CindeR User Guide

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1 General Information

General information section explains general terms and the purpose for which the CindeR tool is intended.

1.1 Software overview

CindeR is a shiny application, which allows the classification of observations. The application provides a user interface to manually classify observations that are visualized with a corresponding plot. The classification can be performed with the left and right arrow on the keyboard for *FALSE* and *TRUE*, respectively. Furthermore, it is possible to swipe left and right for the same classification which is realized through the *shinysense* `https://github.com/nstrayer/shinysense` package. Moreover, the whole code is available on github under `https://github.com/kusterlab/cindeR` and could be run locally using R.

1.2 Organization of the Manual

The user's manual consists of five sections: General information, Software Summary, Getting Started, Using the Software and Video tutorial.

General information section explains general terms and the purpose for which the CindeR tool is intended.

Software Summary section provides a general overview of the software. The summary outlines the user's access levels and the corresponding limitations or requirements according to the access level.

Getting Started section explains how to access CindeR. Furthermore, the software menu is briefly explained.

Using the Software section provides a detailed description of software functions.

The Video tutorial section provides a link to a video tutorial that shows with an example dataset, how to use this tool.

2 Software Summary

Software Summary section provides a general overview of the software. The summary outlines the user's access levels and the corresponding limitations or requirements according to the access level.

2.1 User Access Levels

The code of the application is available under `https://github.com/kusterlab/cindeR` and could be implemented on local computers or severs. The versions of the packages that were used to build the software are specified in the packrat file.

2.2 Notices

CindeR is open source software and comes with absolutely no warranty.

3 Getting Started

Getting Started section explains how to access CindeR. Furthermore, the software menu is briefly explained.

3.1 Accessing the Software

The newest version currently available can be accessed under the git repository `https://github.com/kusterlab/cindeR`.

3.2 Software Menu

CindeR is a tabbed application, which consists of 2 tabs (1). One tab contains file input and observation judgment, whereas the other contains the input of the plot function.
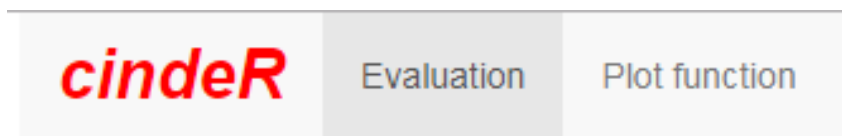

Figure 1: Main menu of the CindeR shiny application

3.2.1 Plot function

To visualize the observations that are to be judged a plot function is required. Since the *CindeR* interface is generic and the variety of plots is high, no default plot methods are available. Therefore, a plot function is to be uploaded 2. An example plot function can be found in "ref". Also in this section the requirements such a plot function has to full fill are specified. However, for the test dataset there is also a corresponding plot function available. This plot function has to be defined within an R script and needs to be named starting with "plot_".
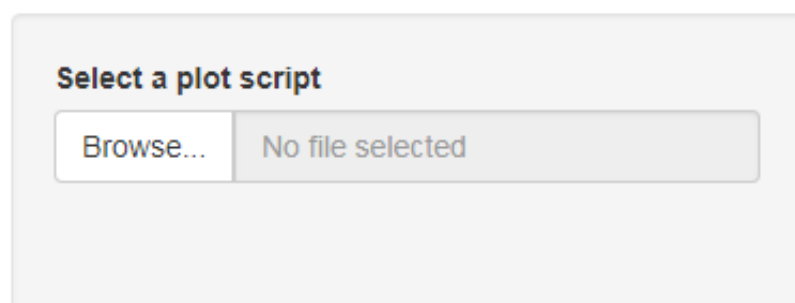

Figure 2: Plot upload of the CindeR shiny application

3.2.2 Evaluation

Here the dataset that is to be judged can be uploaded. Accepted are *.csv* files in different occurrences. The selection of the properties of the

uploaded *.csv* has to be done before the dataset is uploaded 3.

Figure 3: Evaluation tab of the CindeR shiny application

Once the dataset and the plot function is uploaded one can start to judge. Pressing the left arrow key or swiping to the left classifies the visualized observation as negative while pressing the right arrow key or swiping to the right classifies the visualized observation as positive.

The *Progress* field indicates how many observations are currently judged from all observations that were in the uploaded dataset. Furthermore, the current progress could be downloaded using the corresponding button.

Furthermore, the *back* button allows the user to step ten observations back and change the decision. The number ten is chosen due to the fact that the user should stay focused, while judging.

4 Using the Software

4.1 Upload Plot function

This tab controls the upload of the plot function. Here a *.R* script has to be applied that contains all functions and variables that were required to generate the plot. The function that creates the final plot has to be named starting with "plot_". This plot function has to have at least three parameters: *data*, *selected* and *called*. Those are explained below in more detail.

After uploading the *.R* script all functions and variables appear under Plot function to ensure that the right plot function was uploaded.

4.1.1 data

data represents the uploaded dataset and is passed to the plot function. Therefore, not only plots that require information from a single observation can be plotted. Moreover, also plots from columns over the whole dataset can be generated like, for example, a histogram of a certain intensity measure.

4.1.2 selected

selected represents the row that is selected by CindeR to judge at a time. Therefore, *data* could be subsetted with selected for the specific row that is to be judged, and therefore, visualized.

4.1.3 called

called represents a counter of how many times the plot function has been called so far. This can be useful if a plot needs a time demanding processing function of data which is in principle the same every time a plot is generated. The *called* parameter gives than the possibility with a simple *if* case to perform this operation only once and assign a result variable with "«-". This "global" variable can be subsequently used to generate each plot. Therefore, the generation of the plots is quick after the first one, since only during this step the time demanding operations that are similar for all plots, are performed.

4.2 Evaluation

Here the data set that is to be judged can be uploaded. Before uploading the dataset the user has to specify the properties of the *.csv* file. This includes whether there is a header or not, which separator is used and how character strings are quoted. After the upload of the dataset the app adds a new column onto it called "JTarget". This column is initialized with NA at a beginning and if the observation is selected by the app to be judged it is assigned with *TRUE* or *FALSE* according to the user action. The app allows one to go ten plots back and change the decision on one of those ten plots. After switching the decision on

one plot the app returns a currently unjudged plot to continue with the judgment. The order of the observations how they are displayed for judging is random.

The progress indicator displays the progress and shows also the total number of observations to judge.

The download current progress button allows the download of the current progress. This downloaded dataset could be uploaded again and the judgment can be continued.

5 Video tutorial

Video tutorial section list a link to video tutorials that explain how to use CindeR using a example dataset.

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https://youtu.be/xwYTkmQfzxY
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