**BORIS User Guide**

Chris Blanton, Jamie Byrd

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1.BORIS

This section describes the BORIS software and provides an example of how you would use it to code observations.

1.1 Preface

This section reflects installation of software and latest version information.

For installing and launching the latest version of software, please refer to the BORIS website and user guide located online:

<http://www.boris.unito.it/>

<https://boris.readthedocs.io/en/v7/>

Or you can access their user guide from the software:

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This document reflects BORIS version 7.12.2 as of December 2021.

It is important to do regular backups of your project files to prevent the loss of data.

1.2 Introduction

This section provides an introduction for the user to BORIS.

BORIS is an acronym for Behavioral Observation Research Interactive Software used for video/audio coding for logging live events or observations.

BORIS is free software; you can redistribute it and/or modify it under the terms of the General Public License as published by the Free Software Foundation; either version 2, or any later version.

1.3 Key Terms

This section provides many important terms used throughout BORIS that you must understand. The following is a list of key terms and a short definition of each term.

|  |  |
| --- | --- |
| **Term** | **Definition** |
| Ethogram | catalog or inventory of behaviors |
| State events | behavior that happens for a duration of time |
| Point events | behavior that happens at one time for no duration |
| Unpaired events | when a state event does not have a start and end time |
| Behavioral categories | describes type of behaviors |
| Modifiers | attributes to behaviors |
| Subject | object being observed |
| Independent variable | factors that influence behaviors |
| Observation | the codes stored for behaviors |

1.4 Creating a Project

This section describes how to create a new project within BORIS.

Open the BORIS software and this is the first screen you will be prompted with (Figure 1), please wait for it to load.

Note: It is recommended to have a dual monitor for using BORIS.

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Figure 1 - The command prompt screen that will appear the first time you launch BORIS.

You can open a previous project, import a project, or start a new project by clicking “File” in the upper left-hand corner (Figure 2).

You may only open one project at a time, but it can have many observations.

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Figure 2 - The options under the File tab.

To start a new project, you will enter some information about your project (Figure 3).

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Figure 3 - The Information tab to start a new project.

Under the “Ethogram” tab, you can add the behaviors you would like to record by clicking “Add Behavior” (Figure 4).

You can duplicate a behavior by selecting the event and clicking “Clone Behavior” and to delete a behavior select the event and click “Remove Behavior” or you can delete them all by clicking “Remove All Behaviors”.

You can also import behaviors from other projects in BORIS by clicking “Import behaviors from a BORIS project”.

Note: Make sure every state event has a beginning and end or a warning message will be displayed when exporting the data.

Note: in order to correctly execute the collected data to python as demonstrated in this user guide, the user must have at least one of both state and point events.

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Figure 4 - The Ethogram tab to start a new project.

These behaviors can be state or point behaviors, you can change this by double clicking the behavior type (Figure 5). You can dictate which event is coded by which key and add a description, however, a description is not necessary (Figure 6).

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Figure 5 - The types of behavior to select when adding a new behavior.

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Figure 6 - An example of how the screen looks with fully described behaviors.

Under the “Subjects” tab, you also add the subjects you will be focused on by clicking “Add Subject” (Figure 7) and repeating the same process of dictating a key code for each subject you wish to observe (Figure 8).

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Figure 7 - The Subjects tab to start a new project.

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Figure 8 - An example of how the screen looks with fully described subjects.

Under the Independent Variables tab, you can also add independent variables to observe. This can be temperature, time of the day, etc. By clicking “Add Variable” you can create a label, description, change the form from number or text, or set a value (Figure 9).

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Figure 9 - An example of how the screen looks with fully described independent variables with options to select the type of variable.

You’ll see that the Observations tab is empty (Figure 10). Now it is time to add the video, you can always come back later and edit any of this information if needed by going to “File” and then “Edit Project” (Figure 11).

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Figure 10 - The Observations tab to start a new project.

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Figure 11 - The Edit Project option under the File tab.

1.5 Add Observations

In this section you will learn how to add media in order to code the observations.

You can create a new observation or import a previous one by clicking “Observations” (Figure 12).

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Figure 12 - The New Observation option under the Observations tab.

To create a new observation, click “Add Media” and input a title and description for the observation id. You can change the time format of the video here (Figure 13).

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Figure 13 - The screen to start a new observation with title and description.

You can change the user by clicking “Player” and choosing a number to represent each person (Figure 14).

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Figure 14 - The screen to start a new observation displaying options to select which Player or user.

You can start the observation by immediately clicking “Start” or go under the “Observations” tab (Figure 15).

Graphical user interface

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Figure 15 - The Start Observation option under the Observations tab.

You can view all observations created in one place and choose to start, view, or edit them by clicking the “Observations List” (Figure 16). This will display all observations added to the current project (Figure 17).

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Figure 16 - The Observation List option under the Observations tab.

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Figure 17 - The Observation List screen with the example media listed.

This is how it looks when you start the observation. You have many controls to play, pause, and scroll through the video (Figure 18).

Note: It is recommended to pop out the video and utilize dual monitors or the format is depicted in the picture which can be difficult to visualize.

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Figure 18 - The screen once the observation is started. This shows the media at the top with the Ethogram and Subject keys to the left and an empty coded behavior box to the right.

If you choose to open a new observation or edit the project it will prompt you with this message. You must select “Yes” if you want to edit the ethogram, subjects, observations, etc. (Figure 19).

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Figure 19 - The warning prompt to close the current observation.

1.6 Exporting

This section describes how to export the collected data from the user’s coded observations to a csv file.

To export the data, you select “Export Events” under Observations. Then select “Aggregated Events” to correctly execute the data to Python as outlined in this user guide (Figure 20).

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Figure 20 - The Export Events option under the Observations tab where you can select the tabular events.

Here you can select which observations you would like to analyze. You may select one or many (Figure 21).

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Figure 21 - The export screen with the example observations listed to be selected.

Note: If there is data with unpaired state events this warning message will appear (Figure 22).

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Figure 22 - The warning prompt if there are unpaired state events.

You can select which subjects and behaviors you want to analyze as well (Figure 23).

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Figure 23 - The export screen with the example subjects listed to be selected.

Press “OK” and save the exported file with a name and place convenient for you (Figure 24).

Note: You must save it as a CSV file in order to correctly export to Python following this user guide.

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Figure 24 - The save screen in file explorer.

This is how the information will be displayed in Excel (Figure 25).

Note: This will look different if the user has not recorded at least one of both a state and point event. This will cause the code to crash if the CSV file is not in correct format.

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Figure 25 - The example csv file data in Microsoft Excel.

2. Python

2.1 Preface

This section reflects installation of software and latest version information.

Note: We assumed the user has a basic understanding of how to use Python.

\*\*Installation notes for Anaconda and Jupyter here.

2.2 Code

Upon successful installation of the Anaconda program, begin with opening Jupyter notebook and creating a new notebook. Create the following input in the top cell.

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3. References