

# ROI (Region Of Interest) Selection Tool

This is the user guide for the **ROI Selection Tool**, a research analysis tool developed in the context of the **IEMP (Interpersonal Entrainment in Music Performance) project** (<https://musicscience.net/projects/iemp/>) by Casa Paganini-InfoMus research team in collaboration with Durham University and the MARCS Institute of Western Sydney University. The **ROI Selection Tool** was originally conceived for supporting research on automatic analysis of body movement in nonverbal communication contexts.

The ROI Selection Tool runs on the **EyesWeb XMI Platform** (version 5.7.0.0) that can be downloaded from:

[ftp://ftp.infomus.org/Evaluate/EyesWeb/XMI/Version\\_5.7.x/EyesWeb\\_XMI\\_setup\\_5.7.0.0.exe](ftp://ftp.infomus.org/Evaluate/EyesWeb/XMI/Version_5.7.x/EyesWeb_XMI_setup_5.7.0.0.exe)

The **ROI Selection Tool** (together with the **Video Tracker Tool**) is a piece of software that allows the user to:

- Run through a selected video dataset.
- Define, for each selected video, two or more ROIs: regions of interest (i.e., selected subsets / areas of pixels within the video frames that could each contain individual people or objects to be tracked).
- Extract, from each video, several time segments to be analysed, avoiding non-significant segments.
- Export the metadata that contains all the information about the ROIs and the time segments.

Such metadata can be used as input to the **Video Tracker Tool**. The **Video Tracker Tool** is used to

- apply, various automated tracking techniques (see the *Video Tracker Tool Guide*) to each extracted segment and each defined ROI
- extract and write the results

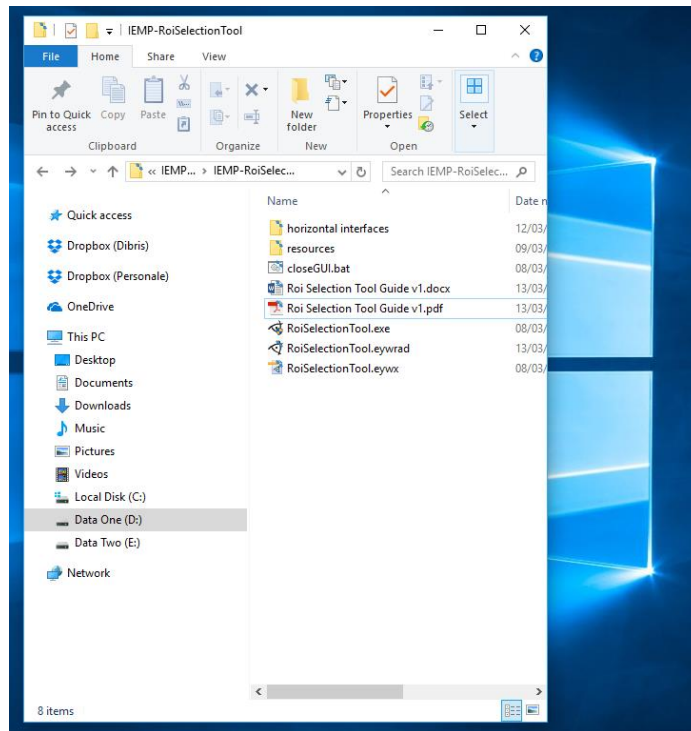
Important Note:

There are two version of the interface of the ROI Selection Tool. The default interface is vertical. Due to screen resolution problems we created an horizontal version of the same interface. If experience visualization problems:

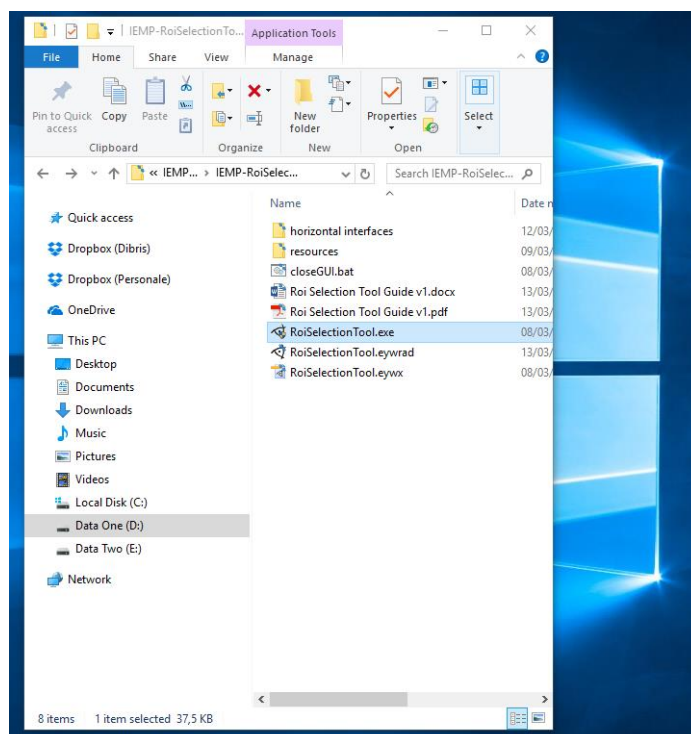
- 1) Go to the IEMP-ROISelectionTool\Horizontal Interfaces
- 2) Copy the file "ROISelectionTool.eywrad
- 3) Replace the file in the IEMP- ROISelectionTool with the original one

# User Guide:

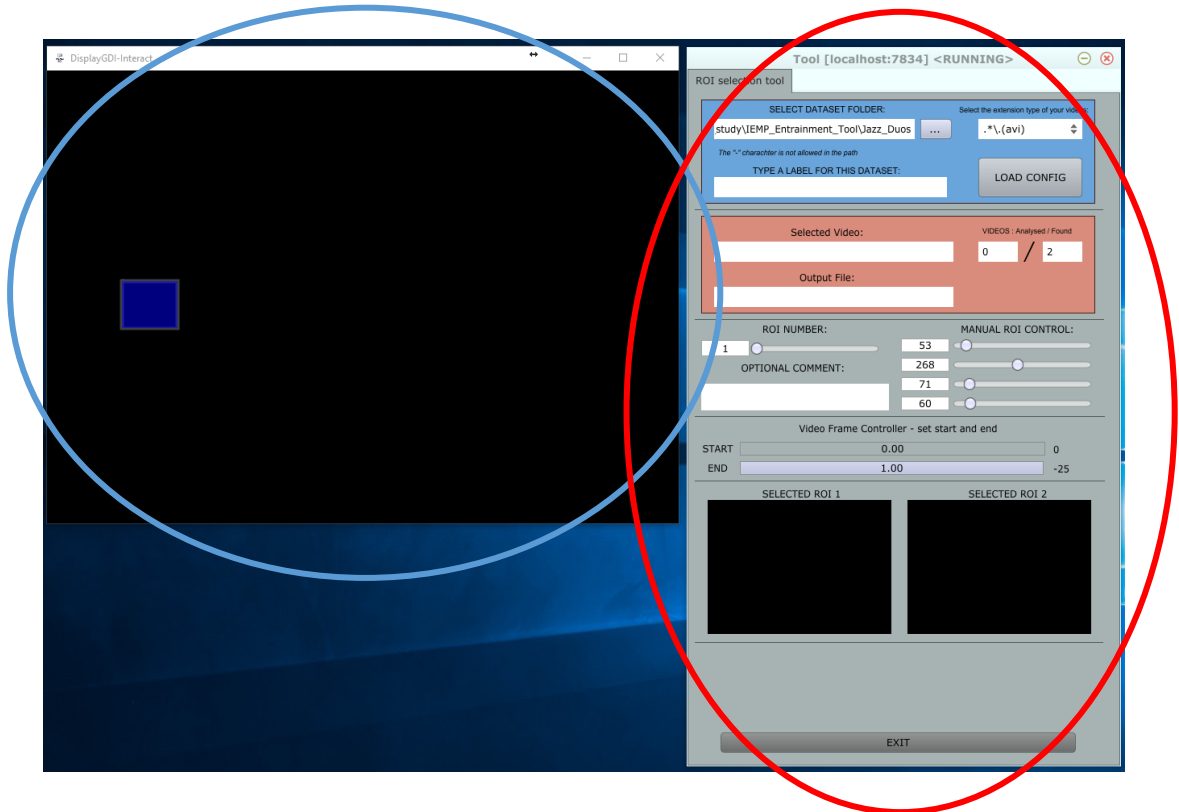
- 1) Open the *IEMP-ROI-Selection Tool* folder:



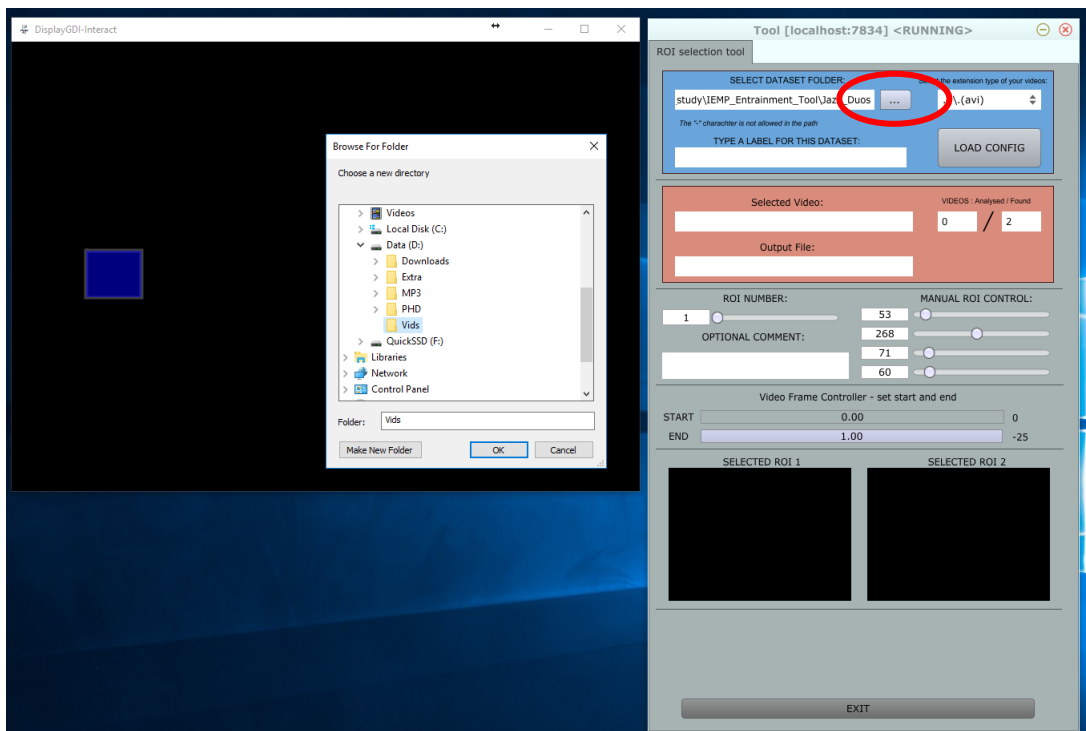
- 2) Run *RoiSelectionTool.exe*:



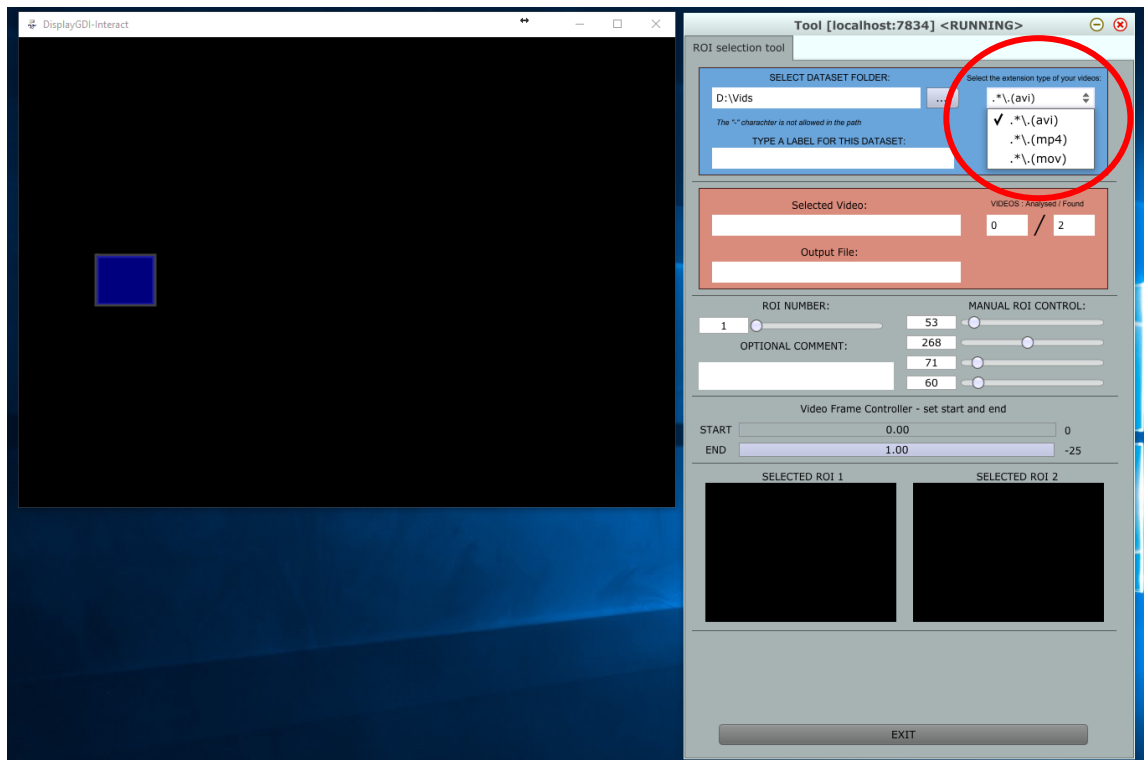
- 3) The tool will display two main windows:
- A control panel window (on the right, red circle)
  - A ROI selection window (on the left, blue circle)



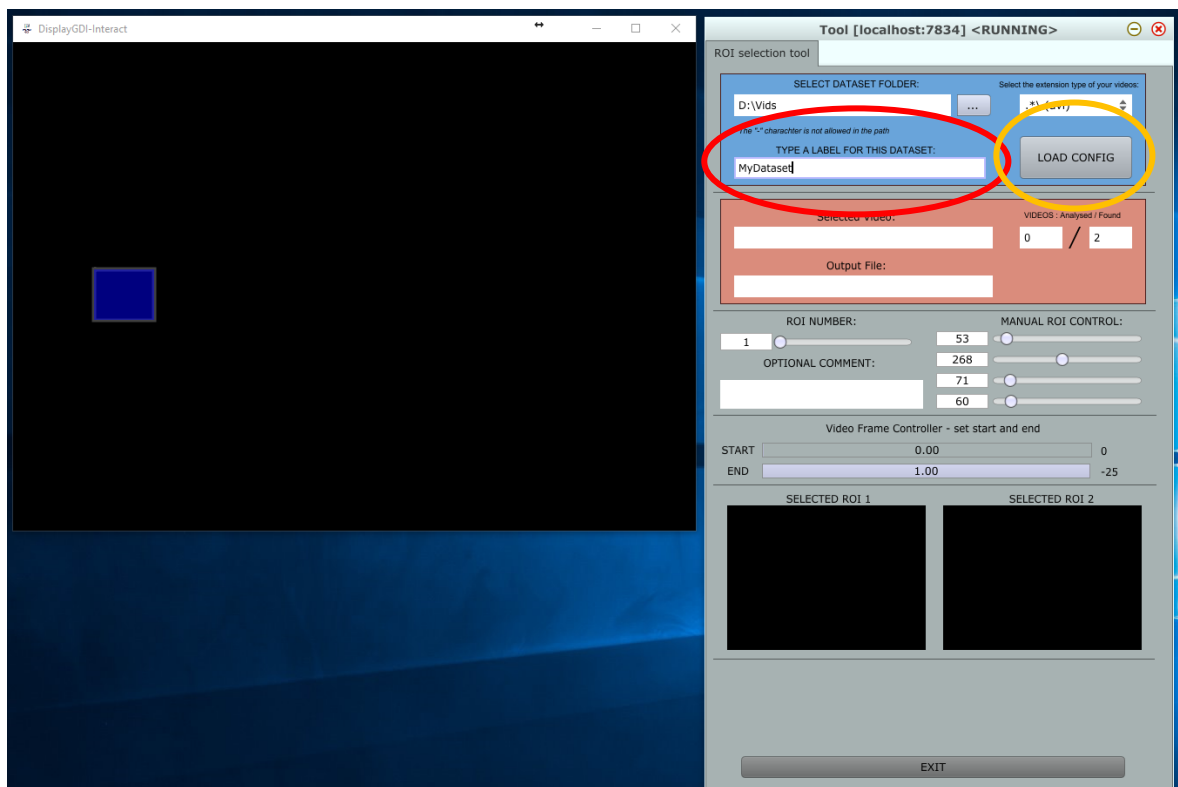
- 4) Click on the "[...]" button and select the folder that contains your video dataset:
- in our example the dataset is located in "D:\Vids\"



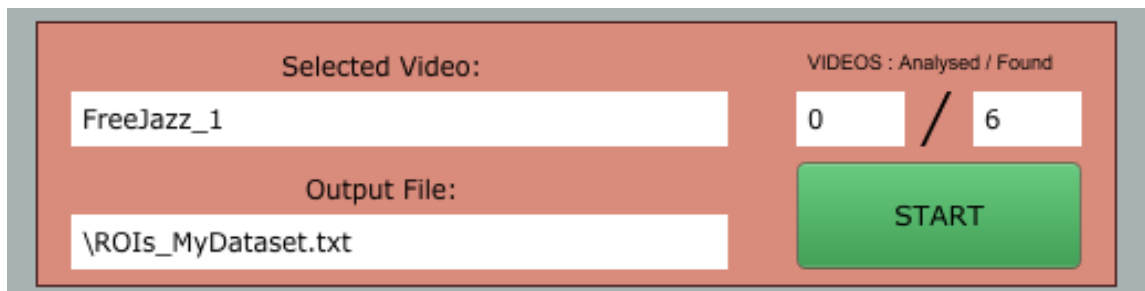
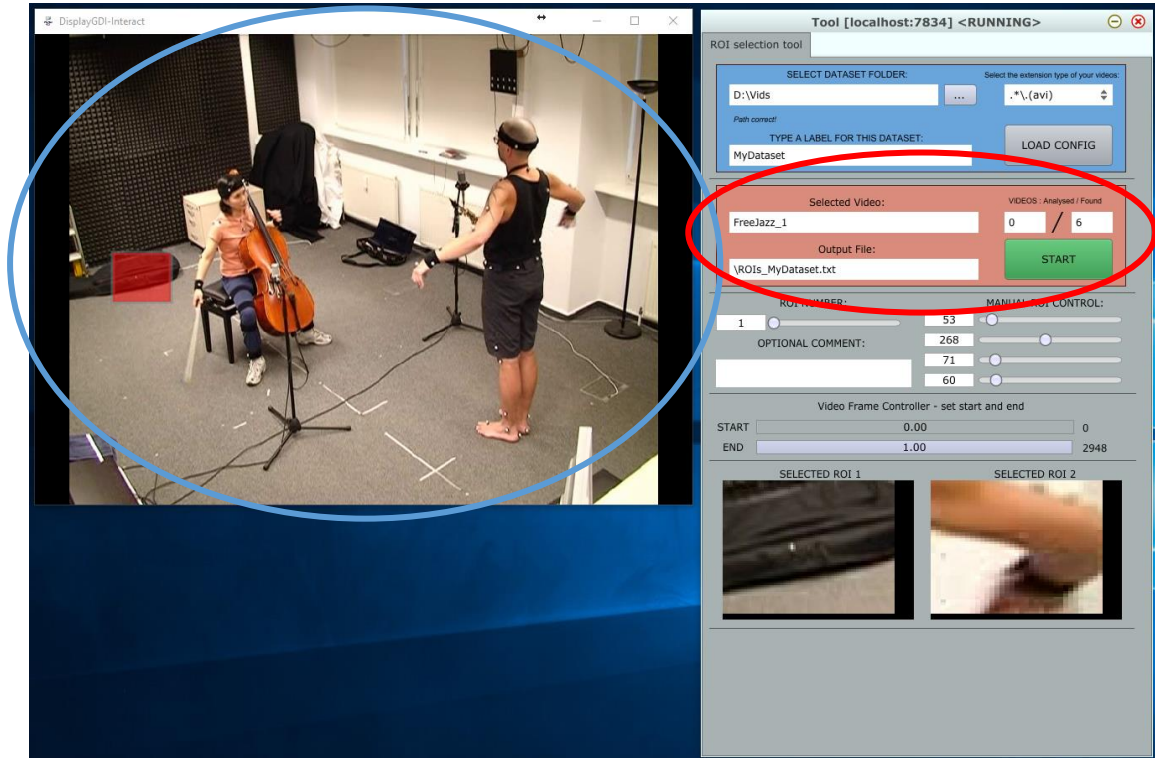
- 5) Select the extension of your dataset videos from the *Extension mask* (now only three video extensions are available but more will be provided in the next versions of the tool).
- In our example we are selecting a collection of *.avi* files



- 6) Type a *label* for your dataset and press the “**LOAD CONFIG**” button (in yellow)
- In our example the label is: “*MyDataset*”



- 7) By loading the configuration, the tool will display:
- The first frame of the first video of your dataset (sorted in alphabetical order). This will appear in the *ROI selection window* (blue circle)
  - Information about the session status that will appear in the red section of the *control window* (red circle):



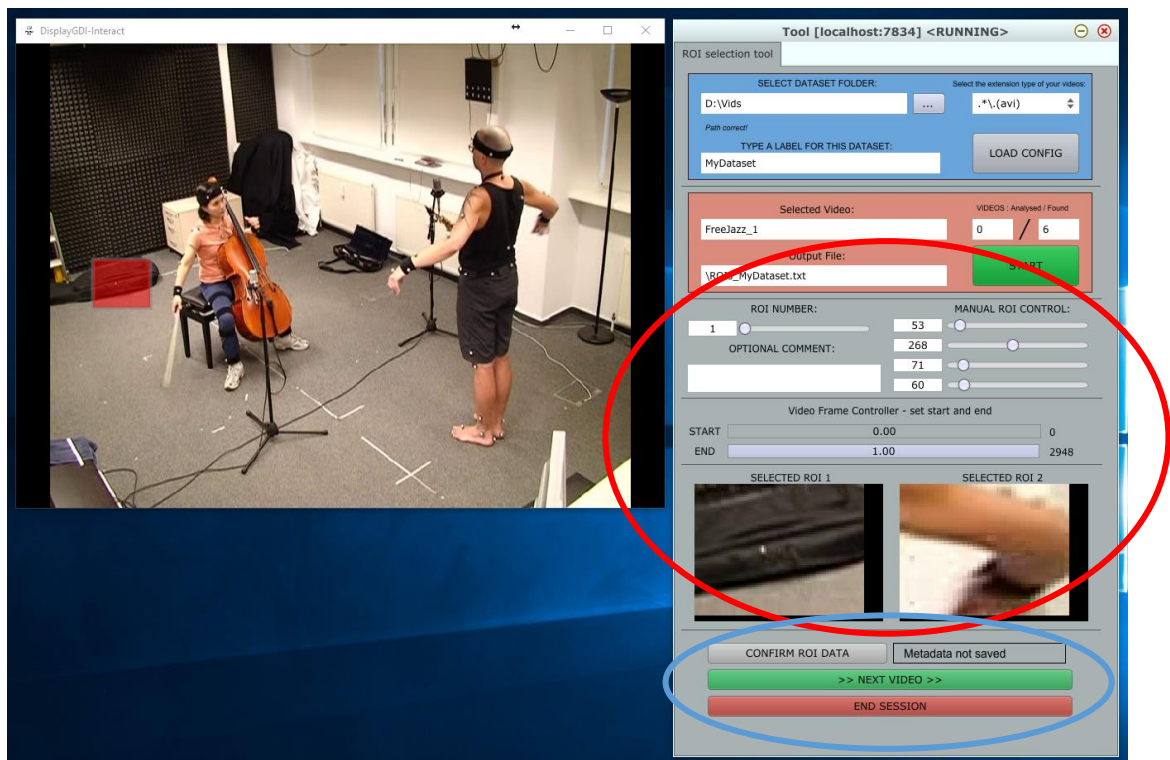
Information about the session status explained:

- The **name** of the selected video.
- The **number** of Found Videos and how many of them have already been Analysed.
- The **output path** to the metadata file that will be written at the end of the session.

Finally, a green “**START**” button appears. By pressing it, we can start defining the ROIs on the loaded video.

- 8) Once the “**START**” button is pressed:
- Some **buttons** will appear at the bottom of the *control window* (blue circle)
  - The “**Exit**” button will disappear

Now, let’s focus on the controls (highlighted in the red circle in the figure below) that are going to be used in the next two steps: “**ROI Definition**” and “**Video Frame Control and Segmentation**”.

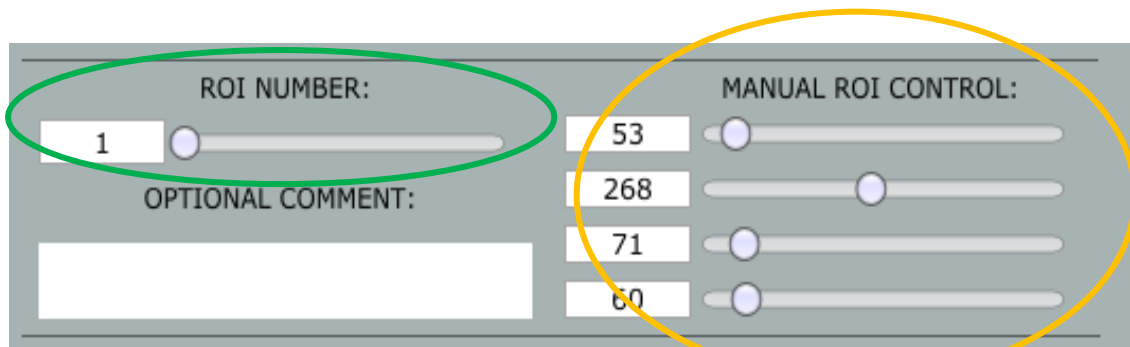


### ROI Definition:

First of all, by using the “**ROI NUMBER**” slider (green circle), please select the **ROI number that you are going to define** (in this version only two ROIs are allowed, but this tool can potentially work on up to six ROIs, to allow, for example, for group analysis).

You can now define a ROI in **two** ways:

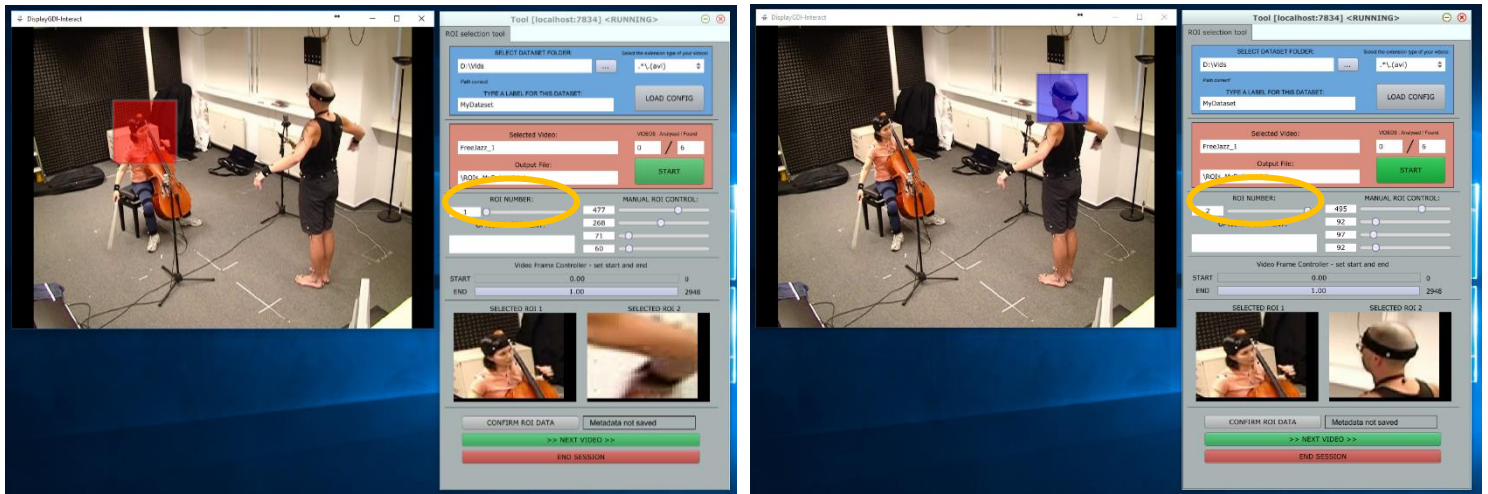
- By interacting with the sliders available in the “**MANUAL ROI CONTROL**” section (yellow circle)  
The sliders controls: **X**, **Y**, **Width** and **Height** of the selected ROI.
- By drawing an area (with your mouse) directly on the *ROI selection window* i.e., on the displayed video frame





If **a)** is performed, a **blue** rectangle will be shown as feedback on the *ROI selection window*  
 If **b)** is performed, a **red** rectangle will be shown as feedback on the *ROI selection window*

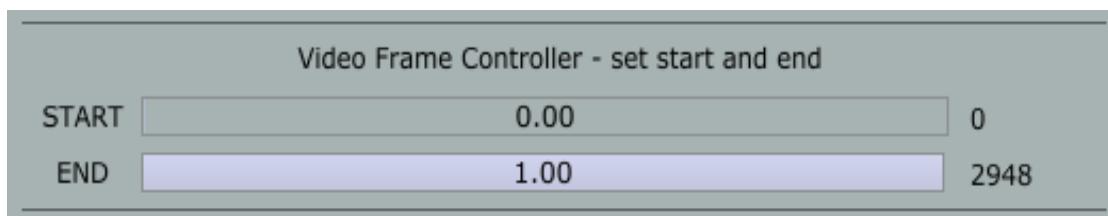
Tip: Remember to change the “ROI NUMBER”



- After each **a)** or **b)** the defined ROI will be shown in the two small displays “**SELECTED ROI 1**” and “**SELECTED ROI 2**” in the *control window* (yellow circles in the figures above).
- Additionally, you can write a comment that will be stored in the result file. Type it in the “**OPTIONAL COMMENT**” text field.

### Video Frame Control and segmentation:

**Video Frame Control:** Let’s say that you want to check if the ROIs you have defined are well matching / containing the subject/object you are trying to track during the whole video. The ROI Selection Tool allows for checking **how the content of the ROIs evolves** during the course of the whole video. By moving one of the two sliders (“**START**” or “**END**”), the corresponding video frame will be displayed on the *ROI Selection window* together with the “**SELECTED ROI 1**” and “**SELECTED ROI 2**” content.



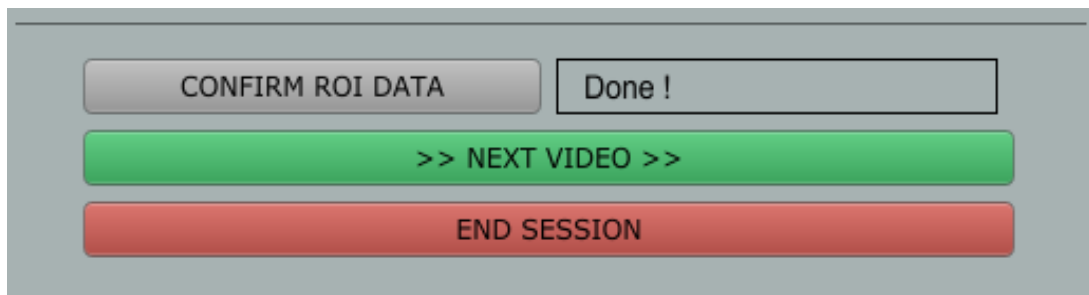
**Segmentation:** It might not be necessary to **analyse the entire video** (see the **Video Tracker Tool** guide), e.g., you want to cut an initial or ending part that is not interesting for your analysis, or you want to extract a central part. The ROI Selection Tool allows you to define the “**START**” and the “**END**” frames of the video that you want to analyse. By default, “**START**” is set to the first frame and “**END**” is set to the last frame of the current video. Is possible to perform several segmentations on the same video. Every time a new video is loaded, the frame length will be computed and “**START**” and “**END**” are set to default.



- 9) When you are satisfied with the ROIs you have defined, just press **“CONFIRM ROI DATA”**. Text feedback will appear if the ROI data have been written successfully.

Now you can:

- Skip to the next video to process, by pressing the **“>> NEXT VIDEO >>”** button and repeat again with Steps (9) and (10).
- Conclude the session by pressing the **“END SESSION”** button.



If **b)** is performed, the **“EXIT”** button will re-appear. Use it to close the ROI Selection Tool, or start again by loading another dataset and go back to Step (4).

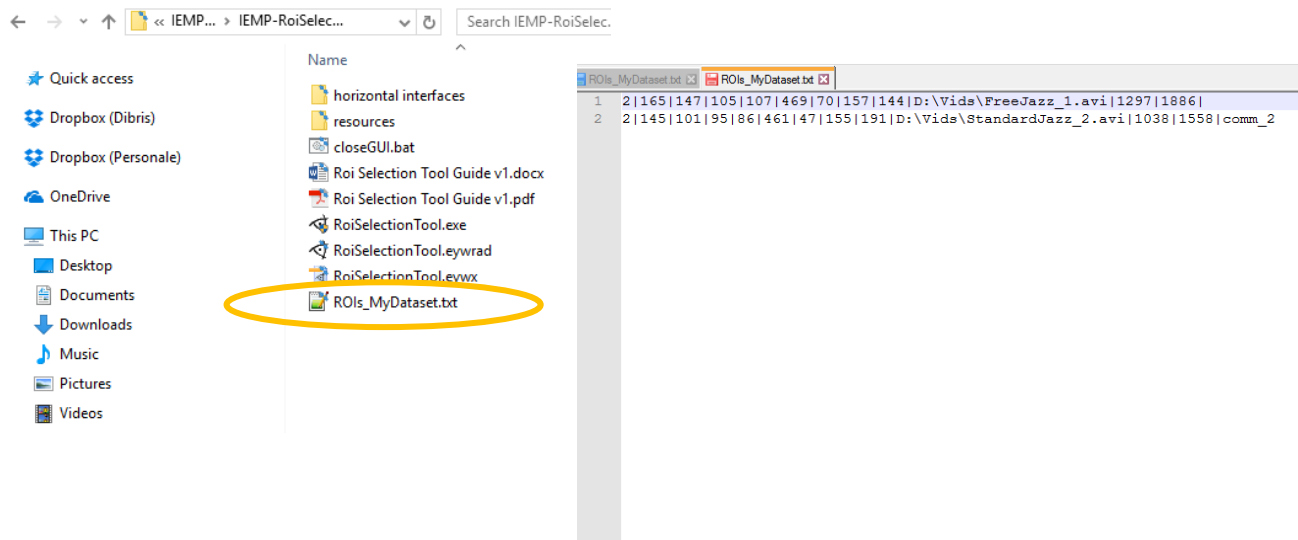


## Output of the Tool:

For each session a new .txt file will be generated with the following name structure:

*ROIs\_“label”.txt*

In our example, the label “MyDataset” is used. According to the **output path** shown in Step (7):



The information stored in each file is structured as follows, and can be used as input to the **Video Tracker Tool**.



For each video or video segment there will be a new row in the output file.