

# **AutoDISC User Manual**

## **Citations**

If you use AutoDISC for a publication, please cite

<https://doi.org/10.1101/2021.02.07.430124> which describes the theory behind AutoDISC.

## **System Pre-Requisites**

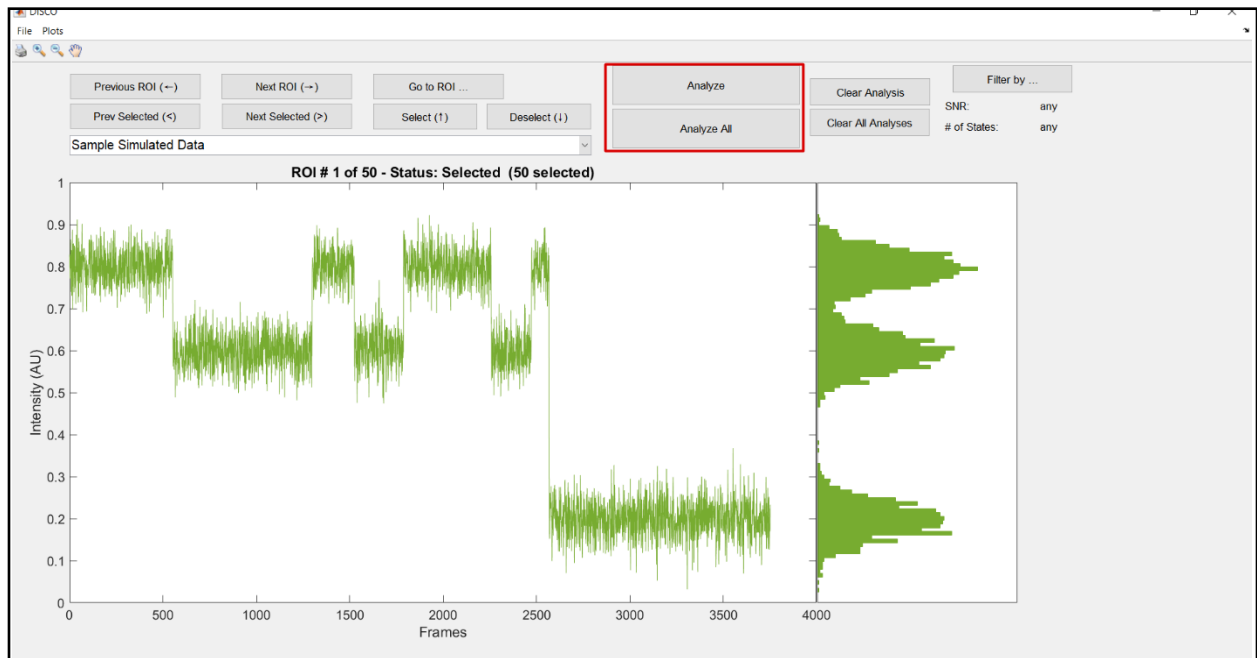
AutoDISC is written entirely in MATLAB and does not require external installation. The Statistics and Machine Learning Toolbox is required.

## **Running AutoDISC**

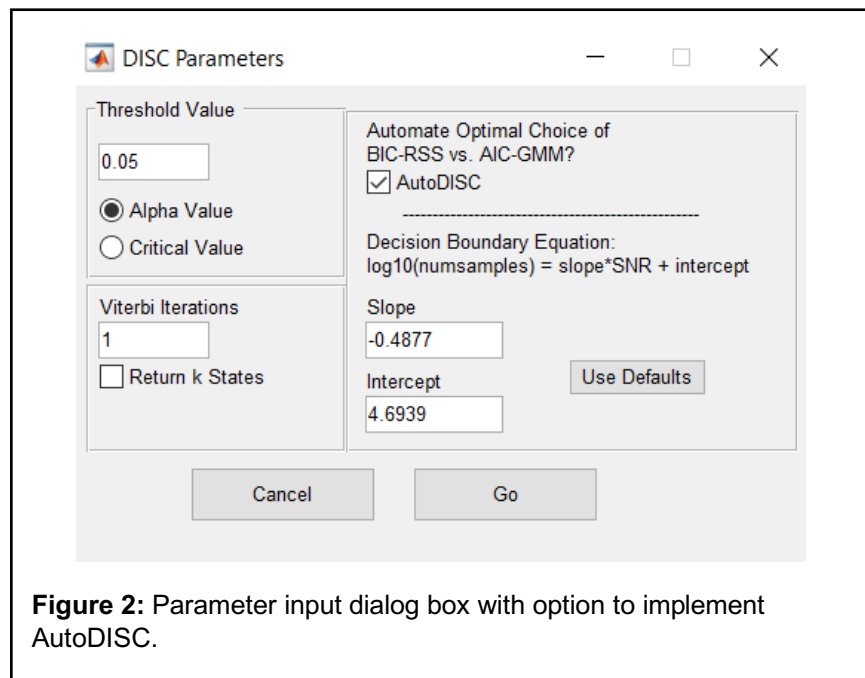
AutoDISC is an extension of DISC (<https://doi.org/10.7554/elife.53357>). The software implementation of AutoDISC is available at <https://github.com/marcel-goldschen-ohm/AutoDISC>. The software is built on top of DISCO, DISC's original MATLAB user interface (<https://github.com/ChandaLab/DISC>), although it is not necessary to download the original as it is included in the AutoDISC repository. For general use of DISCO (loading data, understanding outputs, storing results), see the previous user manual (<https://github.com/ChandaLab/DISC/blob/master/docs/Manual.pdf>).

1. Download the AutoDISC repository from <https://github.com/marcel-goldschen-ohm/AutoDISC>.
2. Add the AutoDISC-master/ folder and all subfolders to MATLAB's path.
3. Run the UI by executing the command 'DISCO'. You will be asked to load a data file. A sample data file is available in AutoDISC-master/sample\_data\_AutoDISC/sample\_data\_AutoDISC.mat. This sample data file contains 50 time series that can be iterated over with the Previous and Next ROI buttons. To load your own data, see the DISCO user manual for the required format in AutoDISC-master/docs/Manual.pdf.
4. Click the "Analyze" button near the top of the GUI to idealize the current trace or the "Analyze All" button to idealize all traces in the dataset (**Figure 1**).
5. After clicking "Analyze" a dialog box will open with optional parameters (**Figure 2**). The right side of this box includes a check box indicating whether AutoDISC will be implemented (if unchecked, DISC will run without any automated criterion selection). If checked, the AutoDISC workflow will run and automatically select between criteria  $BIC_{RSS}$  and  $AIC_{GMM}$  as described in <https://doi.org/10.1101/2021.02.07.430124>. You also have the option of using a custom linear boundary.
6. To export your results, choose 'File->Save Data' from the menubar in the UI. The file contains a 'rois' MATLAB struct array with a 'time\_series' field for the data series and a 'disc\_fit' field for the idealization results. 'disc\_fit' is itself a struct with an 'ideal' field for the idealized series and a 'parameters' field that is a struct containing all

idealization parameters including the agglomerative and divisive objective criterion used.



**Figure 1:** Data loaded into DISCO with analysis buttons outlined.



**Figure 2:** Parameter input dialog box with option to implement AutoDISC.