

SmartDetector: User Manual

Introduction

This manual provides detailed instructions on how to use the features available on our website (<https://plavimop.prd.fr/multipose-react/build/>). The website processes video files to detect different types of movement (facial expressions (face), fine motor movements (upper body and hands), and gross motor movements (whole body)) and automatically creates animated sequences of points representing various joints (point-light display, PLD, Johansson 1973). Users can upload videos, select options, and download the processed videos along with the associated data.

Main features

1. Video processing.
2. Detection of key joints involved in performing various actions (gross motor skills, fine motor skills, and facial expressions).
3. Real time video detection using a webcam.
4. Data management and download (PLD, video, joint coordinates)

1. Detection page overview

On the detection page, users will be greeted by a simple interface allowing them to select various features:

- Video Detection: Designed for pre-recorded videos processing.
- Webcam Detection: Designed for real-time video processing using the webcam.

Navigation

- Tabs for Video Detection and Webcam Detection: These tabs help users to switch between detection methods based on their needs.

2. Best practices for video recording

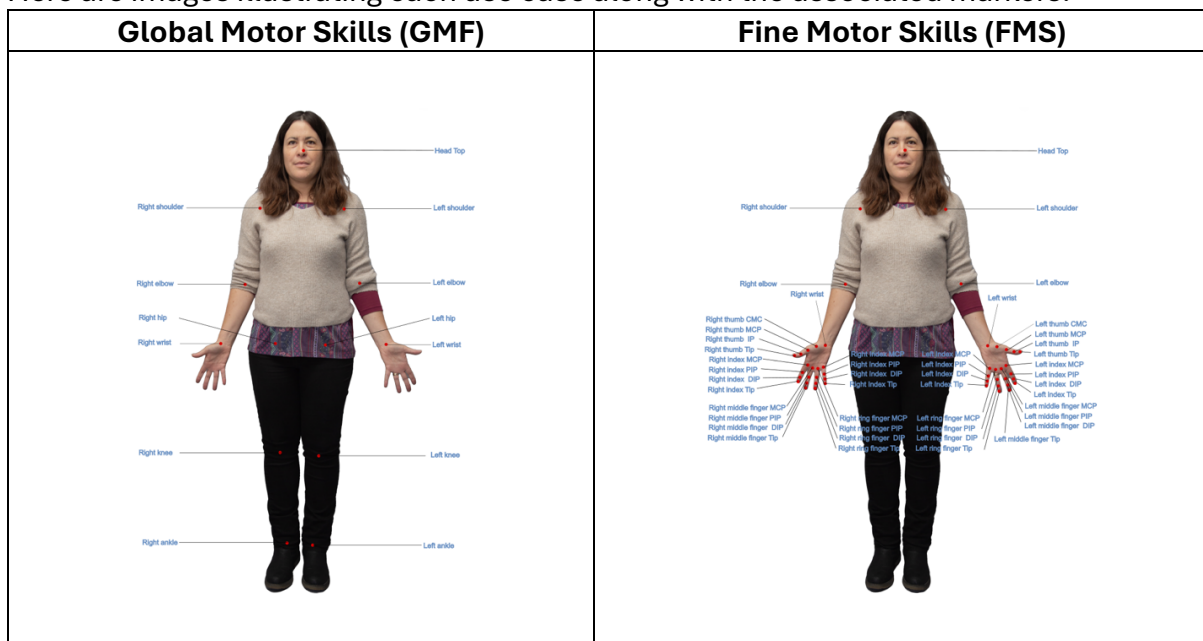
- The camera should be stationary (for example, if possible, use a tripod when using a smartphone or a camera).
- Avoid fast movements for fine motor and facial expression detection.
- For better results, a front-facing shot is recommended.
- For facial and hand detection, the subject should be within 2 meters of the camera.

3. Video loading and processing

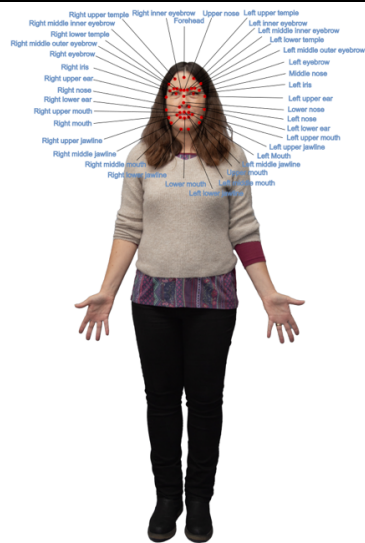
- **First step: video loading**
 - **Button:** "Load video"

- **Action:** Click on "Load video" to select and load a video file from your device. The video format should be MP4.
- **Step 2: option selection**
 - **Options:**
 - Add metadata: allow to add metadata such as name or age of the subject.
 - Global Motor Skills: detection of key joints across the entire body.
 - Fine Motor Skills: detection of upper body joints and fingers.
 - Facial expression: detection of key facial landmarks.
 - **Action:** Select one or several options depending on your needs in the uploaded videos (see below for a description of the tracked points depending on the selected options).

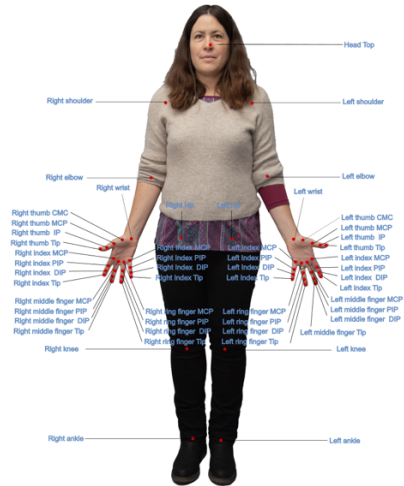
Here are images illustrating each use case along with the associated markers:



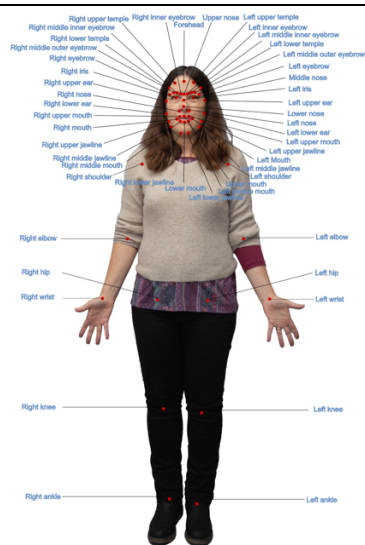
Facial expression (FE)



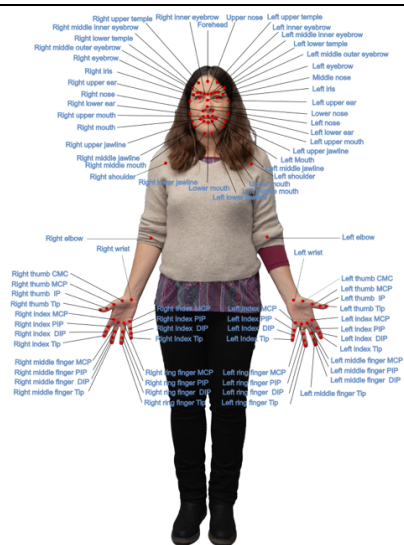
GMS & FMS

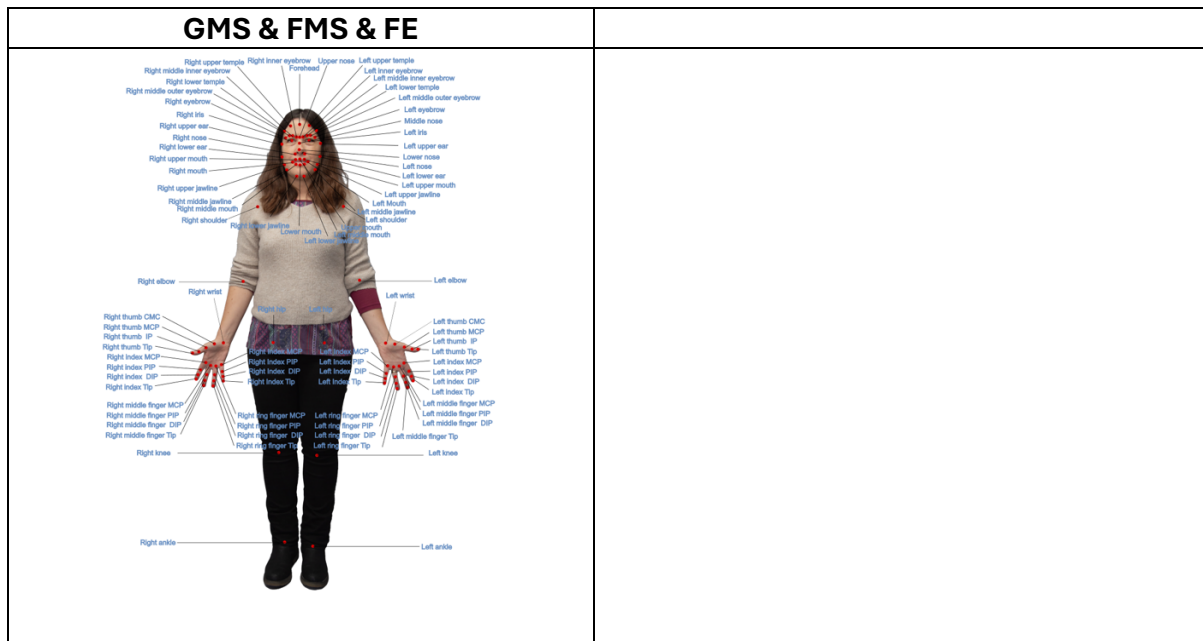


GMS & FE



FMS & FE





- **Step 3: Video processing**
 - **Button:** "Start estimation"
 - **Action:** Once the options are selected, click this button to start the detection process. The website will process the video based on the selected options.
- **Step 4: Download data**
 - **Options:** After processing, download the processed videos and data: (either the video and the PLDs, either the PLDs only), PLDs coordinates as CSV and metadata. The CSV file could be converted as a C3D file in PLAVIMOP software (<https://plavimop.prd.fr/index.php/en/software>) to edit PLDs (masks, point colours, etc).
 - **Button:** "Export" each available file (videos, CSV, metadata).

4. Real time PLDs detection

- **Detection commands:**
 - **Start the estimation:** Starts the video detection process using the device's camera.

Note: The real-time detection feature available on the website is intended as a demonstration. For higher-quality real-time detections and access to additional features (such as video recording and PLD), we encourage you to download the SmartDetector 2 software directly to your computer (<https://plavimop.prd.fr/fr/automatic-creation-pld>).

5. Data and metadata management

- **Data storage**

- The system stores the detected information in CSV files, which can be downloaded after processing.
- **Metadat**
 - Metadata, if generated, are stored in JSON format. This file contains detailed information about the processed video.

6. User interface tips

- **Reactive design:** The user interface (UI) is designed to be responsive, ensuring compatibility with various devices, including tablets and smartphones.
- **Loading indicators:** During video processing, a loading indicator will be displayed to show that the operation is in progress.
- **Video Playback:** Users can preview both the original and detected videos directly on the page.

7. Technical information

- **Dependency**
 - React.js: frontend Framework for the UI.
 - Reactstrap: library for UI component such as button and container.
 - Mediapipe: for landmarks detection of human bodies.

Conclusion

This manual provides a comprehensive guide to using the features of the website. If users encounter issues, they should refer to the error messages or contact support for assistance or information(<https://plavimop.prd.fr/index.php/en/contact>). The design ensures that even users with minimal technical knowledge can use the site effectively.