# Exploring opto data before sorting

## Problem:

movement artifacts in recorded multichannel data result in erroneous or unusable data when spike sorting

Proposed solution:

Use **c**ommon **a**verage **r**eference (CAR) or **c**ommon **m**edian **r**eference (CMR) to reduce artifacts/noise that is common across recorded channels

## Needed Capabilities:

Plot and scroll through data

Preview referenced data and compare pre- and post- referencing data

This is needed in order to evaluate performance of referencing in reducing artifacts/noise

Select channels to export for sorting

* some channels might be bad (either silent due to break in trace on probe) or might have increased noise due to impedance differences or changes. Do not want undesired biasing of the common average or median due to this
* do this in Plexon?
  + issue here is that Plexon channel selection will not solve the biased avg/med
* what about other sorters that use geometry of sites on electrode?
  + excluding channels will require adjustment of probe geometry or somehow the algorithm will need to be able to cope with missing channels

## Issues to resolve:

## Plotting long time series

how to handle “big” data in MATLAB?

how to plot and “scroll” through data”

What is the minimum necessary feature list

do we need to plot all tests at once? all trials for one test in scrollable form? trial-by-trial?

## Notes:

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need to mock up (sketch) UI

might be simplest to just programmatically implement (vs GUIDE/AppDesigner)

modify multichanplot?

things to show:

animal/file information

test name

trial number (trial #/total)

stimulus onset/offset?

stimulus type/parameters?

some ideas:

<https://github.com/edden-gerber/time_series_analysis_and_statistics/blob/master/plotting/multichanplot.m>

https://www.mathworks.com/matlabcentral/answers/558370-how-to-generate-a-stacked-plot-with-a-scroll-bar

<https://www.mathworks.com/matlabcentral/answers/97964-how-can-i-use-scrollbars-in-matlab-figure-windows-when-viewing-large-guis#answer_107314>

<https://www.mathworks.com/matlabcentral/fileexchange/1670-scrolling-plot-demo>

other tools:

https://stackoverflow.com/questions/5854515/interactive-large-plot-with-20-million-sample-points-and-gigabytes-of-data

https://www.paraview.org/

https://visit-dav.github.io/visit-website/index.html

* step 1

information point

* + sub point
  + sub point

## section 3

* *note 2*
* *note 3*
  + N.B.:
* Step 1
* **ALERT!**

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