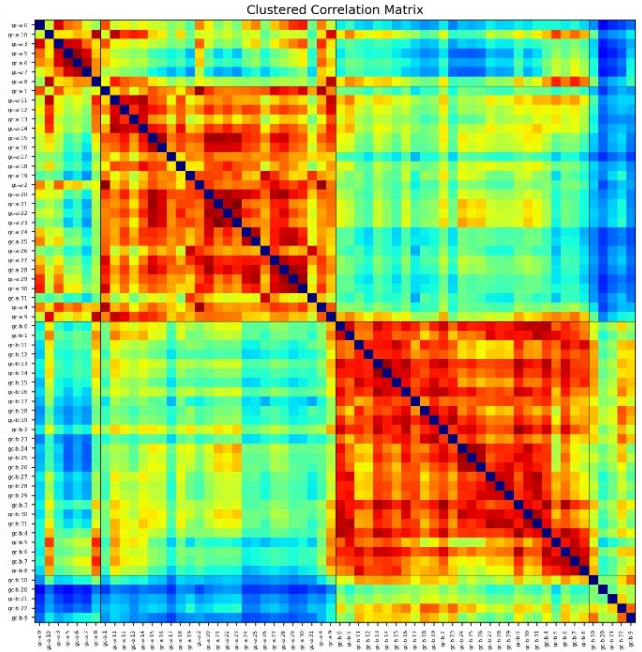
Common Average Reference outputs

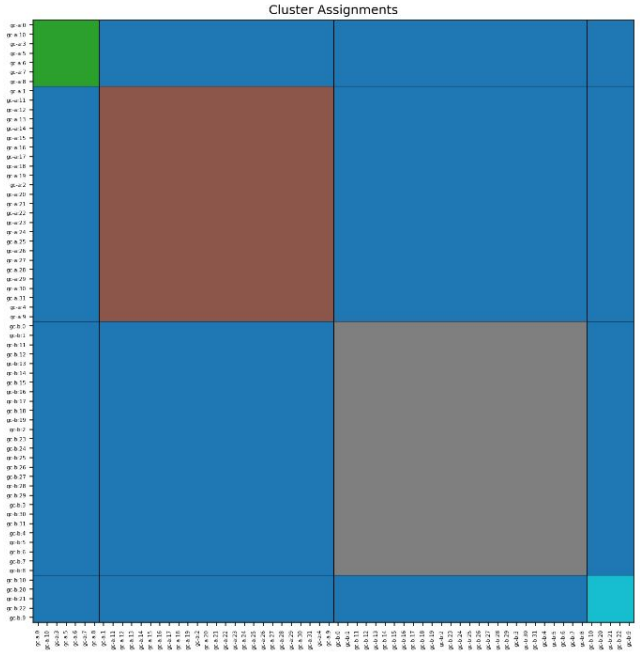




Automated **sub-clustering** of CAR groups

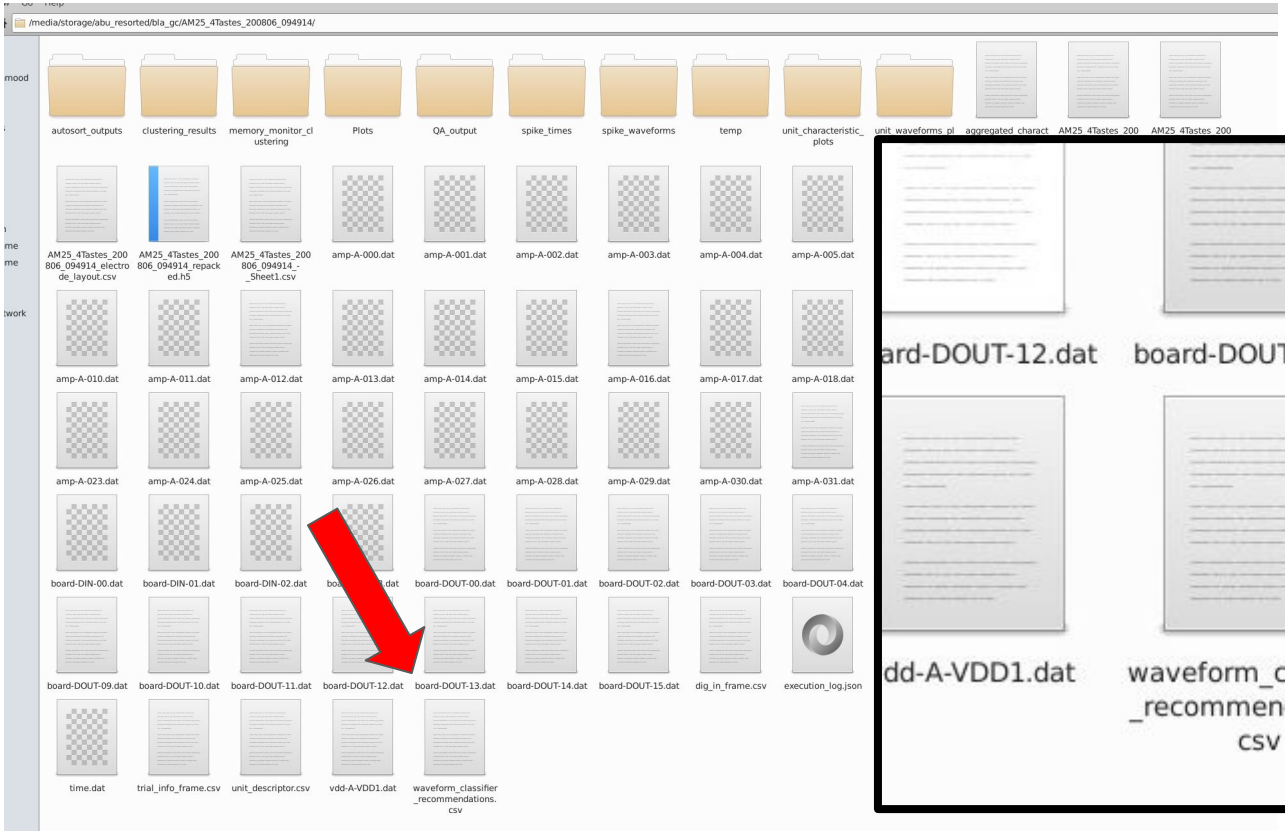


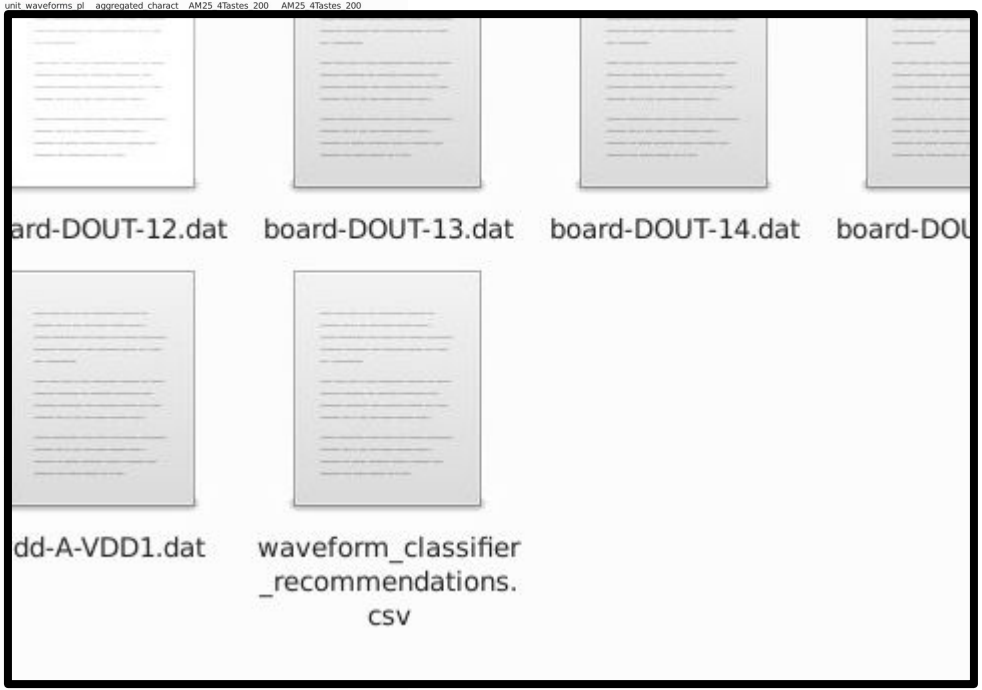




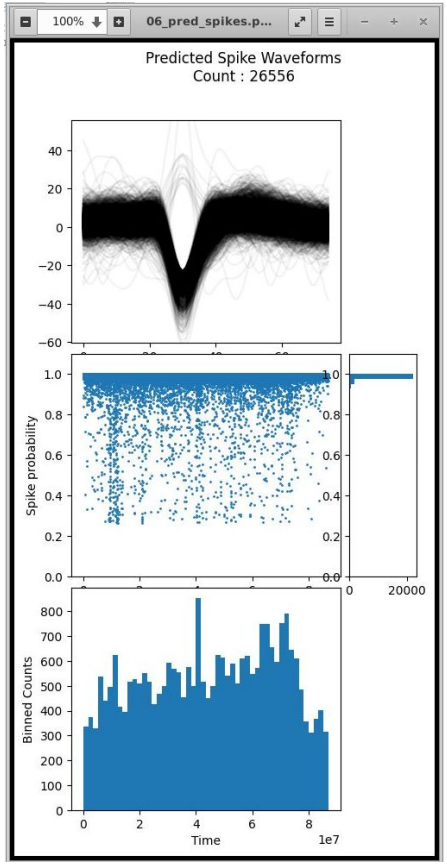
# of clusters determined using BIC on K-Means

Classifier recommendations





Classifier recommendations



WPS Office | waveform_cla···ommendations

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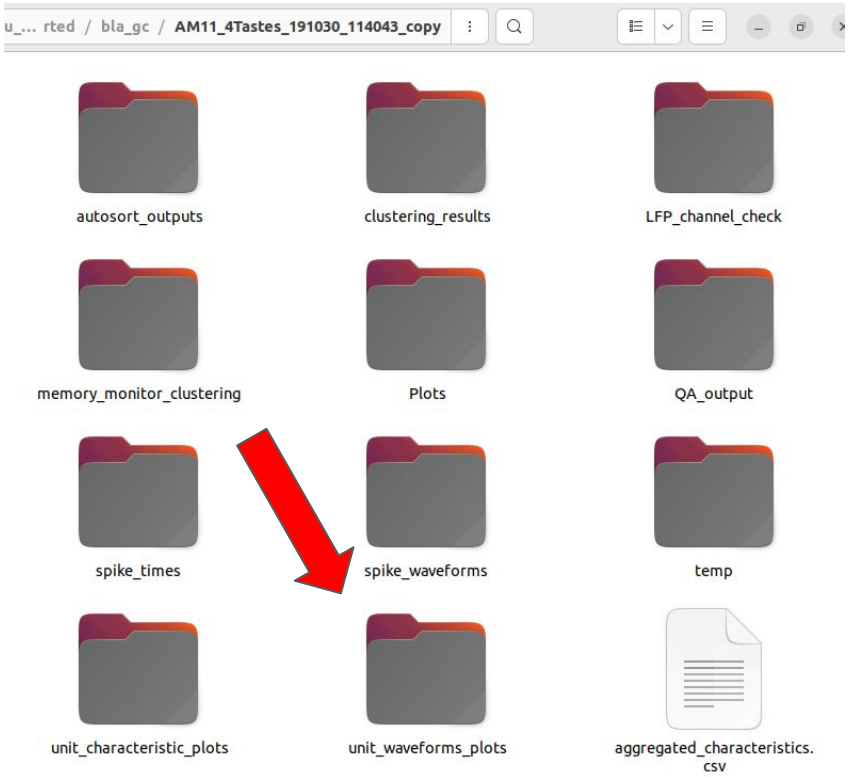
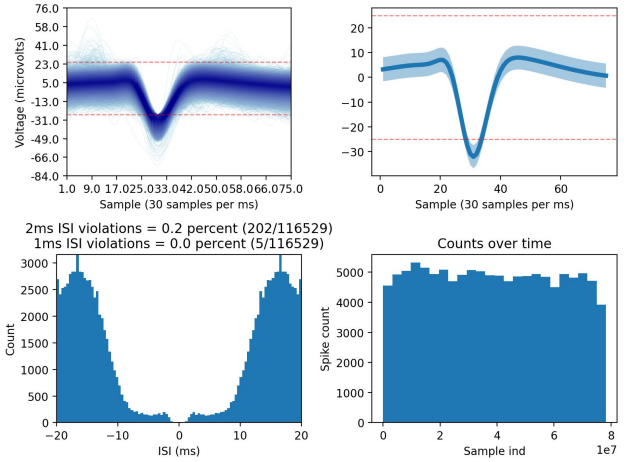
G8

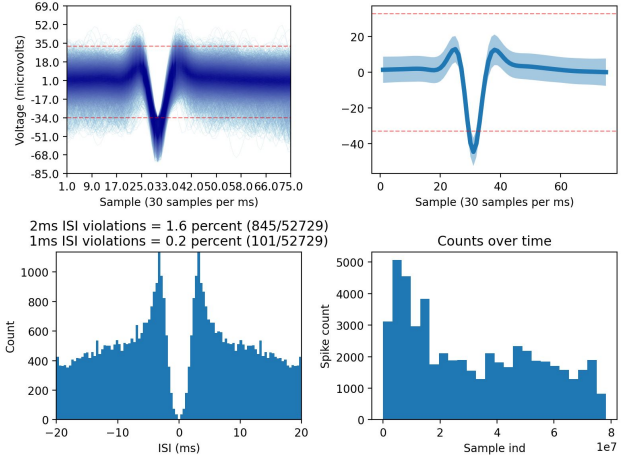
	A	B	C	D	E	F
1		electrod	count	mean_prol	percenti	percenti_95
2	1	1	2110	0.878	0.377	0.997
3	3	3	30760	0.965	0.821	0.999
4	6	6	26556	0.971		999
5	7	7	7363	0.66	0.288	0.987
6	8	8	2316	0.635	0.286	0.979
7	9	9	4432	0.789	0.313	0.995
8	10	10	14113	0.845	0.359	0.996
9	11	11	12135	0.908	0.375	1
10	12	12	3780	0.739	0.301	0.995
11	13	13	2243	0.647	0.29	0.98
12	14	14	2198	0.654	0.292	0.985
13	16	16	28631	0.96	0.792	0.999
14	19	19	5459	0.648	0.288	0.98
15	21	21	5257	0.654	0.291	0.981
16	22	22	2158	0.83	0.322	0.996
17	23	23	3946	0.687	0.298	0.99
18	25	25	16421	0.967	0.818	1
19	26	26	2245	0.727	0.303	0.996
20	27	27	5631	0.624	0.29	0.968
21	28	28	9271	0.955	0.776	0.998
22	29	29	5088	0.659	0.294	0.985
23	30	30	2583	0.911	0.412	0.999
24	31	31	2219	0.843	0.36	0.996

All about unit stability

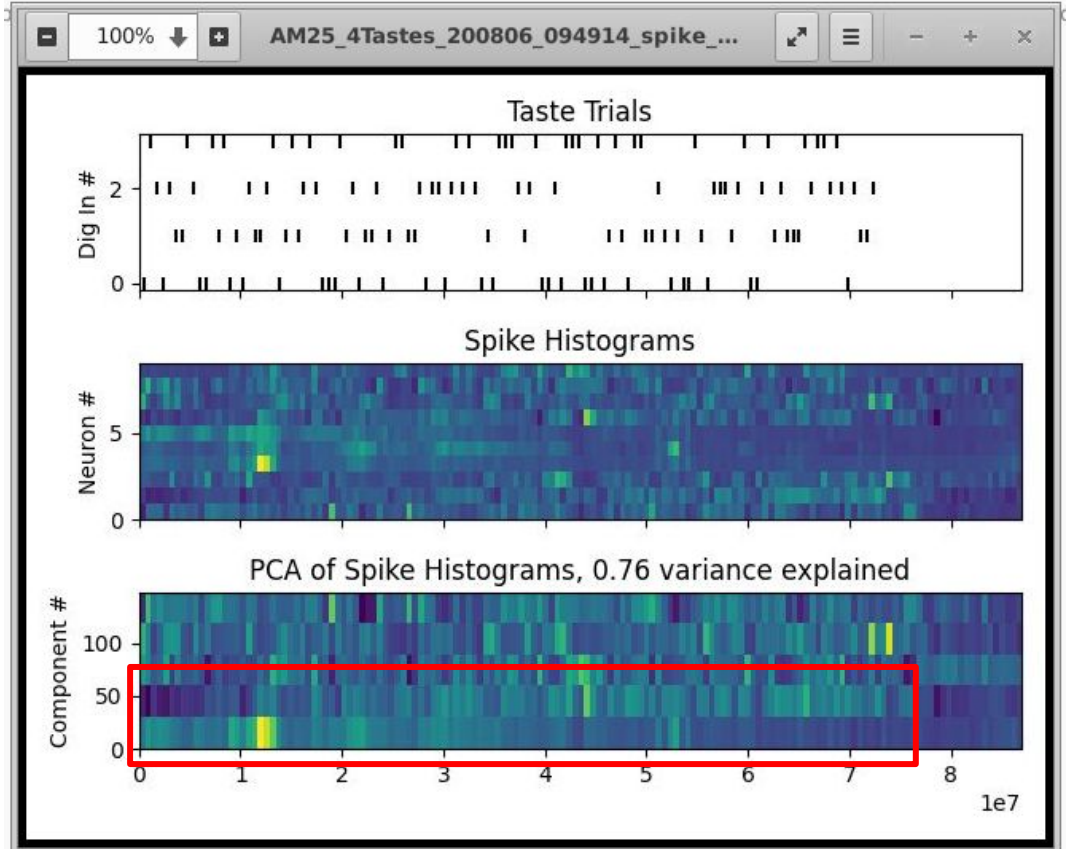
Sorted units spike-counts



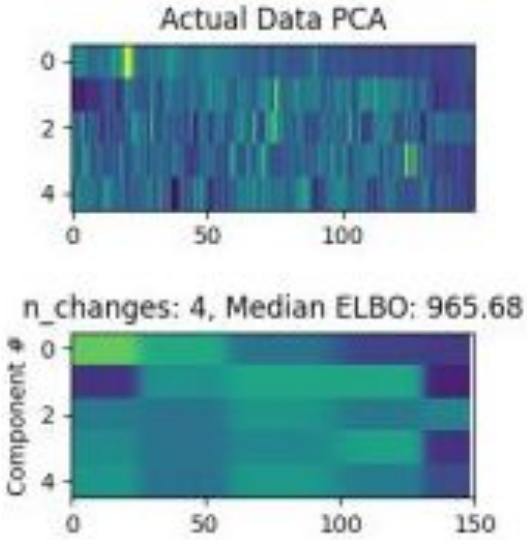


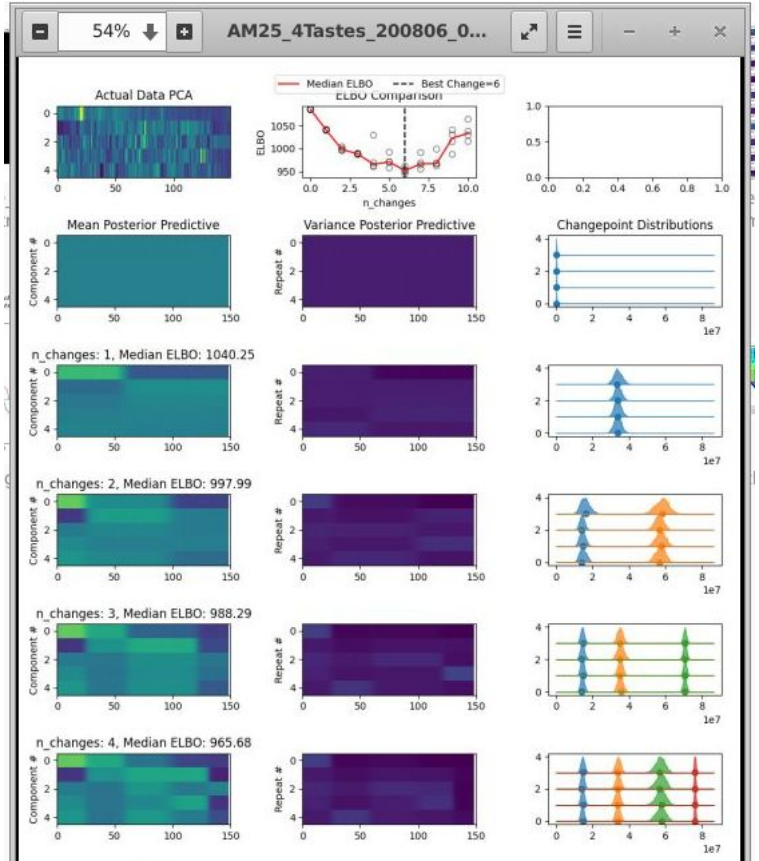


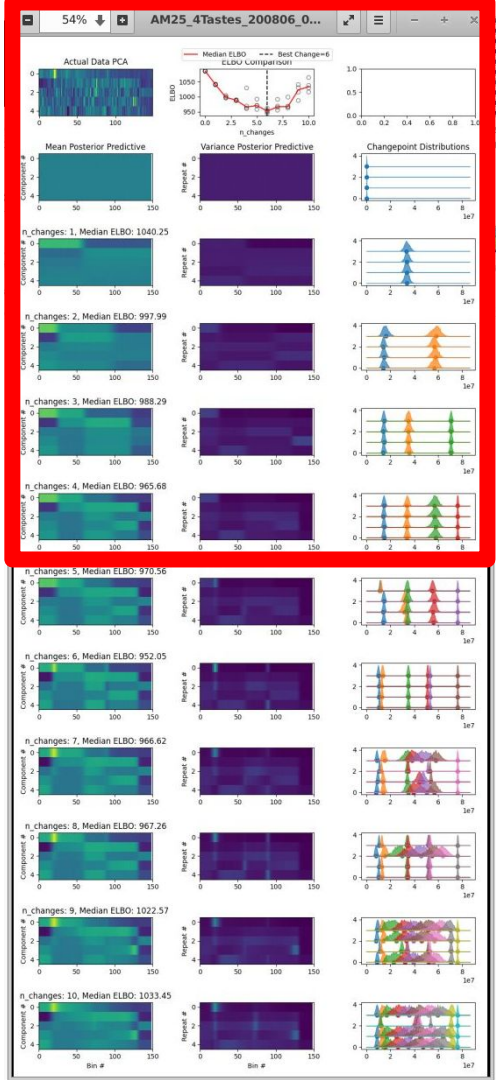
Bulk firing variability over session



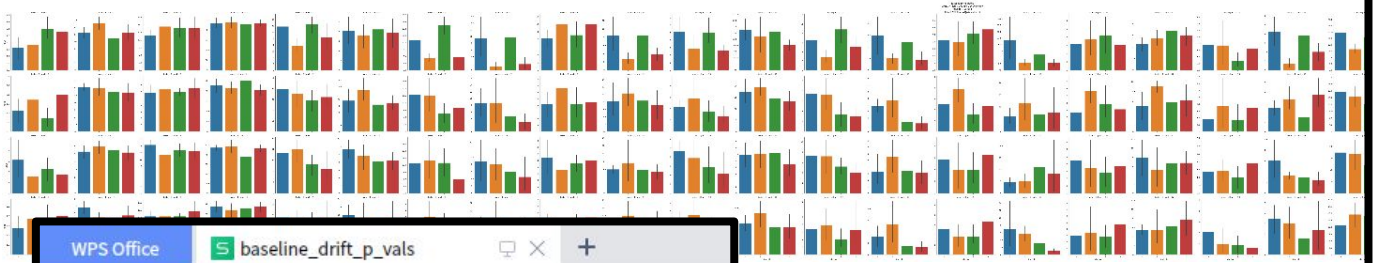
Bulk firing variability over session







Changes in baseline rates



WPS Office | baseline_drift_p_vals

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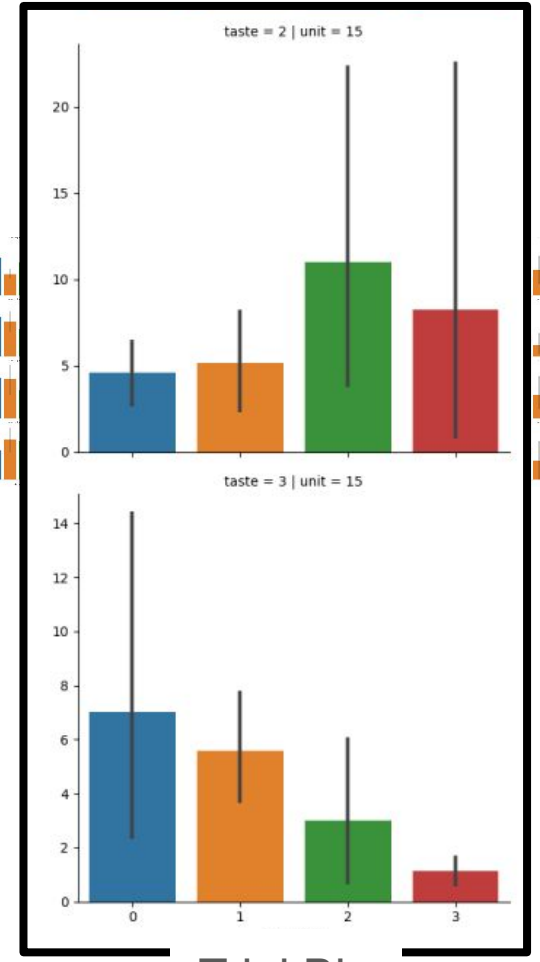
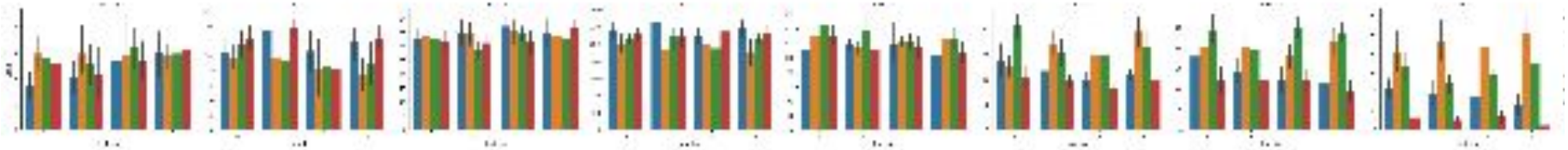
A1

	A	B	C	D	E	F
1		trial_bin	taste	trial_bin *	Residual	unit
2	0	0.67601	0.03115	0.06798		0
3	1	0.10324	0.77822	0.4861		1
4	2	0.68838	0.49648	0.61009		2
5	3	0.84285	0.76545	0.08746		3
6	4	0.22501	0.49345	0.39878		4
7	5	0.23565	0.27651	0.71571		5
8	6	0.0747	0.87517	0.00599		6
9	7	0.03895	0.732	0.26052		7
10	8	0.64293	0.86977	0.36059		8



Trial Bin

Changes in baseline rates



WPS Office | post_drift_p_vals

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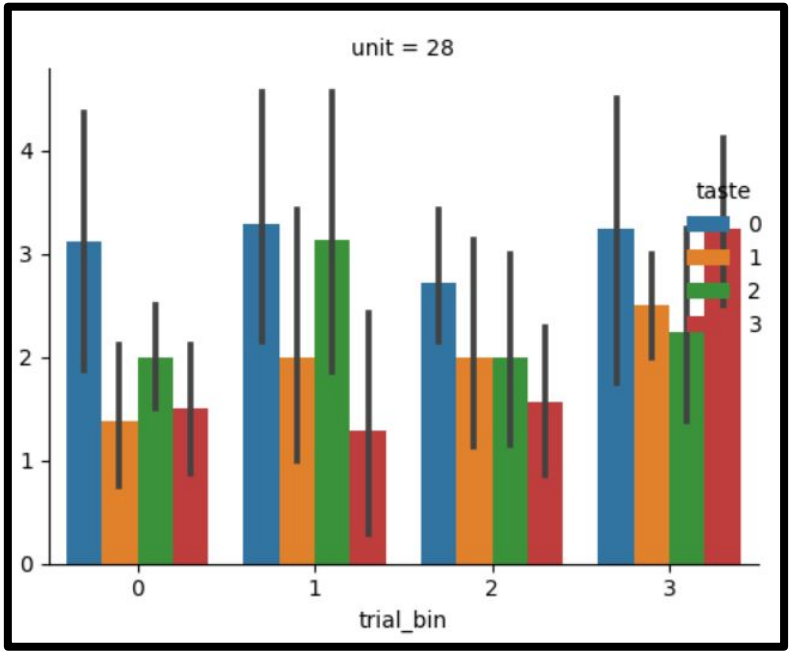
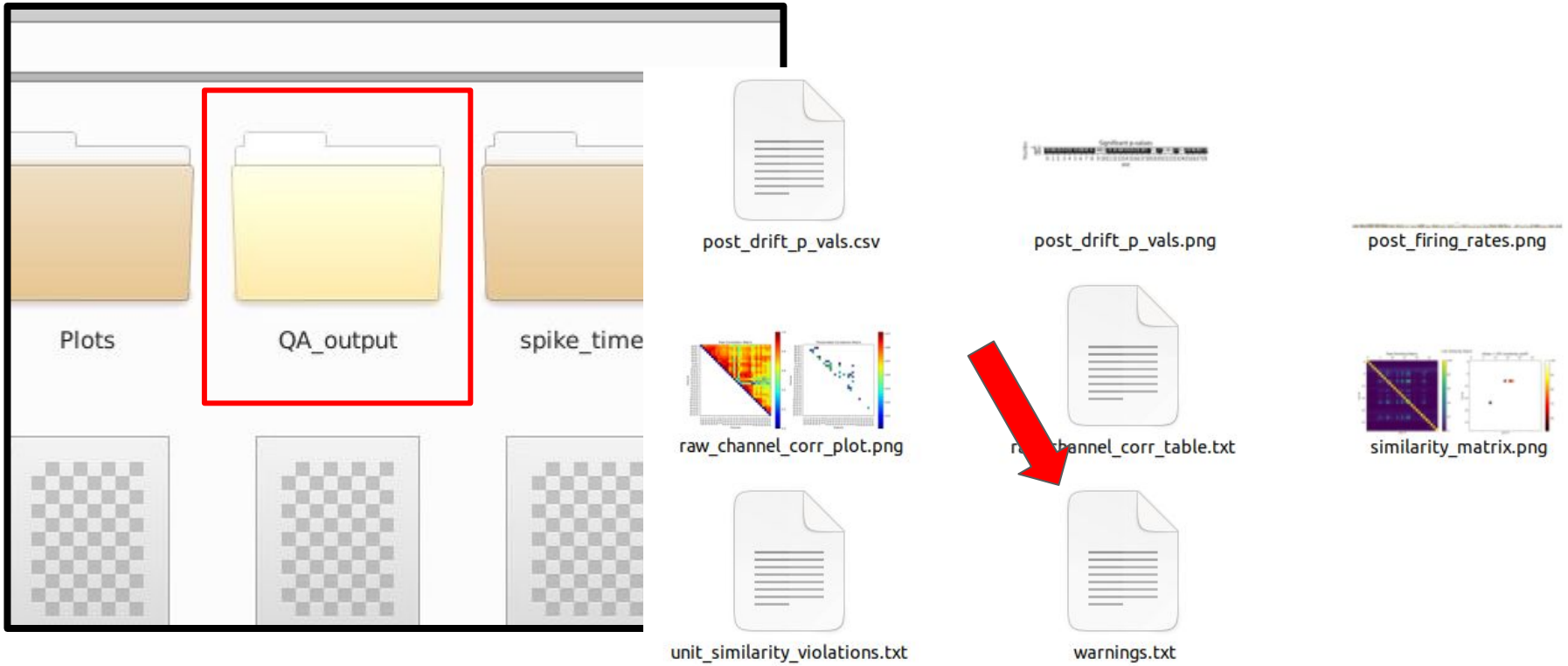
	A	B	C	D
1		trial_bin	Error	unit
2	0	0.08872		0
3	1	0.09235		1
4	2	0.26528		2
5	3	0.68118		3
6	4	0.19955		4
7	5	0.39345		5
8	6	0.4933		6
9	7	0.91557		7
10	8	0.49441		8
11	9	0.0095		9
12	10	0.00247		10



Warnings file



Ephys_data submodule

- Data handling and processing
- Visualizing
  - Rasters
  - Firing rate grid plots

```
from utils.ephys_data.ephys_data import ephys_data



# Initialize with data directory

data = ephys_data(data_dir='/path/to/data')
```

Ephys_data submodule

Loading spikes	`data.get_spikes()`
Extracting LFPs, calculating STFT	`data.get_lfps()` `data.get_stft()`
Calculating firing rates + unit properties	`data.get_firing_rates()` `data.calc_palatability()`

Separating data by region	`data.get_region_units()`
	
	`region_spikes = data.return_region_spikes('region_name')`
	`region_firing = data.get_region_firing('region_name')`
	
	`region_lfps, region_names = data.return_region_lfps()`

Separating data by laser condition	`data.separate_laser_data()`
	
	`# Access separated data`
	`on_spikes = data.on_spikes`
	`off_spikes = data.off_spikes`
	`on_firing = data.on_firing`
	`off_firing = data.off_firing`

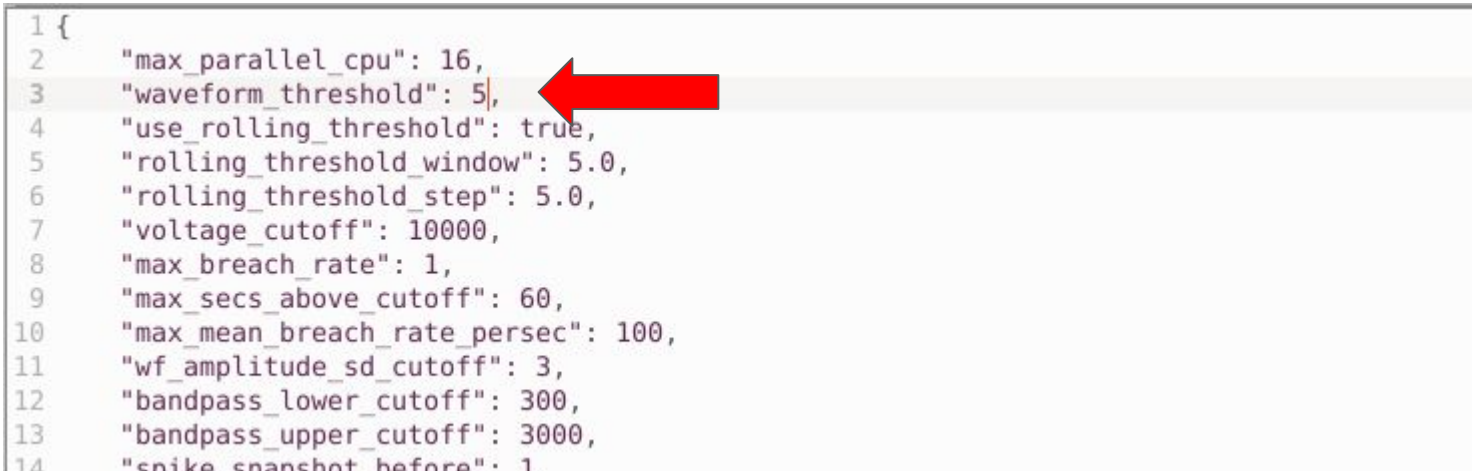
Loading experimental + unit metadata	`data.get_info_dict()`
	`data.get_trial_info_frame()`
	`data.get_unit_descriptors()`

What to do if you have noise

1. Cry 😭
2. Try out these folk remedies

Reduce spike detection threshold

- <data_dir>/<session_name>.params
- Set “waveform_threshold” to 3 or 4



Adjust classifier settings

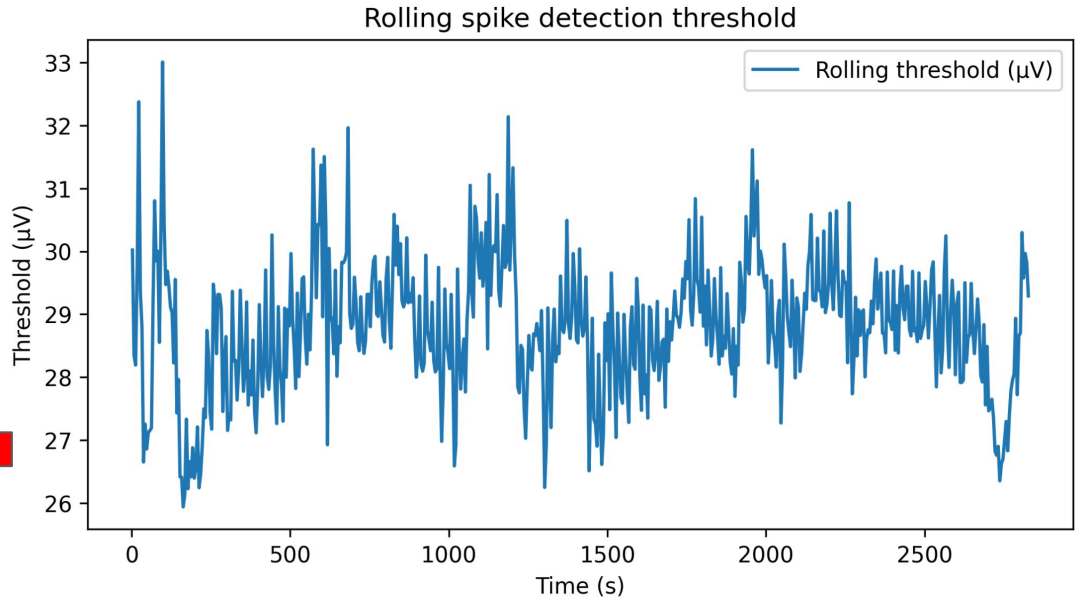
- blech_clust/params/waveform_classifier_params.json
- Set “throw_out_noise” to true
- Can override classifier threshold by setting “override” to true
  - This may increase false positive waveforms sorted

File: waveform_classifier_params.json

```
{
    "use_neuRecommend": true,
    "use_classifier": true,
    "throw_out_noise": false,
    "min_suggestion_count": 2000,
    "classifier_threshold_override": {
        "override": false,
        "threshold": 0.8
    }
}
```

Use rolling-window threshold (experimental)

```
{
    "max_parallel_cpu": 16,
    "waveform_threshold": 5,
    "use_rolling_threshold": true,
    "rolling_threshold_window": 5.0,
    "rolling_threshold_step": 5.0,
    "voltage_cutoff": 10000,
    "max_breach_rate": 1,
    "max_secs_above_cutoff": 60,
    "max_mean_breach_rate_persec": 100,
    "wf_amplitude_sd_cutoff": 3,
    "bandpass_lower_cutoff": 300,
    "bandpass_upper_cutoff": 3000,
    "spike_snapshot_before": 1
```



Housekeeping

- Please upload your code to katzlabbrandeis github
  - You can also have your repository forked (copied) to katzlabbrandeis
  - It DOESN’T have to be clean code…the repository can be kept private