"i-GUV" virtual instrument

This program has been created by **Manlio Tassieri** and it is based on the analytical procedure introduced by David J. Patersona, Manlio Tassieria, Julien Rebouda, Rab Wilsona and Jon M. Cooper, in "*Lipid Topology and Linear cationic antimicrobial peptides: a novel mechanistic model*".
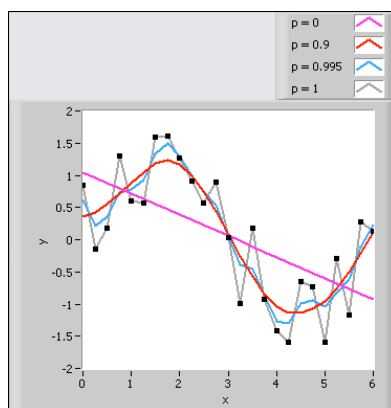
About the code

This program has been written in LabVIEW 2014. Copies of the code written for previous versions of LabVIEW are available on request; please send a request by email to: Manlio.Tassieri@glasgow.ac.uk.

Modus operandi

When you run the program, a dialog box appears asking you to choose the file to read and analyse (i.e. the file containing the normalized fluorescence intensity (NFI) function data). Note that the file to read must be of type .dat or .txt. It may contain more than two columns; however the executable reads only the first two columns of the file. These must be: {time [s], NFI [-]}. The file must not contain column headings and the first row of data should not have elements equal to zero.

Once the NFI data file has been chosen and opened, the data are displayed on the top-left graph of the application's front panel (Figure 1). These data are smoothed by means of a cubic spline fitting function (red symbols), according to a balance parameter (p). If p = 0, the fitted model is equivalent to a linear model. If p = 1, the fitting is equivalent to cubic spline interpolation. p must fall in the range [0, 1] to make the fitted curve both close to the observations and smooth. The closer p is to 0, the smoother the fitted curve. The closer p is to 1, the closer the fitted curve is to the observations. The following front panel shows the fit results when p takes different values.

The same data are then re-displayed in the top-right graph of the front panel as − Ln(NFI) vs. time. Then, the time derivative of the smoothed data is evaluated and the results are shown in the bottom-left graph of the front panel. These data represent the instantaneous rate of efflux of the dye-leakage process. Two cursors allow the operator to calculate the average rate and its standard deviation within a certain time range. This is achieved by placing the green and the red cursors at the start point and

at the end point of the time window of interest. The resulting average is shown beside the graph.

The bottom-right graph of the front panel shows the histogram of the instantaneous rate of efflux for each measurement. The count indicates the total number of times an instantaneous rate of efflux appears.
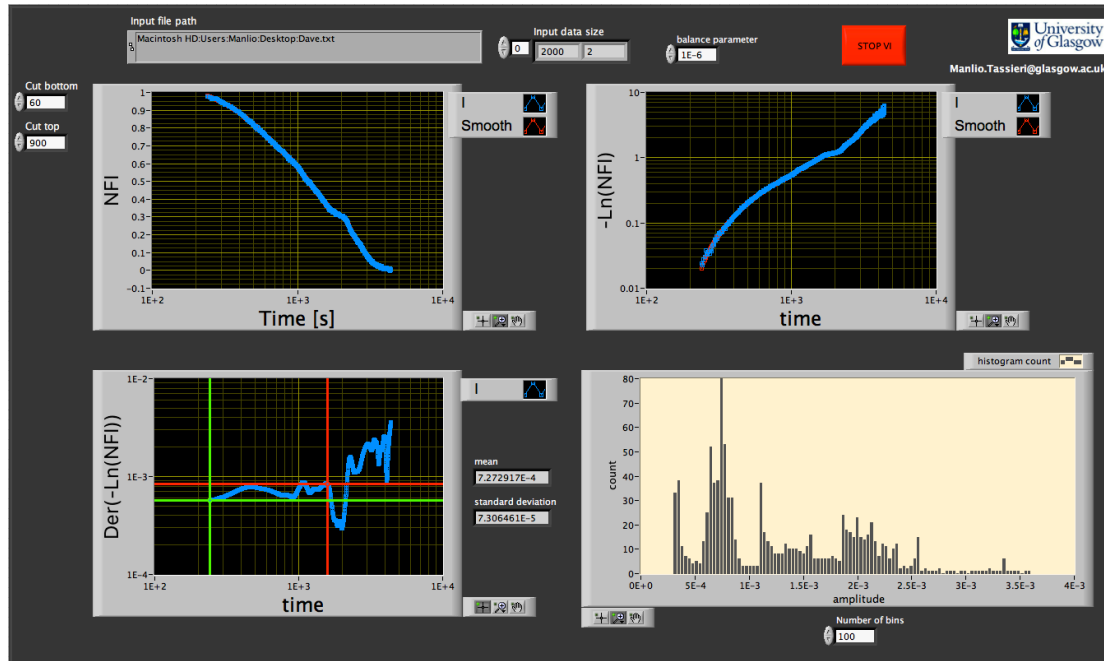

Figure 1. Front panel of the program.

For each figure data can be extracted by right-clicking on the figure and selecting "Export – Export Data To Clipbord".

During execution, the program can be stopped at any time by pressing either the "Stop VI" button or the little red button on the top toolbar (top-left in Figure 1).

The program can be re-started by pressing the white arrow button on the top toolbar (top-left in Figure 1).

For further information or questions, please do not hesitate to contact me:
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