# Video Tracker Tool

This is the user guide for the **Video Tracker 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 **Video Tracker Tool** was originally conceived for supporting research on automatic analysis of body movement in nonverbal communication contexts.

The Video Tracker Tool takes as input a file created by the ROI Tool, in which relevant regions of interest have been selected from a video or set of videos (e.g. individual performers). It 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

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

- Import and read ROI's metadata files (that are generated by the **ROI Selection Tool**)
- Apply to each loaded video or video segment, various automated tracking techniques to the ROI contents
- Configure the parameters of the tracking techniques
- Extract the results.

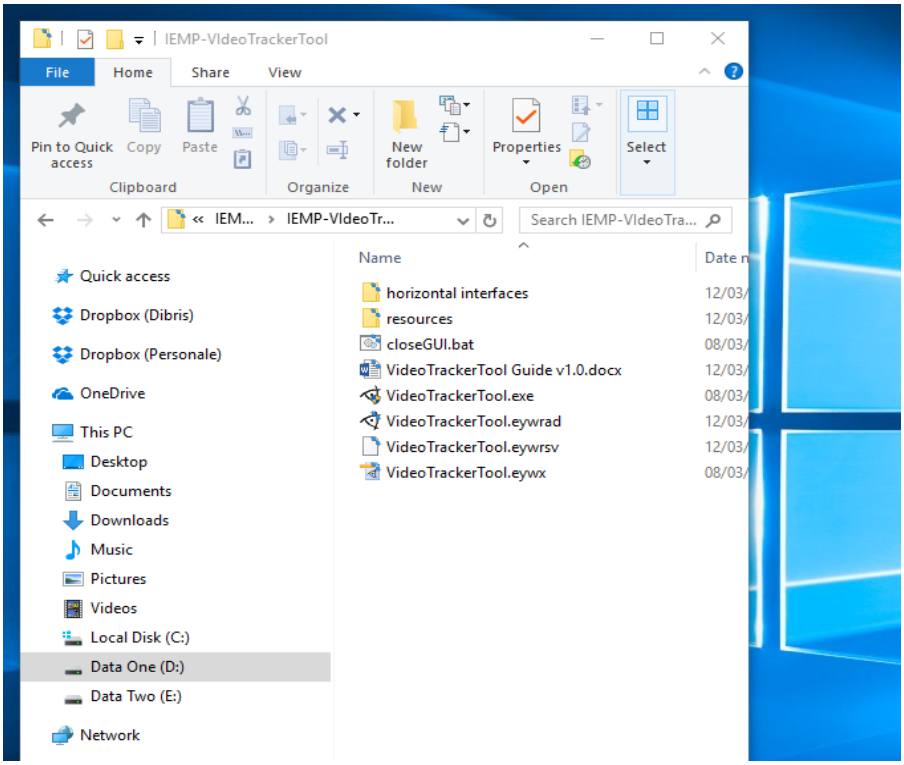
Important Note:

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

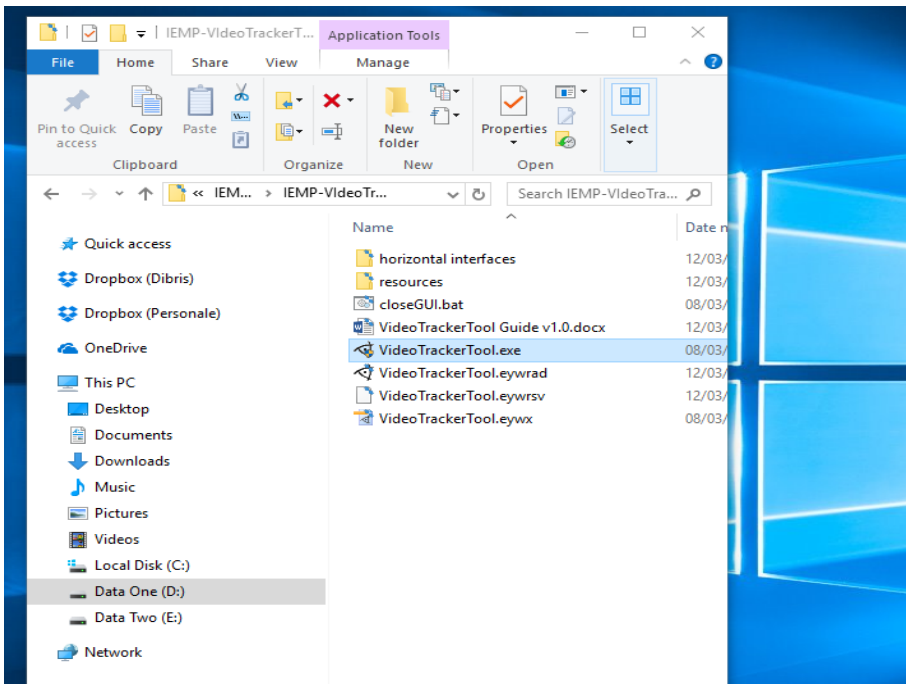
1) Go to the IEMP-VideoTrackerTool\Horizontal Interface
2) Copy the file "VideoTrackerTool.eywrad
3) Replace the file in the IEMP-VideoTrackerTool with the original one

# User Guide:

1) Open the *IEMP-VideoTrackerTool* folder:



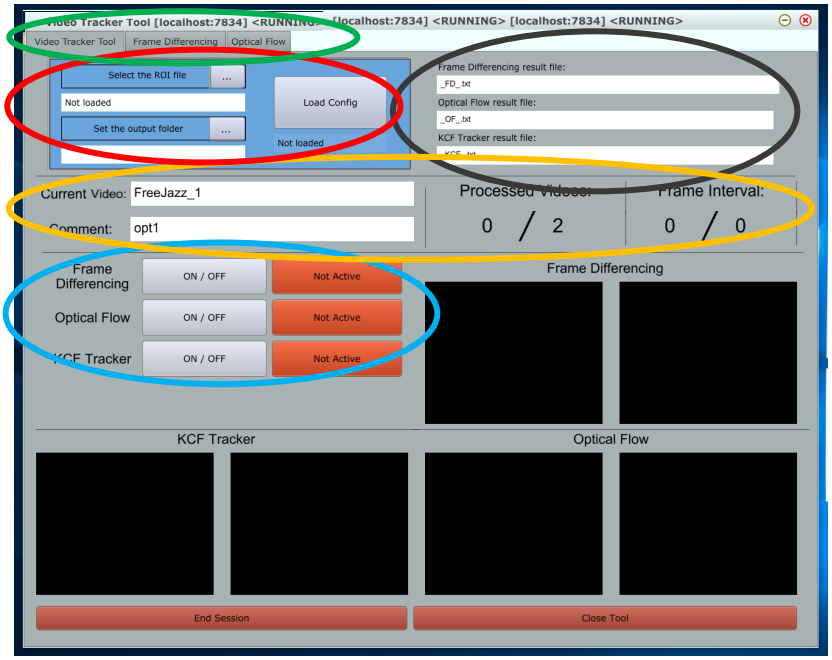

2) Run *VideoTrackerTool.exe*:



3) The tool will display a single window:

**Video Tracker Tool's Tab Areas:**

- Tabs (**green** circle)
- Configuration (**red** circle)
- Output Files Path (**black** circle)
- Current Tool Status (**yellow** circle)
- Tracking Techniques Control (**blue** circle)
- Techniques Output Displays



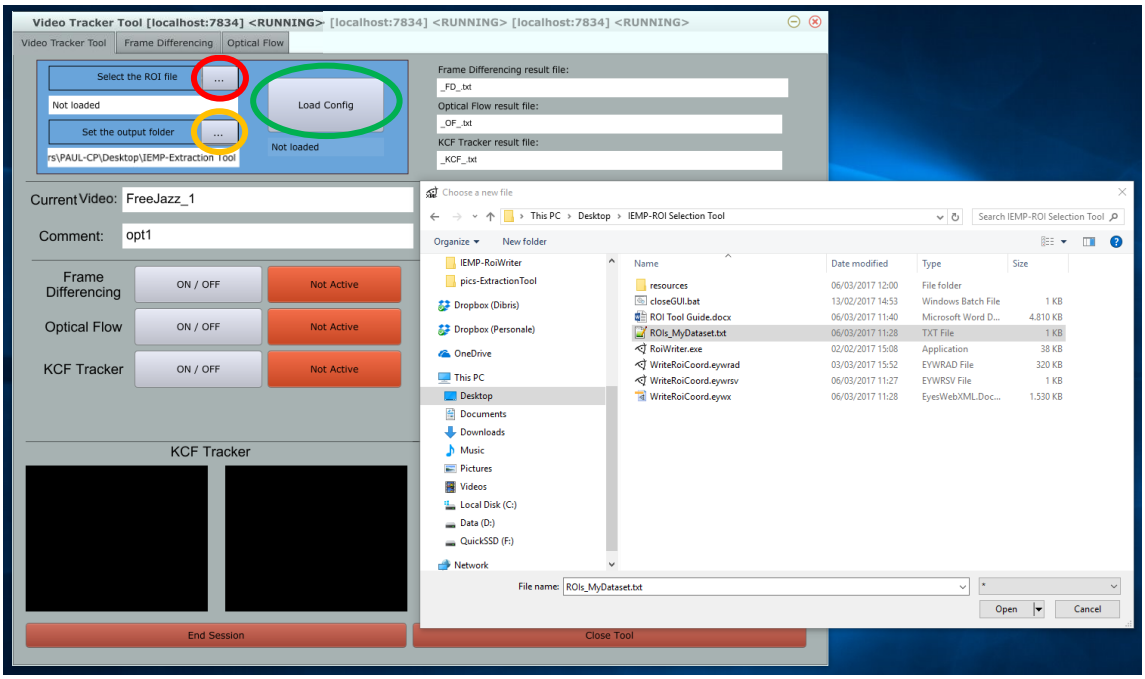

**Tabs** (**green** circle):

- Video Tracker Tool
- Frame Differencing
- Optical Flow

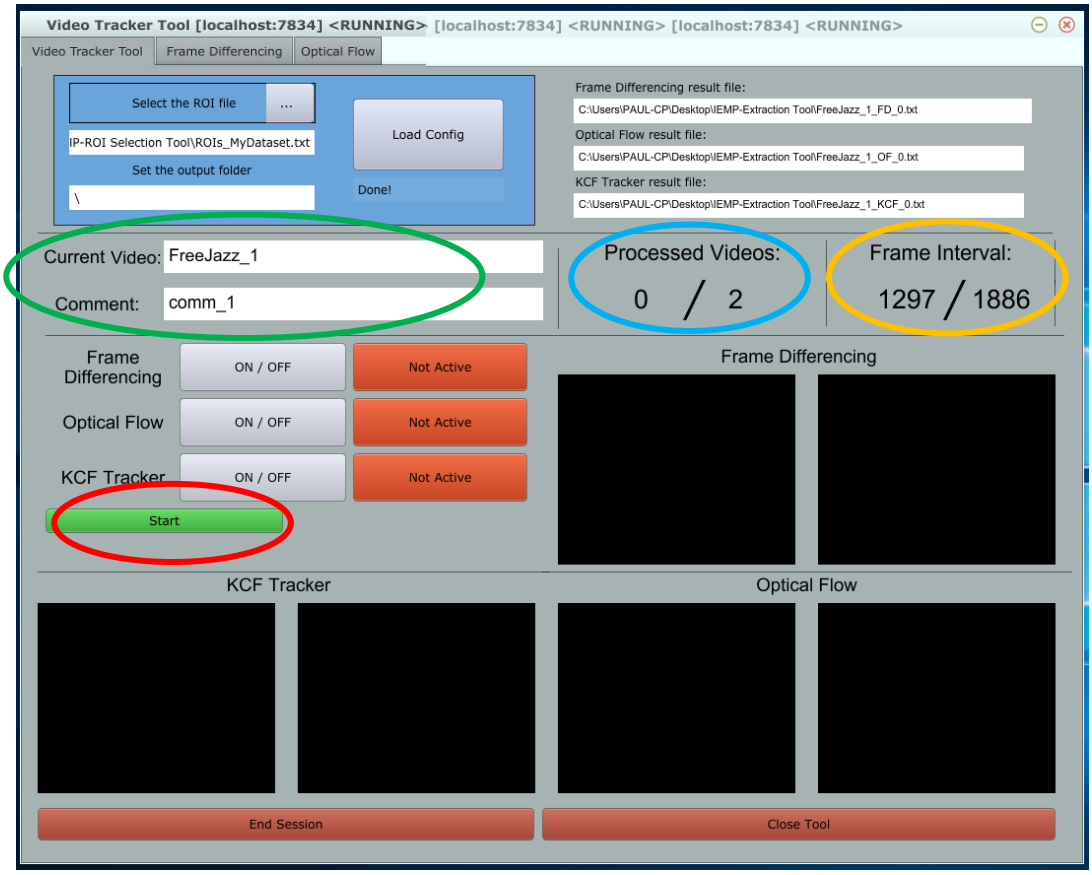
4) Click on the "**[…]**" button (in the **red** circle) and select a ROIs metadata *.txt* file related to your dataset that has been generated with the ROI Selection Tool.
   - In our example we are selecting the *ROIs_MyDataset.txt* file

   Click on the "**[…]**" button (in the **yellow** circle) and select an output folder in which to store your results.
   - In our example we selected the **Video Tracker Tool** path.

   To complete the configuration press the "**Load Config**" button.



5) By loading the configuration, the tool will display:

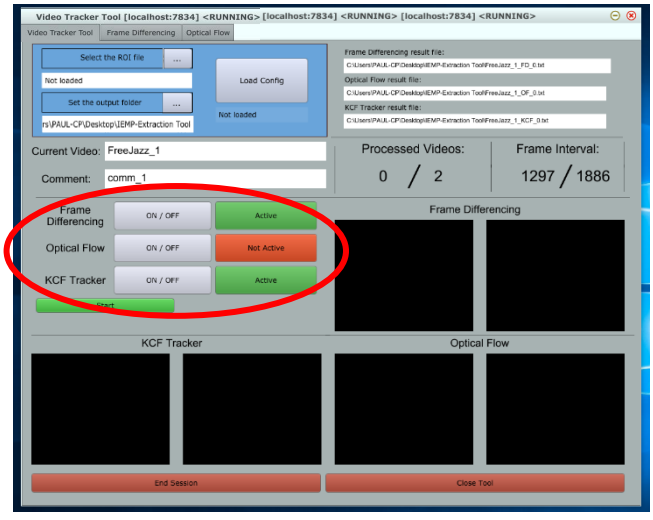



- Information about the session status:
  - The **name** and the saved **comment** of the first video corresponding to the first row in the ROI's metadata file (**green** circle)
  - The **total number of videos (or video segments)** found in the ROI's metadata file (**blue** circle)
  - The **frames interval** (the start and the end) of the segment that is going to be analysed (**yellow** circle)

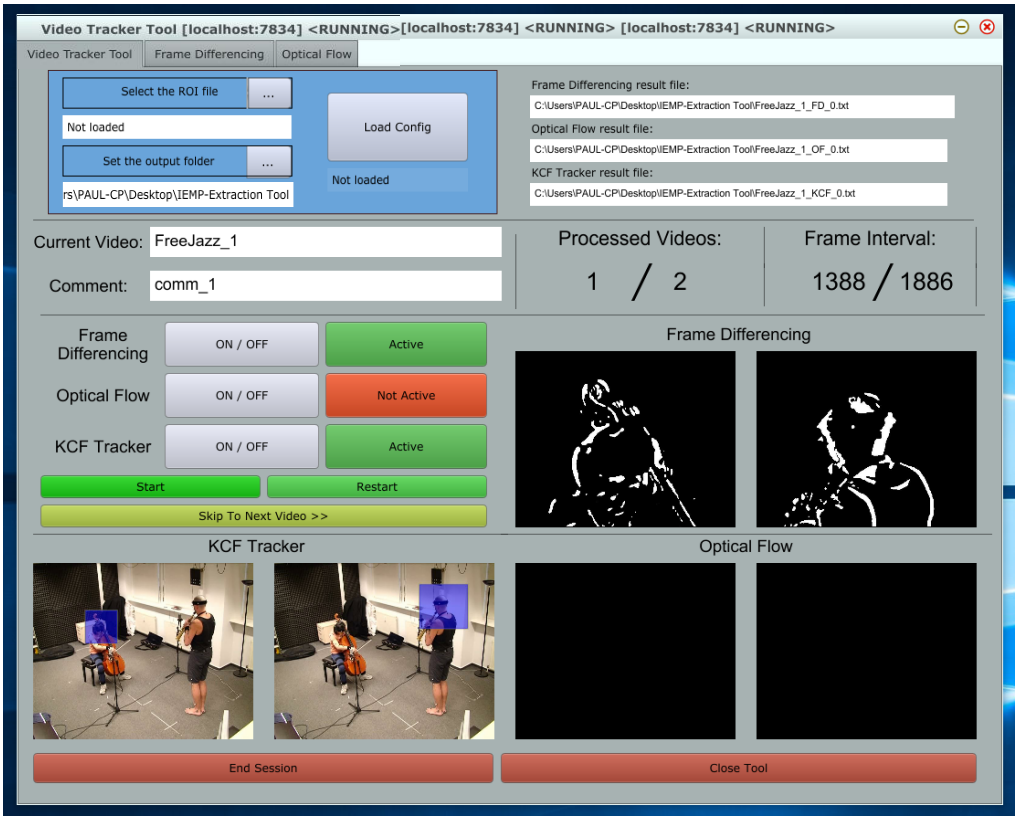
- The "**Start**" button (**red** circle)

6) Activate the analysis techniques you want to apply:

- In this example we activate:
  - *Frame Differencing*
  - *KCF*



7) Press the "**Start**" button. The tool will begin to perform the analysis. The Techniques Output Displays will start to show visual feedback:




The tool will automatically process all the videos (or segments)

- During the analysis process some **interactions** are possible:
  - **Activate or Disable** one or more **tracking techniques** (if you change one of them, you need to restart the analysis otherwise the new choice will be applied from the next video)
  - **Restart** the analysis from the first video with the "**Restart**" button
  - **Change some parameters** of the Frame Differencing and Optical Flow techniques. If you want to use the new parameters from the beginning of the analysis, please restart.
  - Skip to the next video pressing the "**Skip to Next Video"** button
  - End the current session by pressing the "**End Session**" button

Once the "**End Session**" button is pressed, the "**Load Config**" button will reappear and another ROIs metadata file can be loaded for the next session.

*Tip:* if you plan to perform **several analysis sessions**, is better to create a new results folder for each session and set the path every time in the *Output Folder* (see Step 4) so that you do not risk overwriting your results.

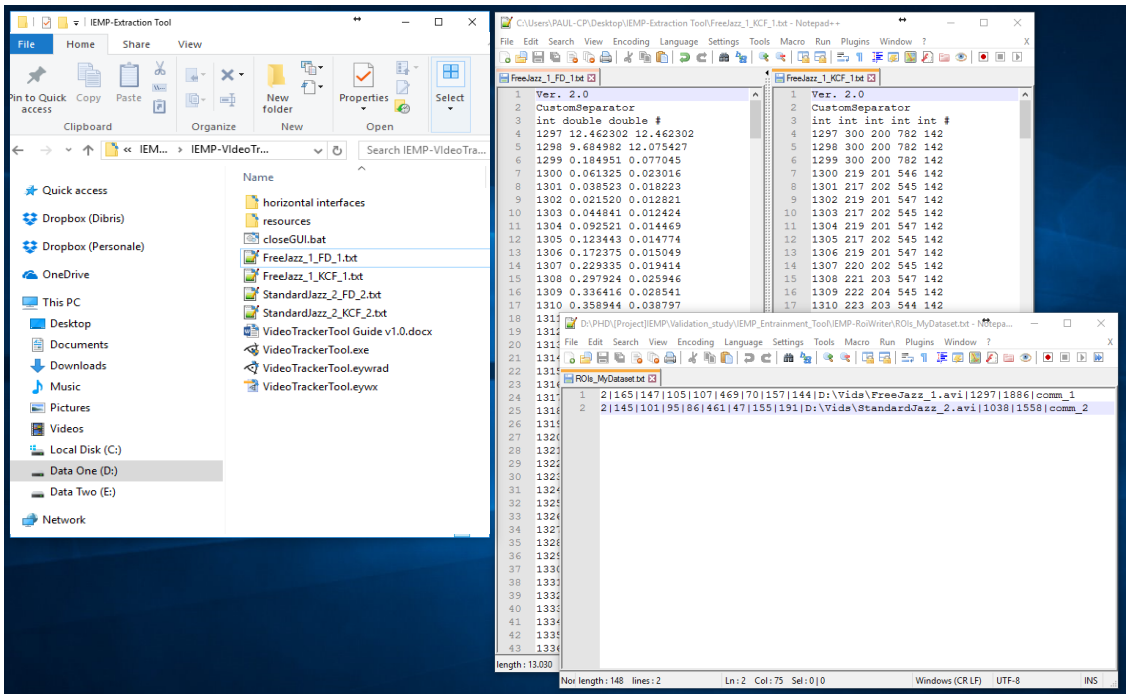
8) Results files are written with the following protocol:
   - For each video (or segment) we can have at maximum three files, one for each technique:
     - NameOfVideo_TechniqueCode_IncrementalNumber

   - In our example the name of the first video file was:
     - *"FreeJazz_1"*

     The results files are:

     FreeJazz_1_FD_1.txt

     FreeJazz_1_KCF_1.txt



# Results Format:

**Frame Differencing (FD)** files are structured as follow:

---

*Ver. 2.0*

*CustomSeparator*

*int double double #*

***FN QOM1 QOM2***

---

Where (from left to right):

FN: Frame number

QOM1: Overall Quantity of Motion (computed based on the number of pixels that change in the foreground from one frame to the next) on ROI 1

QOM2: Overall Quantity of Motion (computed based on the number of pixels that change in the foreground from one frame to the next) on ROI 2

**Optical Flow (FD)** files are structured as follow:

---

*Ver. 2.0*

*CustomSeparator*

*int double double double double #*

***FN BAR1_X BAR1_Y BAR2_Y BAR2_Y***

---

Where (from left to right):

FN: Frame number

ROI 1's barycentre position (x-horizontal and y-vertical coordinates).

ROI 2's barycentre position (x-horizontal and y-vertical coordinates).

**Kernelized Correlation Filters (KCF)** files are structured as follow:

---

*Ver. 2.0*

*CustomSeparator*

*int double double double double #*

***FN BAR1_X BAR1_Y BAR2_Y BAR2_Y***

---

Where (from left to right):

FN: Frame number

ROI 1’s barycentre position (x-horizontal and y-vertical coordinates).

ROI 2’s barycentre position (x-horizontal and y-vertical coordinates).