KIC\_DAT Version 0.6: new features/fixes/updates

Thanks to Adam Hill, Jeffrey McArthur and Melissa Mangala for testing the code. Code was tested on Matlab version R2020b and R2021a. It also runs well on the remote server VCCSO1 with Matlab R2020b. Below is the summary of the features added to version 0.6:

1. write numerical values to xls files instead of strings (cell data type)
2. replaced APD50/APD90 ratio with APD30/APD90 ratio
3. only show 'true' flags in tables for better visibility
4. added 3 new sheets (tabs):
   1. QC Passed Stats (All): listing N, average, standard deviation (STDEV) and standard error of the mean (SEM)
   2. QC Passed Stats (Paced): listing the same statistics above but only for cells with pulse(s) that start on stimulus
   3. QC Passed Data: listing raw baseline corrected data for all QC passed cells
5. use table data structure instead of individual column array data structure to easily store, reuse and manipulate data
6. added 3 options for user to either
7. parallel batch analyse all csv data files in a folder (uses Matlab Parallel Computing Toolbox)
8. sequentially batch analyse all csv data files in a folder
9. analyse a single csv file
10. insert figures quietly in output xls file without annoying pop ups
11. add new statistics column "ActivationPointIntervals\_ms" to estimate pulse rate
12. update log messages to include parallel execution and timings details
13. save output file in the newer xlsx format to increase the limit in the maximum number of rows

**Performance gains of version 0.6 vs 0.5**

1. performance gain after removing figure pop ups: 1.12 times faster execution time
2. performance gain of parallel execution on an 8-core workstation of 8 csv data files: 4.45 times faster execution time

Chart, line chart

Description automatically generated

Overall, the code achieves almost ideal speedups with the increase in the number used CPU cores (i.e., time required to execute multiple csv data files reduces linearly with the number of available execution cores). The performance was tested on Dell OptiPlex 7070 workstation with Intel core i7-9700 3GHz 8 cores and 16GB memory.