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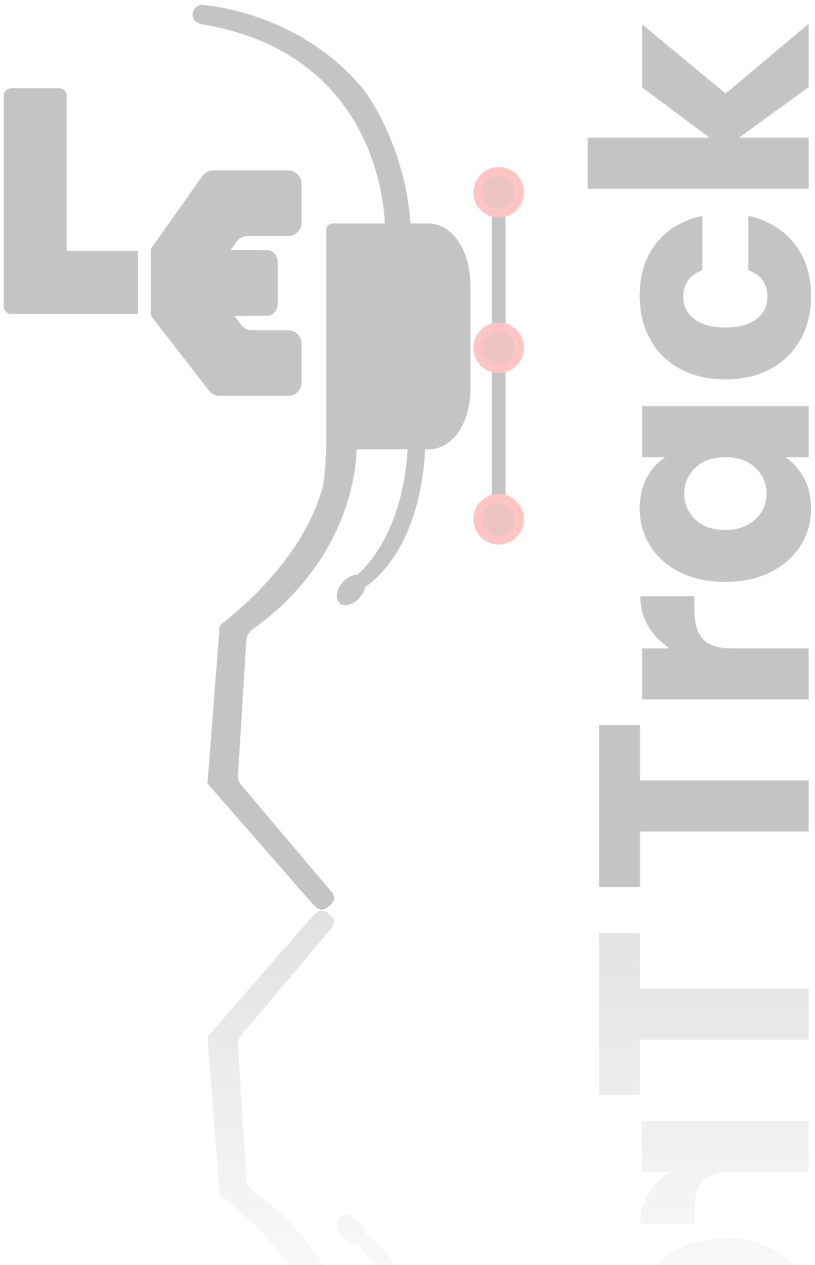
Setup and Configuration guide for LEDTrack



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Introduction

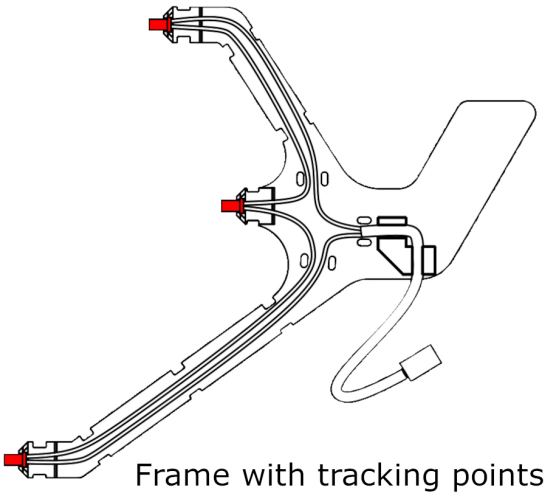
How it works

In short, a computer program tracks the movement of tracking points, filters it and translates it into the game, based on user-defined settings.
To ensure proper headtracking, you'll need to configure the tracking software, adjust the webcam image, mount a light filter to your webcam and securely attach the frame with tracking points to the user's headphones. It may sound like a lot at first, but don't worry - this manual will guide you through the entire setup process and explain clearly what needs to be done and why. The required software is free and publicly available.

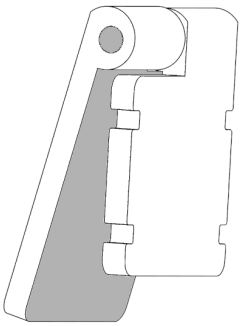
What you will need

This manual assumes that the user already owns a computer and the standard peripherals needed to operate it, so I will focus only on the components used with LEDTrack.
The most important of these is the webcam. A resolution of 1920×1080 is recommended. Resolution of 1280×720 will work as well, but with reduced tracking precision. The webcam should also support manual focus. You will also need a pair of headphones with a surface suitable for attaching the frame with tracking points, or some other way to place the frame next to your head. Included in the set are a light filter and a filter holder for mounting the filter onto the webcam.
An adjustable joint is also available as an optional accessory - it can be used to mount the frame in cases where it's not possible to attach it directly to the headphones in a vertical position alongside the head. The adjustable joint comes with a plastic wrench.

Components mentioned in this manual

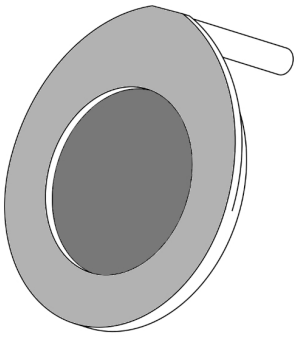


Frame with tracking points

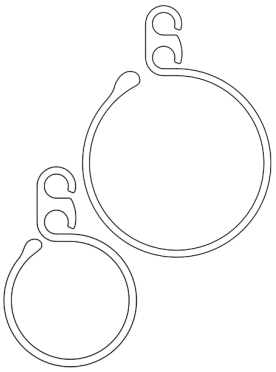


Adjustable joint

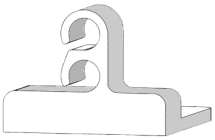
Plastic wrench



Light filter



Round filter holder
(big and small)



Flat
filter holder

Universal
filter holder

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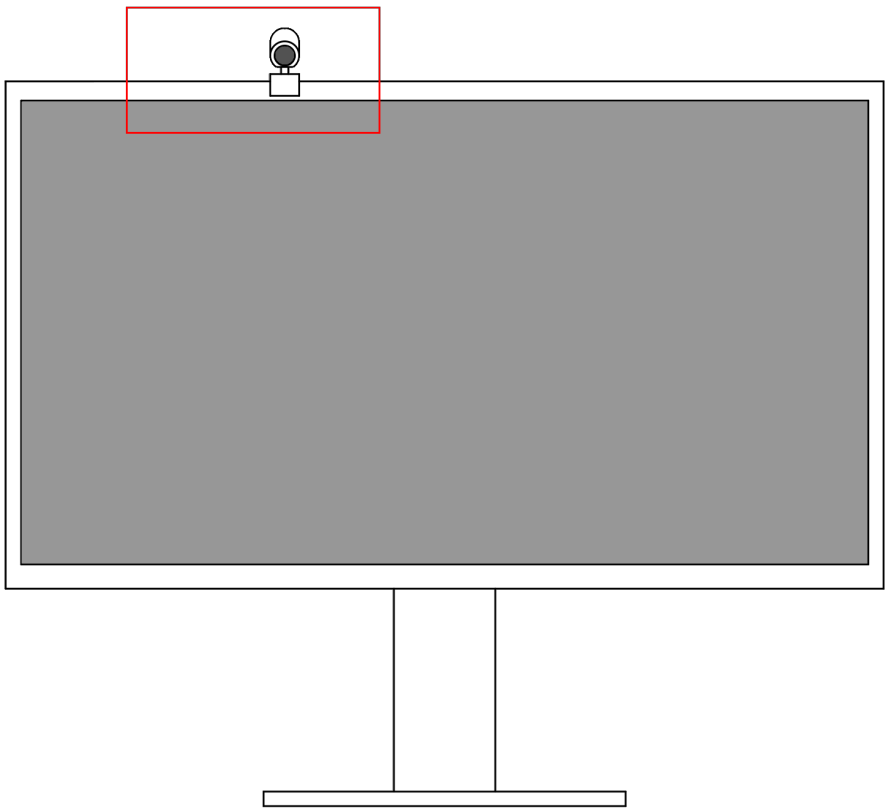
Preparation

Positioning the webcam

Before attaching the frame with tracking points to your headphones, you first need to determine where the webcam will be placed. I recommend placing the webcam on the left side of your monitor so that it faces directly toward the tracking points, which will be mounted on the left side of the headphones.

Fig. 1 - Webcam position



Attaching the frame to the headphones

Before applying the hook-and-loop fastener, allow it to reach room temperature - either by warming it up or letting it cool down. Skipping this step can negatively affect the adhesive's performance.

Try positioning the frame on your headphones first to make sure it won't interfere with headphone functionality and that the tracking points remain in a vertical orientation.
If the points cannot be positioned vertically, use the adjustable joint - see instructions on page 7.

Prepare the rough (hook) side of the hook-and-loop fastener. Before applying, trim it with scissors to fit the shape and length of the frame (see Fig. 2 on the next page, which shows the adhesive area and recommended cut lines in red dashed lines). Once trimmed, stick the fastener onto the designated area of the frame as shown in the diagram. Press firmly when applying to ensure it adheres properly and won't come off when removing the frame later.

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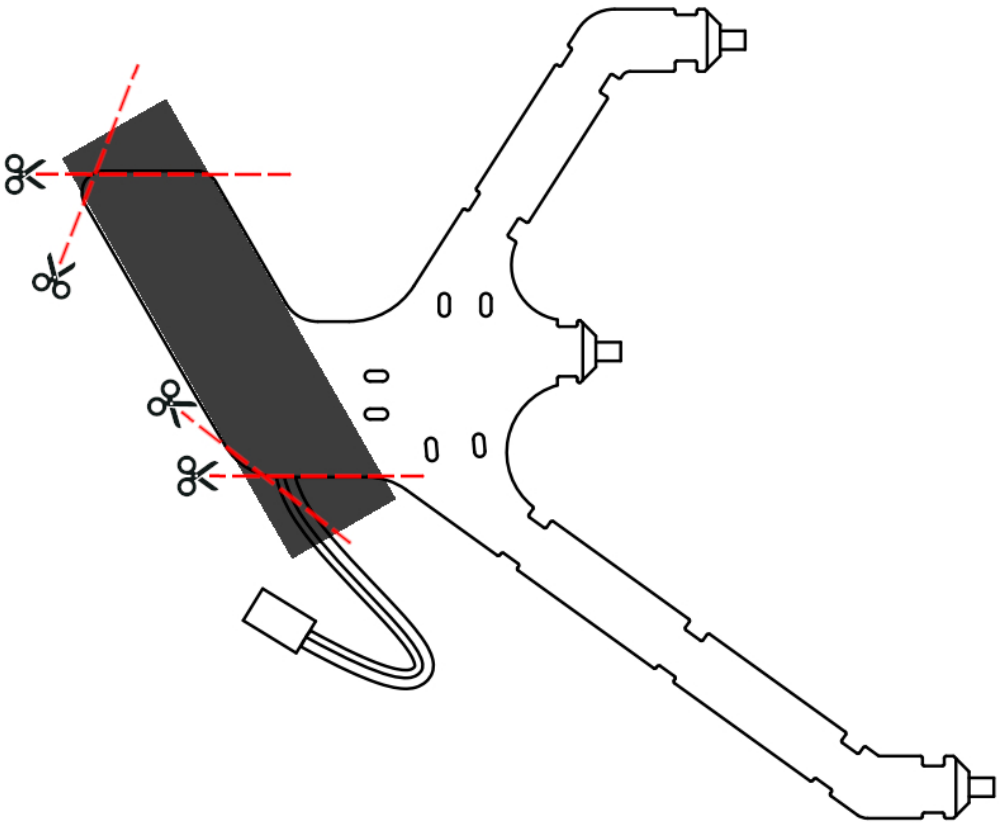
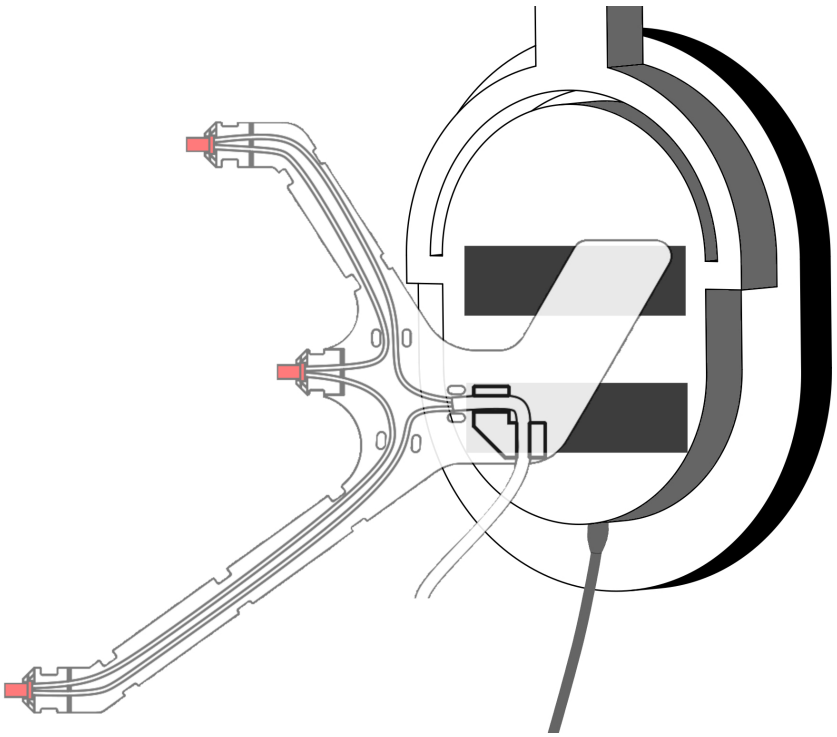
Fig. 2 - Preparing the frame



Trim the soft (loop) side of the hook-and-loop fastener to match the appropriate shape and length, and attach it to the headphones as shown in the diagram (Fig. 3). When applying, press the fastener firmly to ensure strong adhesion and to prevent it from peeling off when removing the frame. In the illustration, the fastener is cut in half and applied in two horizontal strips, one above the other.

Fig. 3 - Hook-and-loop fastener placement on headphones



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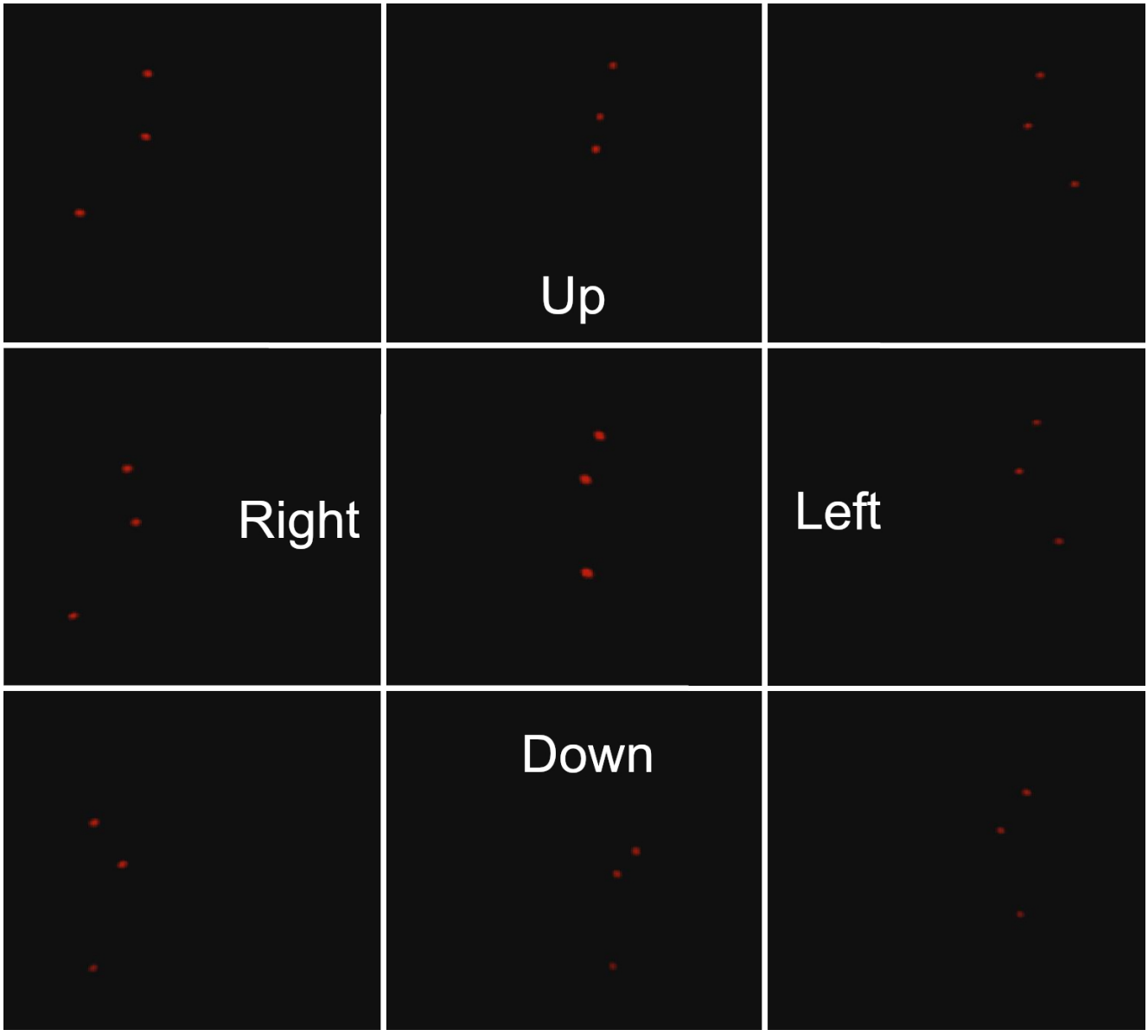
Now launch your webcam software and check what the camera sees.
At this stage, the built-in Windows application "Camera" is sufficient. If you do not have any software that can display the webcam image, install the Opentrack program as described in the instructions on page 9.

Sit down as you normally would while playing and put on your headphones. Plug the tracking points into a USB port of your PC, place the frame against the left ear cup, and observe the webcam image. Adjust the tracking points so that they shine evenly and as brightly as possible toward the webcam. Press the frame against the headphones in this position. Move your head in all directions and check whether the points overlap or disappear from the camera's view during movement - they shouldn´t. If everything looks good, remove the headphones and check whether the frame interferes with headphone functionality. Adjust the frame position if necessary.

The image below (Fig. 4) shows how the tracking points should be arranged in space.
It is essential that the points do not overlap during movement and always remain within the camera's field of view.
We will cover how to configure the webcam for a dark background in the "Webcam Settings" section on page 20.

Fig. 4 - Tracking points in space



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Adjustable joint

The adjustable joint can be attached to the headphones using the included hook-and-loop fastener or with zip ties (wrapped around the shorter surface with cutouts). Apply the hook (rough) side of the fastener to the shorter end of the joint, and the loop (soft) side to the longer end. Mount the joint to the headphone frame using the shorter surface, then use the included plastic wrench to loosen the screw, adjust the angle as needed, and tighten it again. The frame is then attached to the longer surface of the joint in the same way as it would be attached directly to the headphones.
If you haven't yet applied the hook-and-loop fastener to the frame with tracking points, please refer back to page 4.

Figure 5 shows how to trim and apply the fastener to the joint.
Figure 6 illustrates how the joint should be mounted to the headphones, along with an example photo of practical use.

Fig. 5 - How to trim and apply the fastener

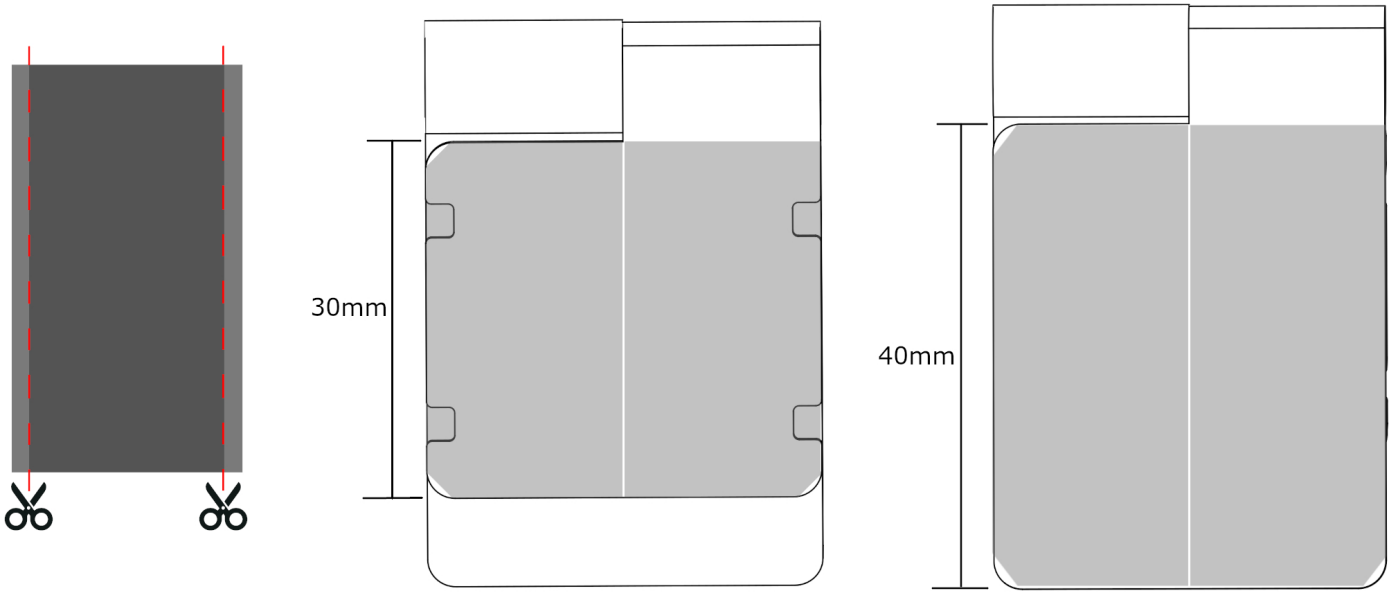
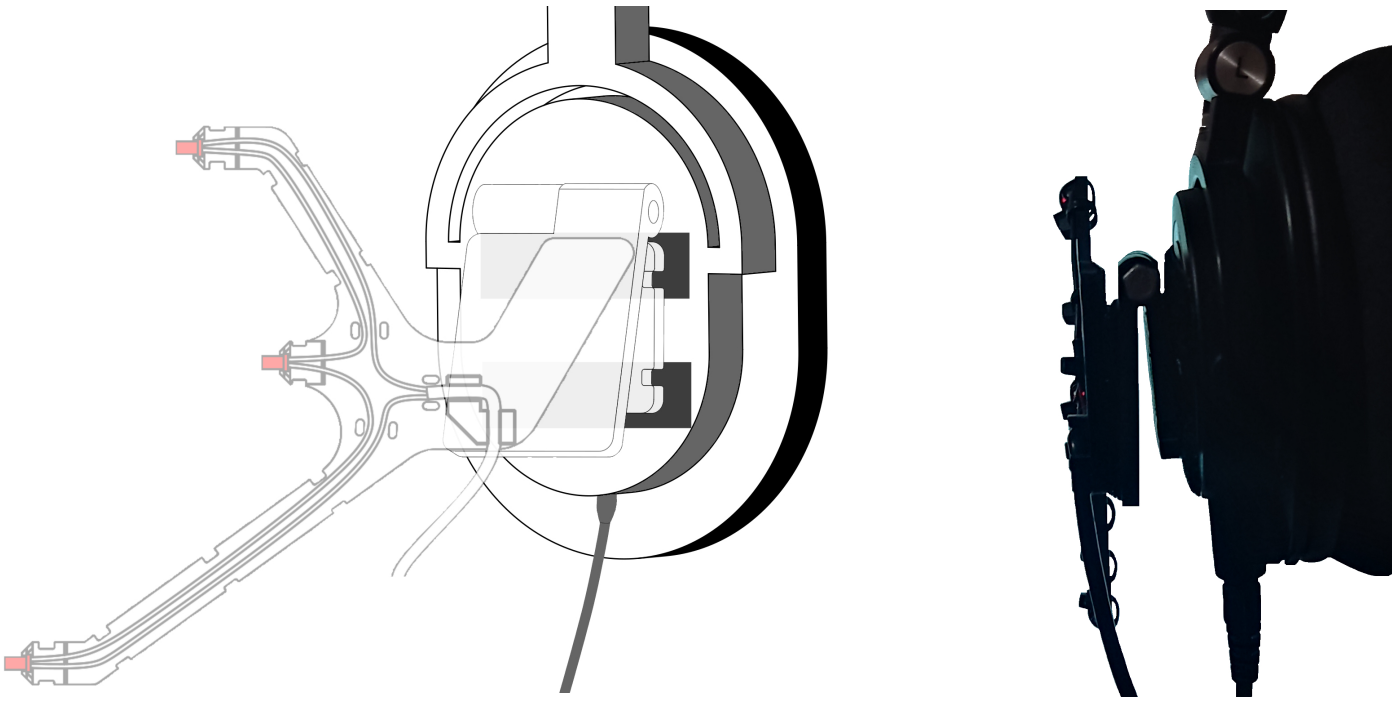


Fig. 6 - Example of practical use



Attaching the color filter to the webcam

Depending on the shape of your webcam, use either the flat filter holder or universal holder or the round holder designed for rounded webcams. Both the universal and flat filter holders are attached using the included adhesive tape. When using the universal holder, you'll need to create an opening in the tape, thread the holder through it, and then stick it to the desired place.

Each holder provides two height positions for the light filter. Insert the light filter into the holder in such a way that the webcam has a clear view of the tracking points throughout their entire range of movement - horizontally, vertically, and diagonally (see Fig. 4).

This completes the hardware setup. The next step is working with the tracking software.

Fig. 8 - Examples of filter attachment to webcam

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Opentrack

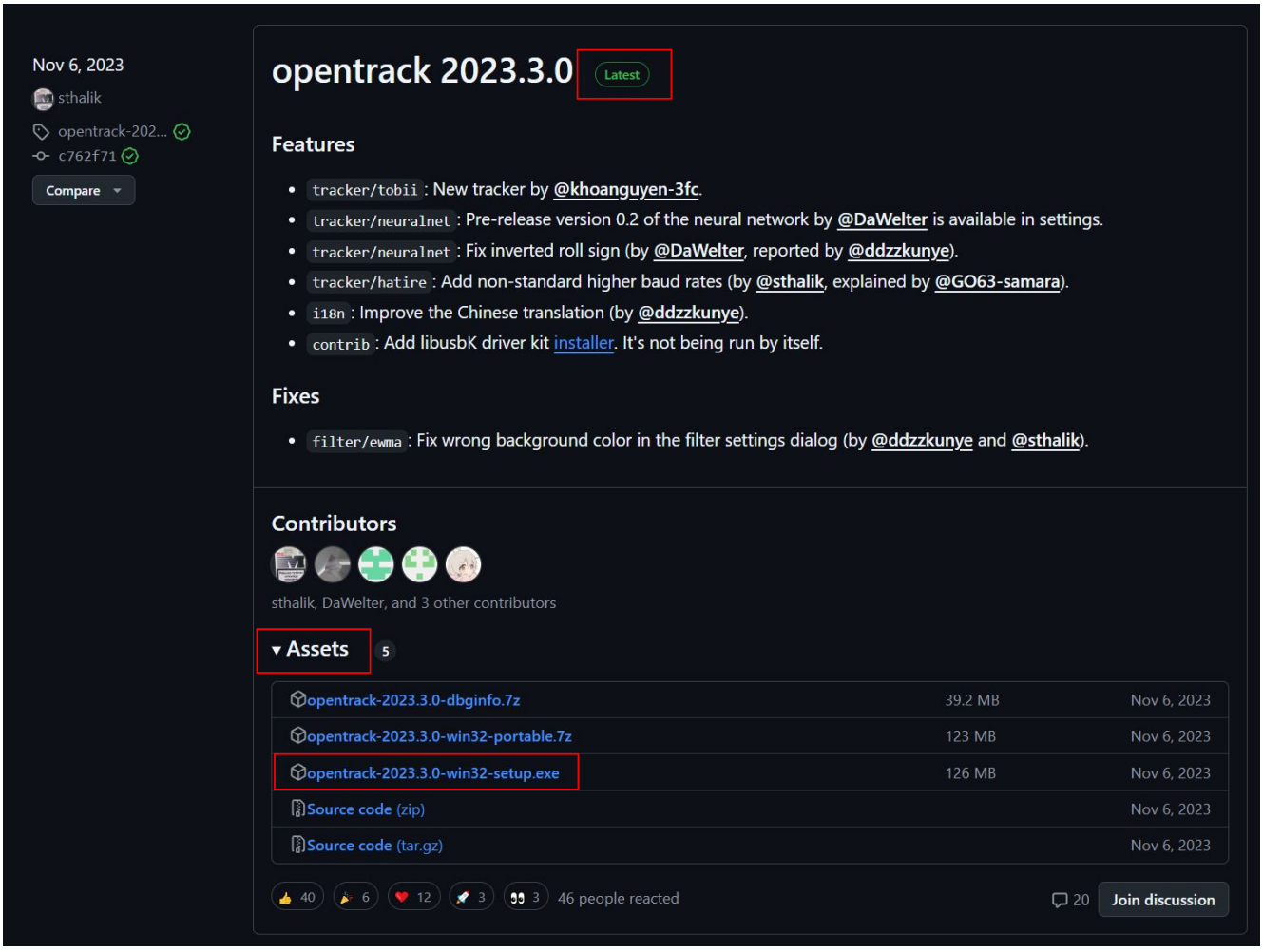
Opentrack is a program that tracks the movement of tracking points, processes the data, and sends it to the game to control camera movement. For this reason, it must be running during gameplay, and tracking must be started.

Installing Opentrack

You can download Opentrack from the following page:
https://github.com/opentrack/opentrack/releases

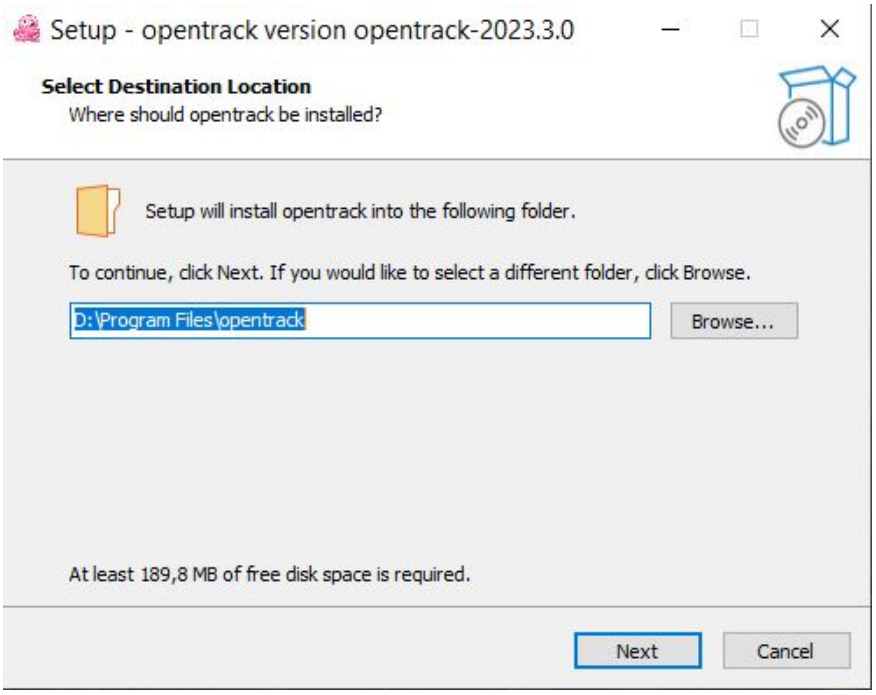
On the page, look for a section titled "**opentrack 2023.3.0**" (this was the latest version at the time this manual was written) or a newer one. It will have a green label marked "**Latest**", indicating that it is the most stable and current release.
Below the title, you'll see an arrow and the word "**Assets**". Click on it to expand the list, then click on the file named in the format: „**opentrack-[version number]-win32-setup.exe**" or „**opentrack-[version number]-win64-setup.exe**" if available (the 2023.3.0 release only offers the 32-bit version, but newer versions may include the 64-bit installer).

If you're unsure which file to download, or can´t locate the right file, you can download version 2023.3.0 directly using this link:
https://github.com/opentrack/opentrack/releases/download/opentrack-2023.3.0/opentrack-2023.3.0-win32-setup.exe
You may need to confirm the download in your browser.

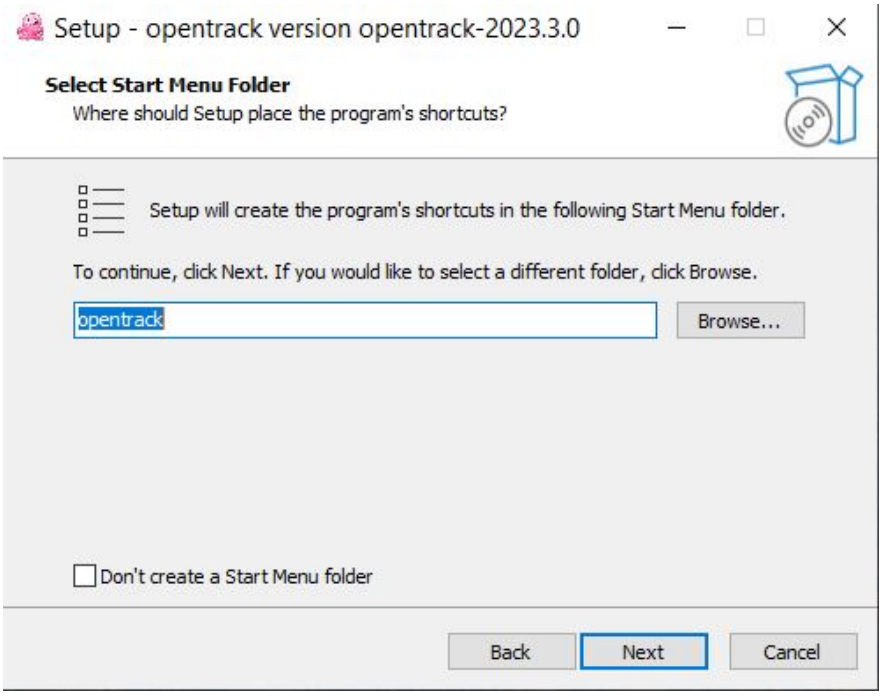


The figure shows the 2023.3.0 version window with the "Latest" tag highlighted. Below it is the Assets section, where the correct installer file is also highlighted.

Once you open the downloaded file, the installation process will begin. You can choose any drive to install the program, then proceed by clicking "**Next**".



In the next window, no changes are necessary. Continue by clicking "**Next**" again.



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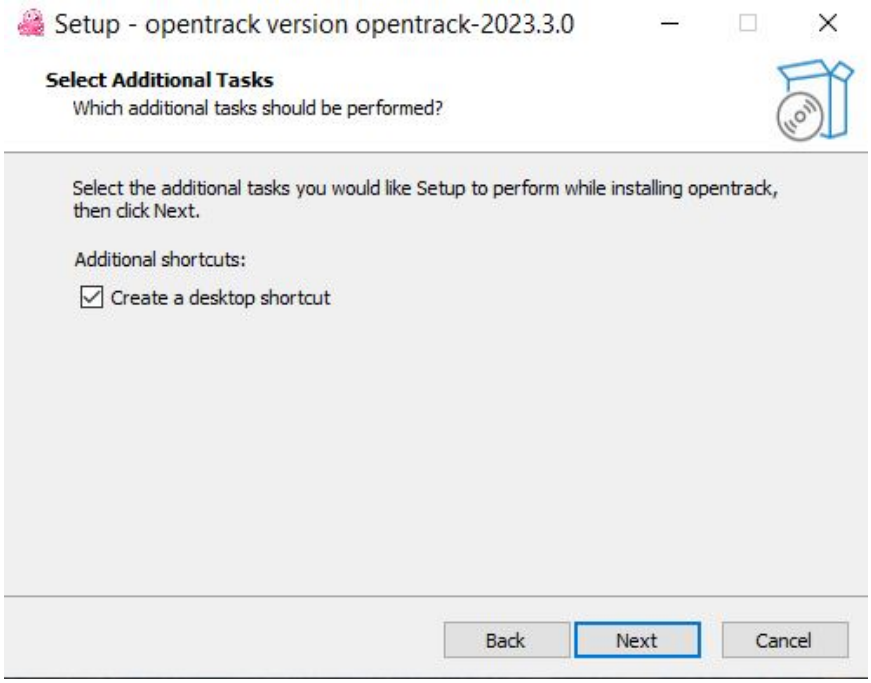
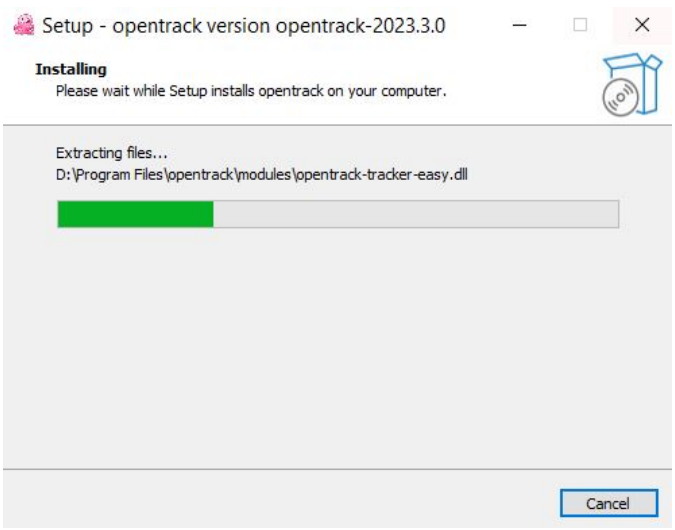
In the following window, choose whether you want to create a desktop shortcut, then click **"Next"** to continue. Since you'll need to launch the program to start headtracking, I recommend creating the shortcut.



The program will then install, and once the installation is complete, a final window will appear. Close it by clicking the **"Finish"** button. After closing the window, the program will launch automatically.



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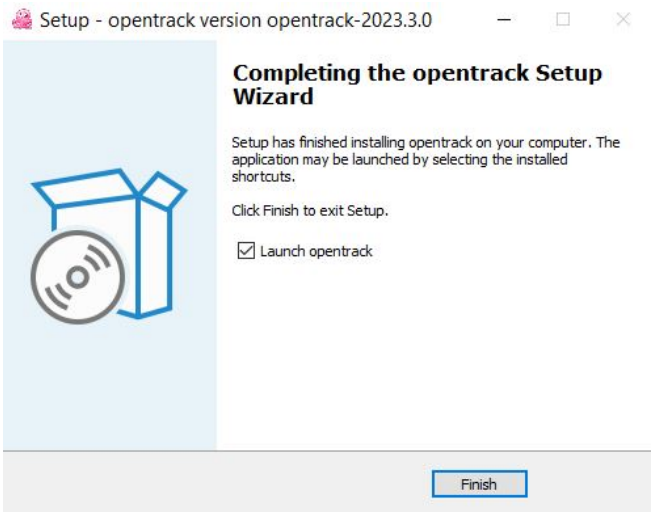


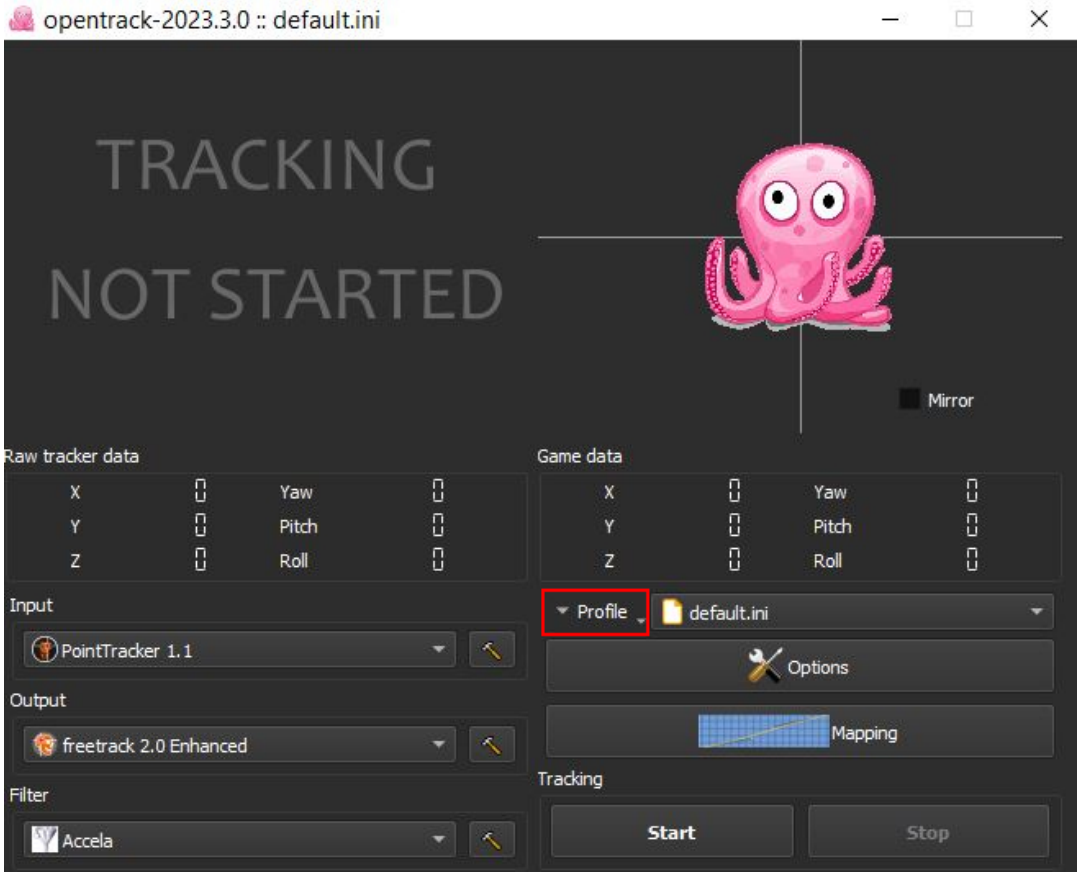
Getting started with Opentrack

For many users, the whole setup can be unnecessarily complex, so I´ll start with the most essential steps needed to get the program working. Later on, I´ll go into more detail for those who want a deeper understanding. The first steps are the same for everyone.

Below, you can see the main window of the program. The first thing you'll need to do is create a configuration file - a profile - that stores your settings.

- Click on the highlighted **"Profile"** label, then select **"Create new copied config"**.
  Enter a name for your profile in the field provided and click **"OK."**

From this point forward, all changes will be saved to this profile, which you should back up after setup in case you need to reinstall the program or make adjustments and break it.
The active profile is shown to the right of the highlighted button — in the example image, it is **"default.ini."**
You can switch between profiles by clicking the active profile name and selecting another from the list.



Next, make sure the following protocols are selected in the lower-left quarter of the window, as shown in the image:
Input - **PointTracker 1.1**
Output - **freetrack 2.0 Enhanced**
Filter - **Accela**

Once setup is complete, you can start tracking by clicking the **"Start"** button in the bottom-right corner. To stop tracking, click **"Stop"**, or use keyboard shortcuts you define.

Backing Up and Restoring Your Profile

To back up your profile, follow these steps:

1. Open the Opentrack program.
2. Click on the **"Profile"** label and select **"Open configuration directory."**
3. A folder will open containing all saved profiles.
4. Locate the profile you want to back up, right-click on it, and choose **"Copy."**
5. Navigate to the folder or location where you want to save the backup, and paste the file there.

Ideally, save your backup to:

- Storage medium that is independent of your computer (e.g., external drive or cloud storage).
- Use a different physical drive than the one where the original files and operating system are stored.
- Preferably use an SSD drive.

Back up your profile after you've finished configuring and testing the program, and after every major change to the settings.

To restore your profile from a backup, follow these steps:

1. Open the Opentrack program.
2. Click on the **"Profile"** label and select **"Open configuration directory."**
3. A folder will open — this is where Opentrack loads all profiles from.
4. Paste your backed-up profile file into this folder.
   (The exact method will depend on where you saved your backup.)

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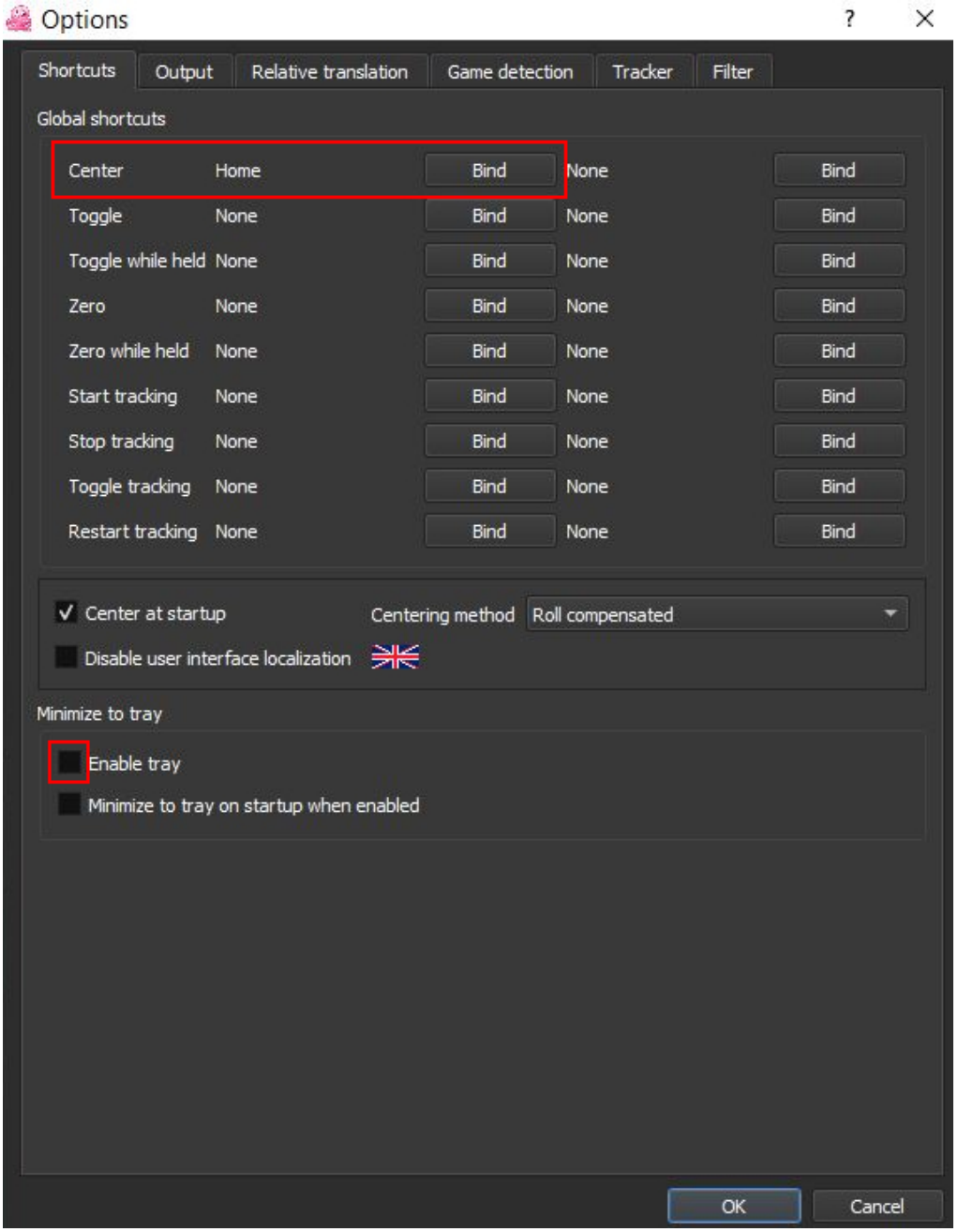
Simplified setup of Opentrack

Click the **"Options"** button on the right side of the main window, below the profile name.
A new window will open with six tabs: **Shortcuts**, **Output**, **Relative translation**, **Game detection**, **Tracker**, and **Filter**.

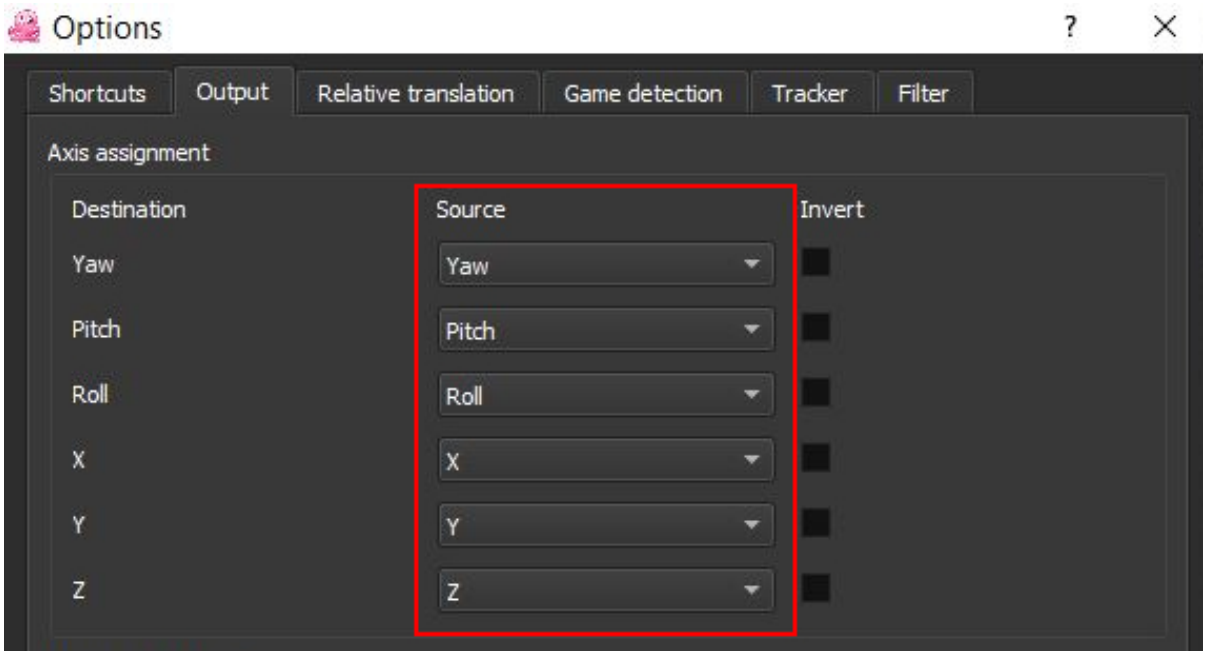
In the first tab (**Shortcuts**), disable the **"Enable tray"** option (an empty checkbox means it's disabled), and set a key for recentering the view:

- At the top left, you'll see **"Center"**, and to the right of it, a **"Bind"** button.
- Clicking this button opens a smaller window - here you can bind a key to it, or by closing the window using "X" you unbind it.
- Now press the key you want to use to center the tracking in-game.
  (I use the **Home** key for this, as shown in the example image.)



In the next tab (**Output**), you define how your movement is translated into in-game motion.
It's important to verify that the settings in the upper half of the window are correctly configured:
Yaw = Yaw
Pitch = Pitch
Roll = Roll
X = X
Y = Y
Z = Z

Depending on your preferences, you can disable individual axes by selecting **"Disabled"**, or reverse their direction by checking the **"Invert"** box.



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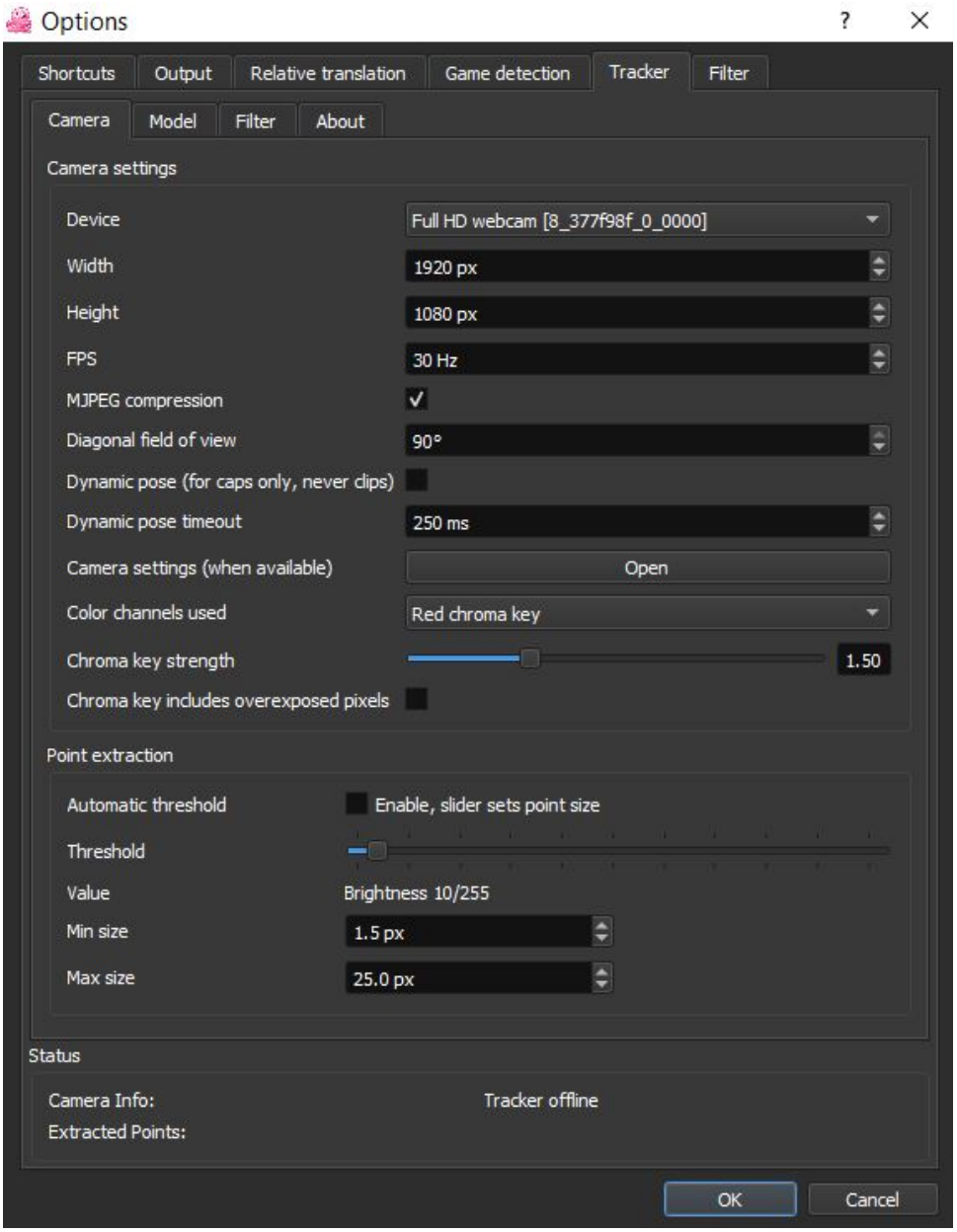
The **Tracker** tab is one of the most important and includes four sub-tabs: **Camera, Model, Filter**, and **About**. Here, you'll configure your webcam, tell the program what to track, which filters to apply, and how to smooth out movement.



In the **Camera** sub-tab (from top to bottom):
Camera settings - settings related to the webcam
Device - select your webcam here, if it's not already selected.
Width - enter your webcam's resolution width in pixels (e.g., Full HD = 1920 px).
Height - enter the resolution height in pixels (e.g., Full HD = 1080 px).
FPS, MJPEG compression, Diagonal field of view, Dynamic pose, and **Dynamic pose timeout** - set these according to the example image provided in the guide.

Camera settings - the **"Open"** button will launch advanced webcam settings. Instructions for adjusting the camera are found on page 20.
*Sometimes Opentrack or system may change the webcam settings (you'll notice this if the image appears different than usual when tracking starts). To fix this, open the webcam settings, check and adjust it and click **"Apply"**. This resolves the issue.*

Color channels used - tells the program which color to track in the image. Select "**Red chroma**".

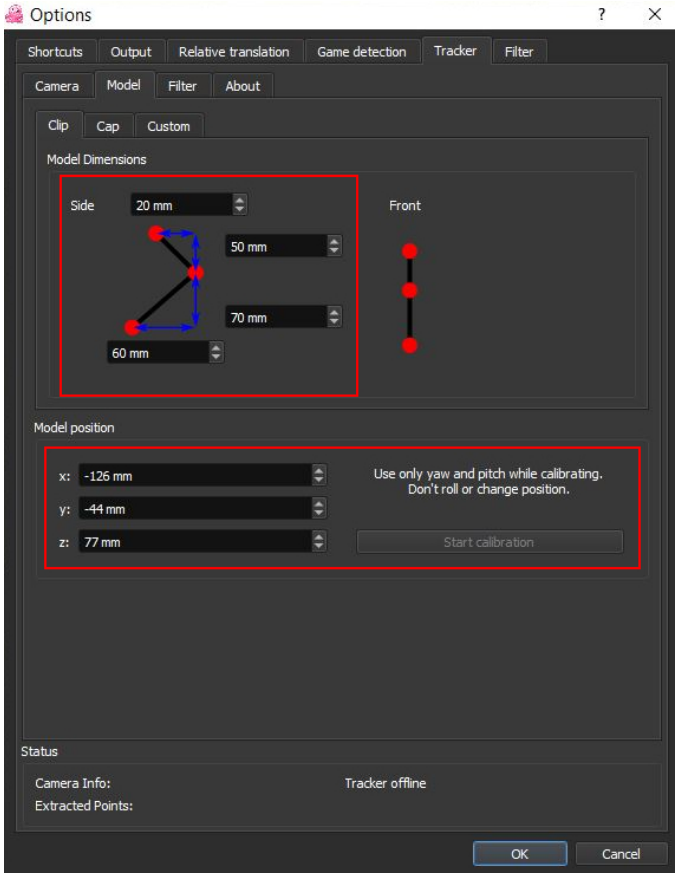
The following settings are individual and depend on your environment. You need to configure them so that the tracking points are the only objects being tracked. While adjusting these values, also test how artificial lighting in your room affects the stability of tracking.

Chroma key strength - Adjusts how saturated the red color must be in order to be detected.
Chroma key includes overexposed pixels - If enabled, the program will also detect overexposed (very bright) pixels.

Point extraction section
Automatic threshold - Switches the detection mode between point size and brightness; currently controls brightness.
Threshold - How bright a point must be to be detected (the higher the value, the brighter it must be).
Value - Displays the chosen threshold value from a bar above it.
Min. size - The smallest detected light source, in pixels (smaller points will be ignored).
Max. size - The largest detected light source, in pixels (larger points will be ignored).

Status section shows the current tracking state:
Camera Info - Tracker Offline / Online – Indicates whether tracking is off or on.
Extracted Points - Shows the number of points currently being tracked. The goal is to consistently see three stable points.

The **Model** sub-tab defines the shape and size of the frame with tracking points. It includes three sub-sections: **Clip, Cap**, and **Custom**.
Only the **Clip** tab is relevant here - this is where you set the dimensions of the frame. From top to bottom, enter the following values: **20, 50, 70, 60**.
The three numeric fields under **Model position** depend entirely on your setup - the shape of your headphones and the placement of the frame. These values are automatically configured during calibration, which you can perform once the program is actively tracking and can consistently detect all three points.
To start calibration, click the **"Start calibration"** button on the right, then slowly move your head from the center to the top, bottom, left, and right. When finished, click **"Stop calibration."**

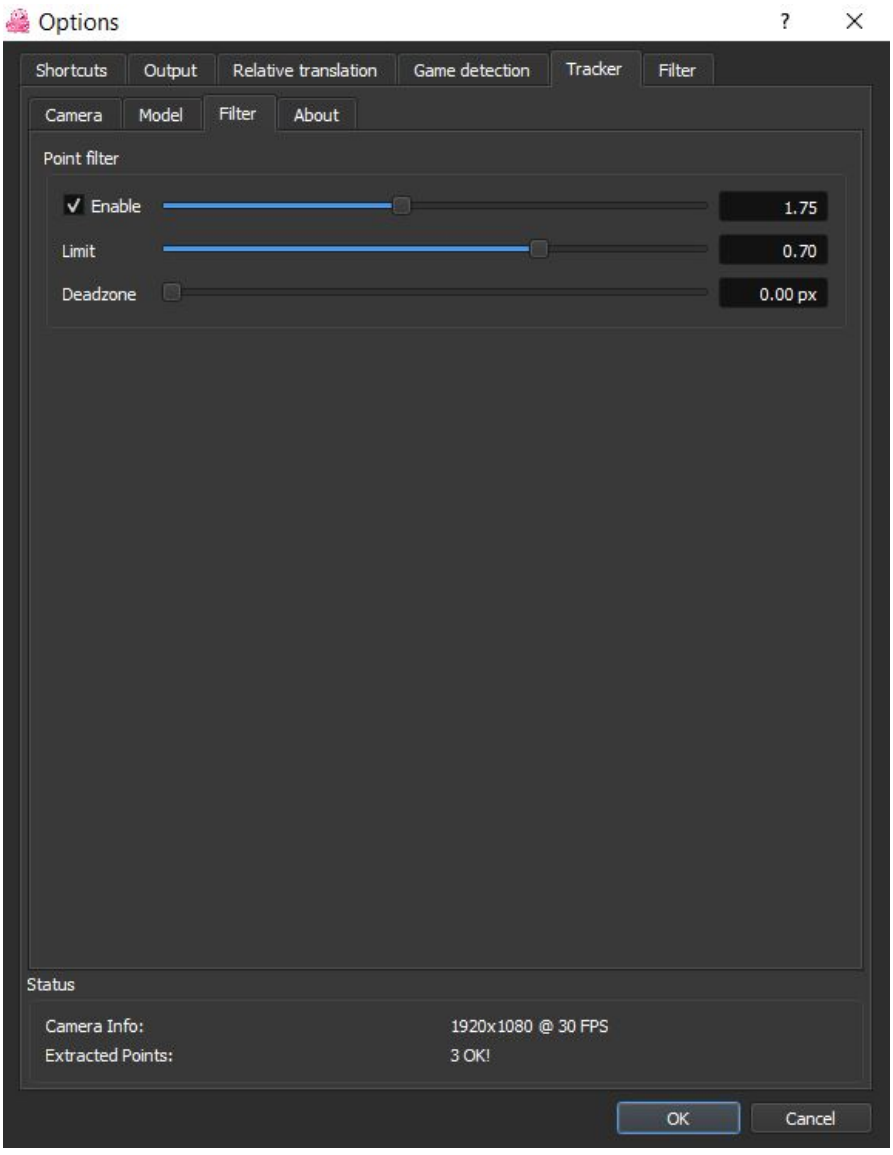


In the **Filter** sub-tab, you can adjust how the program filters the position of the tracking points. This setting is crucial, because the light from the tracking points appears at slightly different position in each frame, and the program may interpret these small shifts as "jitter," which would be transferred into the game. This filter averages the position of the point center based on the values set by the sliders. A filter that is too weak may reduce, but not eliminate jitter and a filter that is too strong will introduce noticeable delay between your physical movement and the resulting movement in the game.

How to set up a filter:

- Enable the filter by checking the dark box on the left.
- First slider controls the overall strength of the filter. Higher values increase the delay in camera movement.
- Second slider (Limit) sets how strict the filter should be. Higher values mean less strict filtering. Lower values increase delay.
- Third slider (Deadzone) defines an area around the current position that the filter will ignore. In my experience, even the smallest value here causes noticeable stuttering in camera movement, which disrupts the gameplay experience.

This filter should be balanced in combination with another filter, which will be explained on the next page. By tuning both together, you can achieve smooth camera movement with minimal input lag. If you plan to adjust the filters, I recommend launching the game in which you'll be using headtracking, start tracking in Opentrack, and observing how the camera behaves in-game. Modify only one slider at a time, and confirm each change by clicking **"OK."**



In the final **Filter** tab, you can fine-tune how the program smooths out the detected motion.

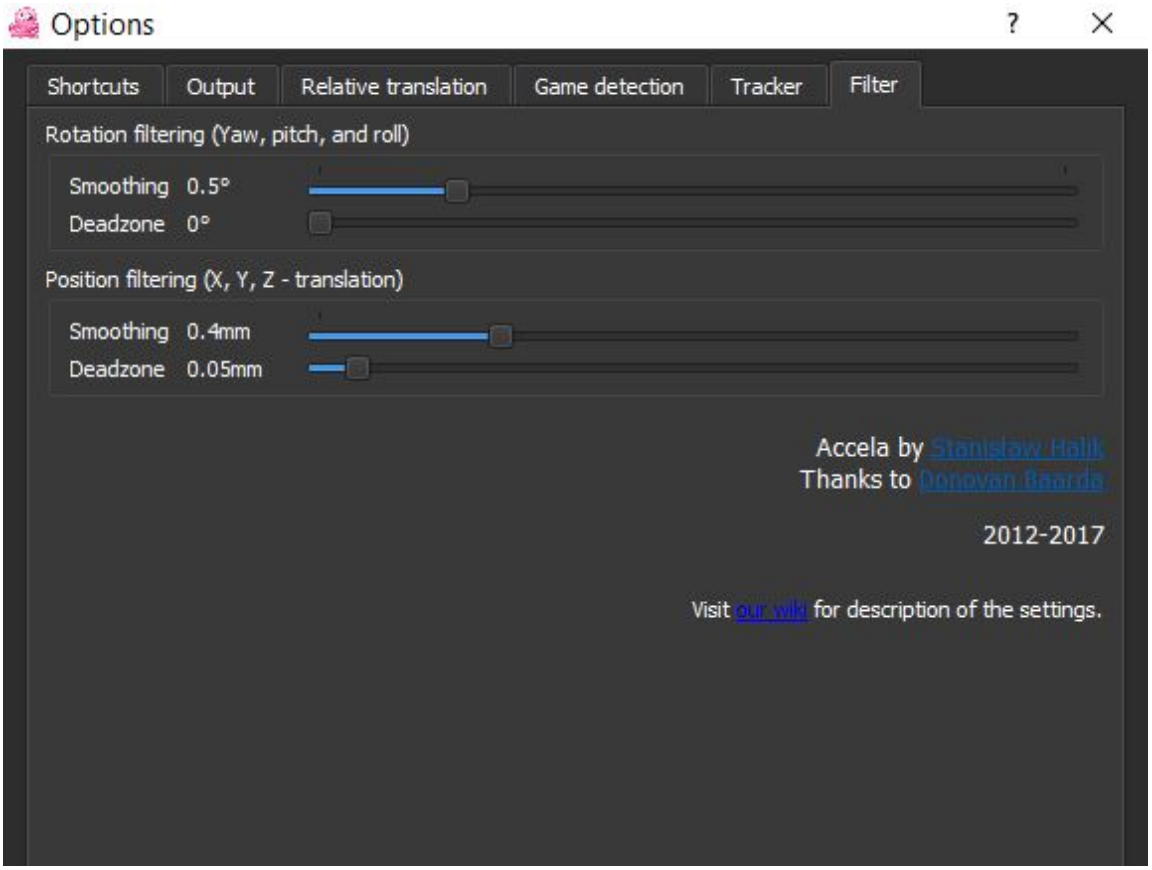
Rotation filtering (Yaw, Pitch, and Roll) split into:

- **Smoothing** - Controls how much the rotation axes are smoothed.
  If the value is too high, there will be a noticeable delay between your head movement and the movement in-game. If too low, the image may appear jittery or shaky.
- **Deadzone** - Defines the size of the deadzone for rotational axes - an area around the center where small movements are ignored. For natural camera movement, I recommend setting this value to 0.

Position filtering (X, Y, Z - translation) split into:

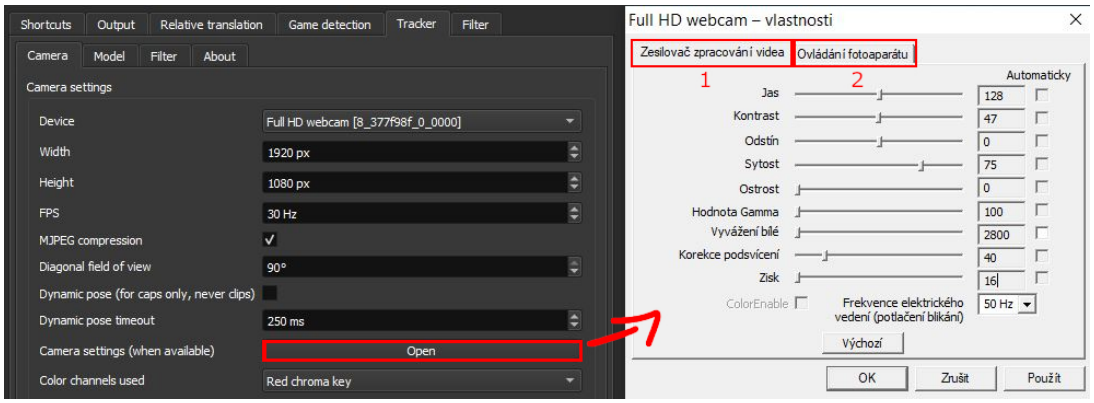
- **Smoothing** - Smooths the positional axes. Again, too high a value will cause noticeable lag in response.
- **Deadzone** - Defines a deadzone for positional movement - a range where movement is ignored and not transferred to the camera in-game.

You can judge the quality of these settings by how the camera behaves in-game. If the camera movement noticeably lags behind your head, reduce the smoothing value on the affected axis. You've found the optimal settings when the camera moves nearly as fast and precisely as your head, without jittering or drifting when focusing on a fixed point.

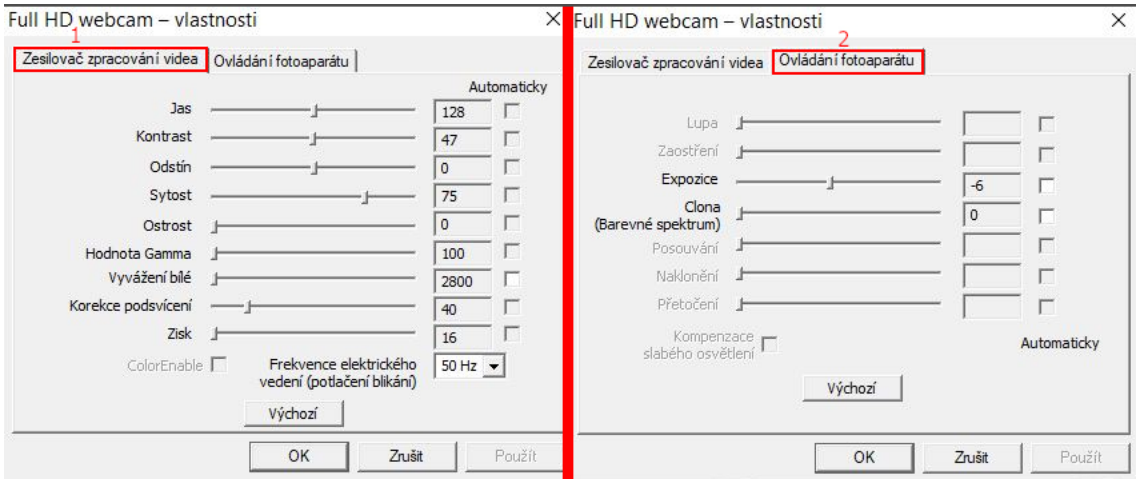


Camera settings

Click the **“Open”** button to access an additional window with advanced webcam settings, as shown in the image below. The settings window contains two tabs: **“Video Processing Amplifier”** and **“Camera Control”** marked as „1“ and „2“ in the image.



In the image below, both tabs are displayed side by side. First, **write down or take a photo of the default webcam values**, then adjust them according to the image and click **“OK”**.



This configuration has been tested extensively during gaming and provides a reliable starting point. Each user may further adjust the settings based on their environment and needs. The goal is to achieve an image that is as dark as possible, while still keeping the tracking points clearly visible in all directions of head movement.

When adjusting the settings, it’s recommended to enable tracking and observe how the image changes. However, note that the preview is not final – to see the actual effect of any change, you must stop and restart tracking.

Tips for tuning the values:

- No setting should be in automatic mode (the checkbox next to each value must be empty).
- A low value for backlight compensation may cause the image to flicker (even if auto mode is off).
- Exposure (on tab 2) has the most significant impact on image darkness.

After completing the webcam setup, I recommend saving the settings by taking a photo, writing them down, or otherwise backing them up. This allows for quick restoration if the system resets the values or if you want to switch between gaming and normal webcam use. Personally, I keep an image file with both the default and gaming values, placed next to the Opentrack shortcut on my desktop.

Switching back to defaul settings

To use the webcam for normal purposes, open the same settings window and click the **“Default”** button at the bottom center of both tabs. This should restore the original values. Then, simply rotate the light filter out of the webcam’s field of view – and you’re done. Ocassionaly, clicking “Default” may reset the settings incorrectly, which is why I highly recommend saving your default values as well as . I store them both in a picture next to Opentrack icon on desktop.

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Curve settings

Curves define how the camera responds to the movement of the tracking points during different head motions.

To adjust the curves, click the **“Mapping”** button located under the **“Options”** button in the main Opentrack window. This opens a new window with six tabs:

Yaw = head turning left and right (as if saying “No”)
Pitch = head tilting up and down (as if saying “Yes”)
Roll = tilting the head toward the shoulders
X = lateral leaning (side-to-side movement)
Y = forward and backward leaning
Z = vertical movement (crouching or stretching)

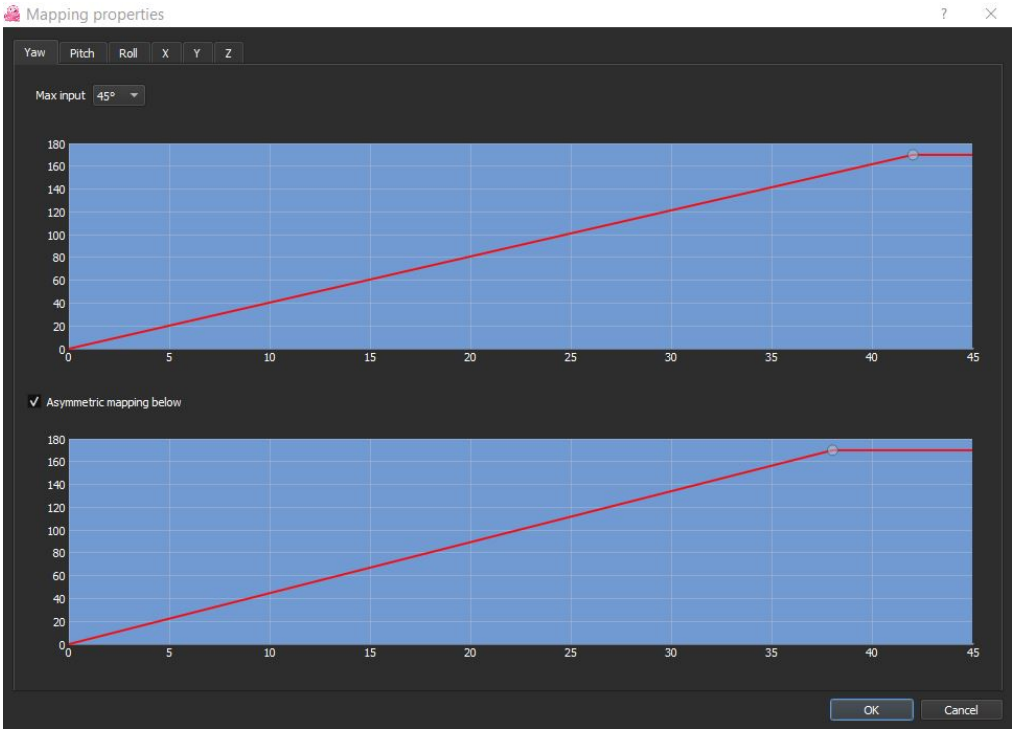
An example of this window is shown below. Each tab contains a graph that you can customize according to your preferences. The **horizontal axis** represents how much the tracking points move, and the **vertical axis** represents how much the camera moves in the game. You can adjust the range of the graph by changing the value next to “**Max input**” by clicking on it.

If you want different sensitivities for left/right or up/down motion, you can enable asymmetric mapping by clicking on “**Asymmetric mapping below**” below the graph. In that case, the curve will split into two separate sides with independent sensitivity. In this manual, asymmetric mapping is demonstrated for the **Yaw**, **Pitch**, and **Z** axes.

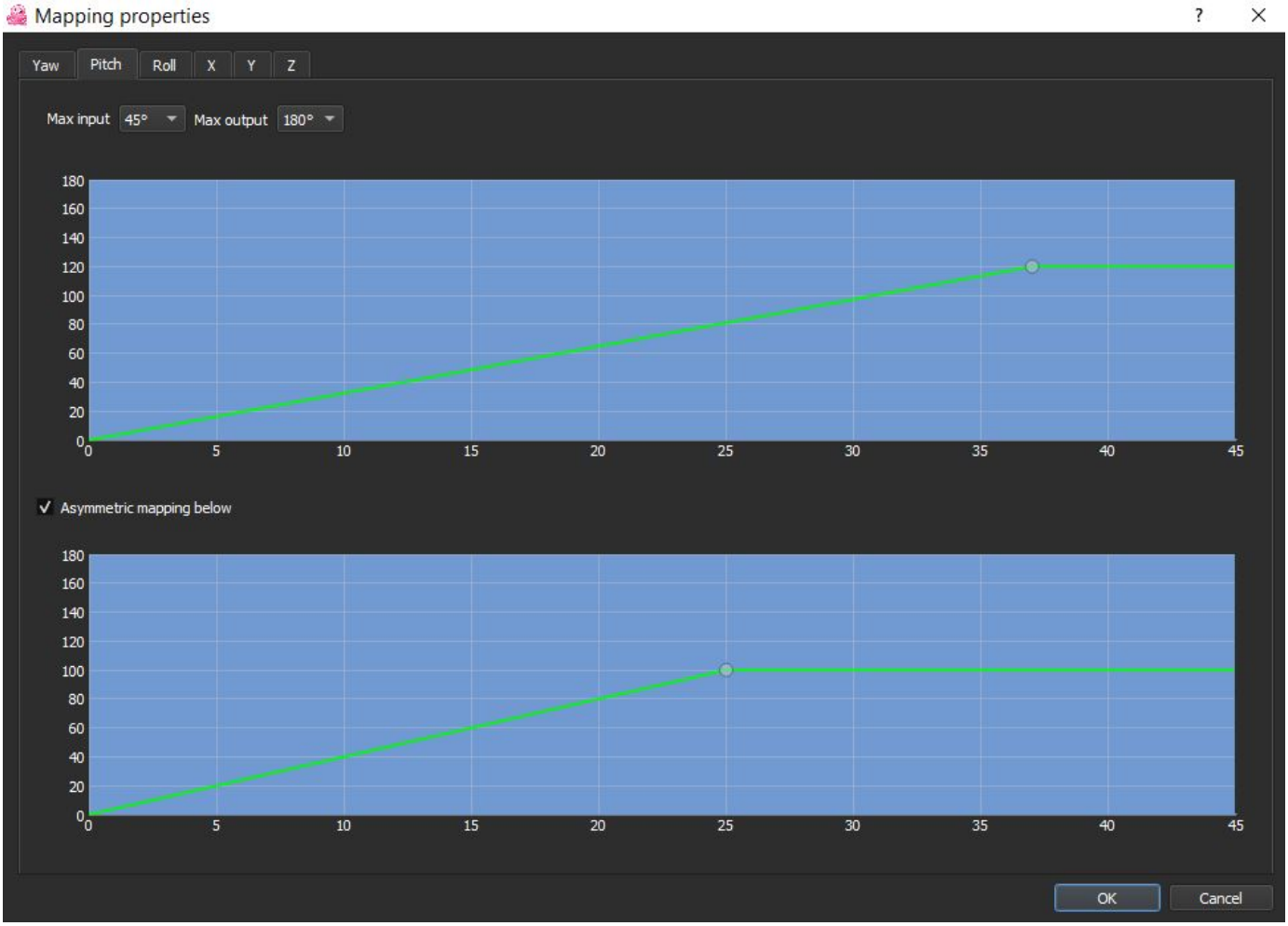
To adjust the curve, click on the colored line with the left mouse button to add a new control point, move a point by dragging it with the left mouse button or delete a point by right-clicking on it.

In the image below, the curve is linear and shows that the in-game camera rotates 170° when I turn my head 42° to the right and 38° to the left. I have split the axis because I find it harder to look at the monitor when I´m turning left.

The curves in this manual are well-suited for flight simulators. For racing or other types of simulators, you’ll likely need to adjust the curves accordingly. You can copy the displayed curves or tweak them based on your personal preference. To fine-tune the behavior, I recommend enabling tracking, launching your desired game and testing the adjustments in real time. For more precise motion control, use longer curves. Curves are saved within your active profile, so you can create different profiles for different games.



This is **Pitch** axis. In this case, the upper curve controls upward view, and the lower curve controls downward view. This setup reflects the natural limitation that people generally have less range when looking downward than upward. For that reason, the lower curve is more sensitive but ends at 100°. The upper curve is designed to make looking upward slightly more demanding, simulating the awkwardness of tilting your head fully back. Additionally, it's not natural to see behind yourself just by looking up, so the upper curve is limited to a maximum of 120°.



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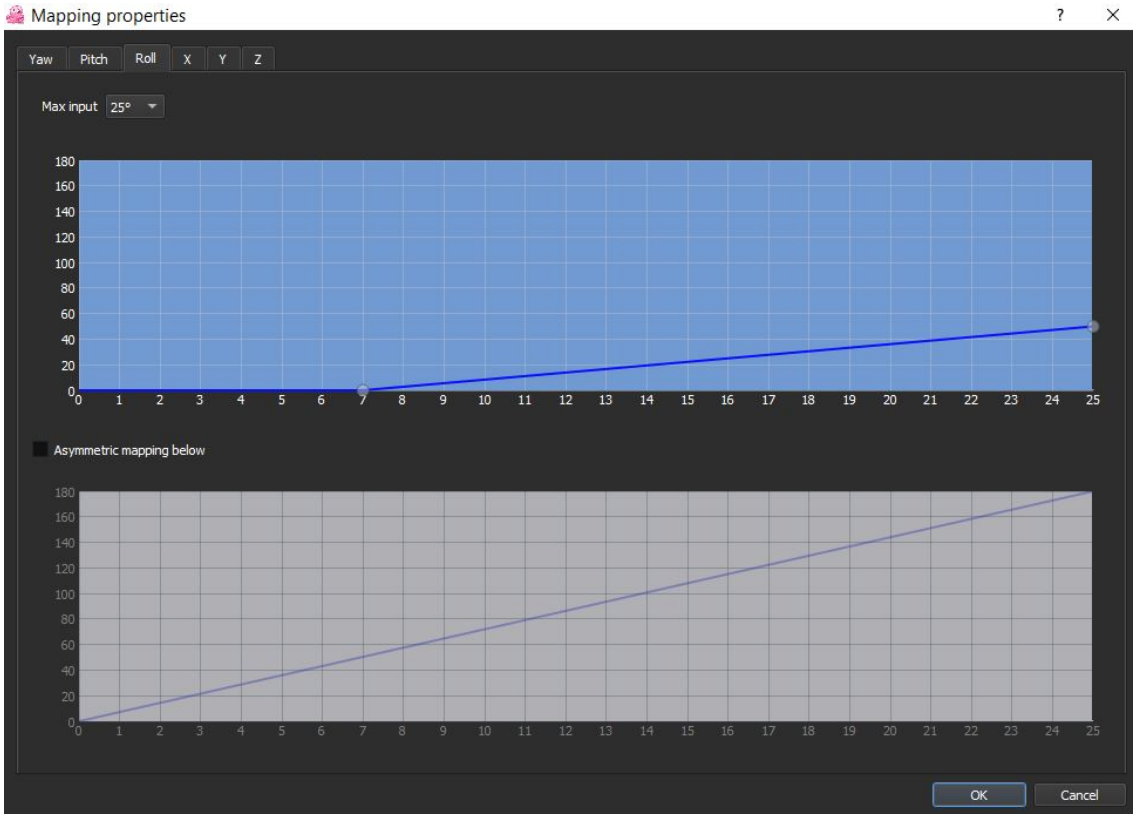
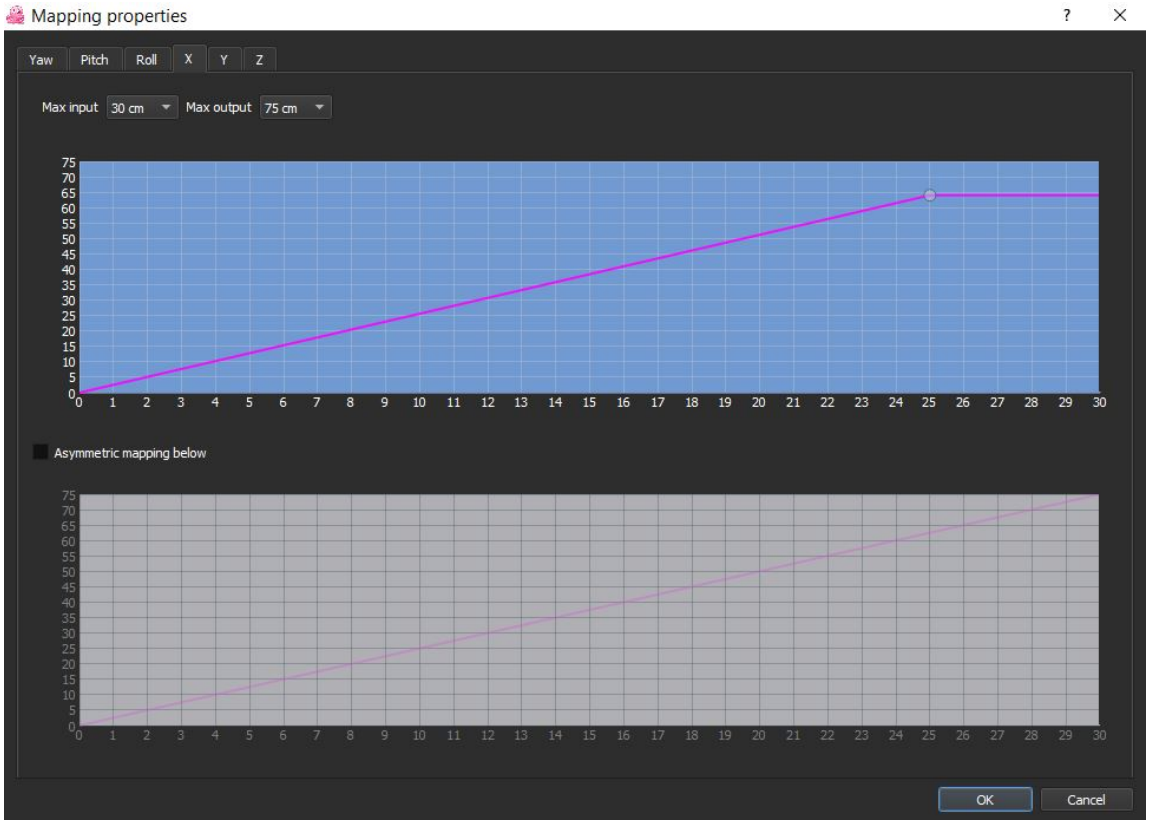
Below is **Roll** axis. I created a deadzone on it to reduce excessive sensitivity when looking around the cockpit. This still allows for natural head tilting during maneuvers, but prevents the camera from rotating when searching for switches in the cockpit.



The **X**, **Y**, and **Z** axes are measured in centimeters.
The **X** axis is useful when leaning sideways to look behind the pilot's seat, for example when checking your six.



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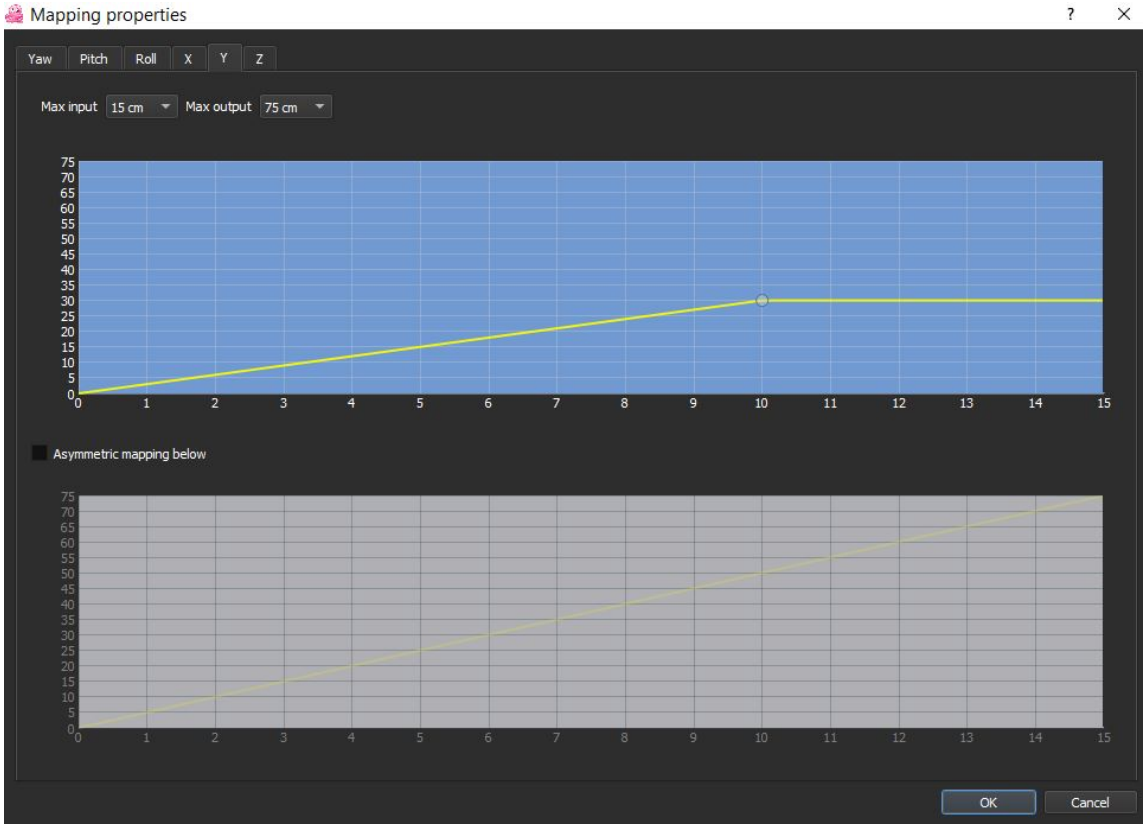
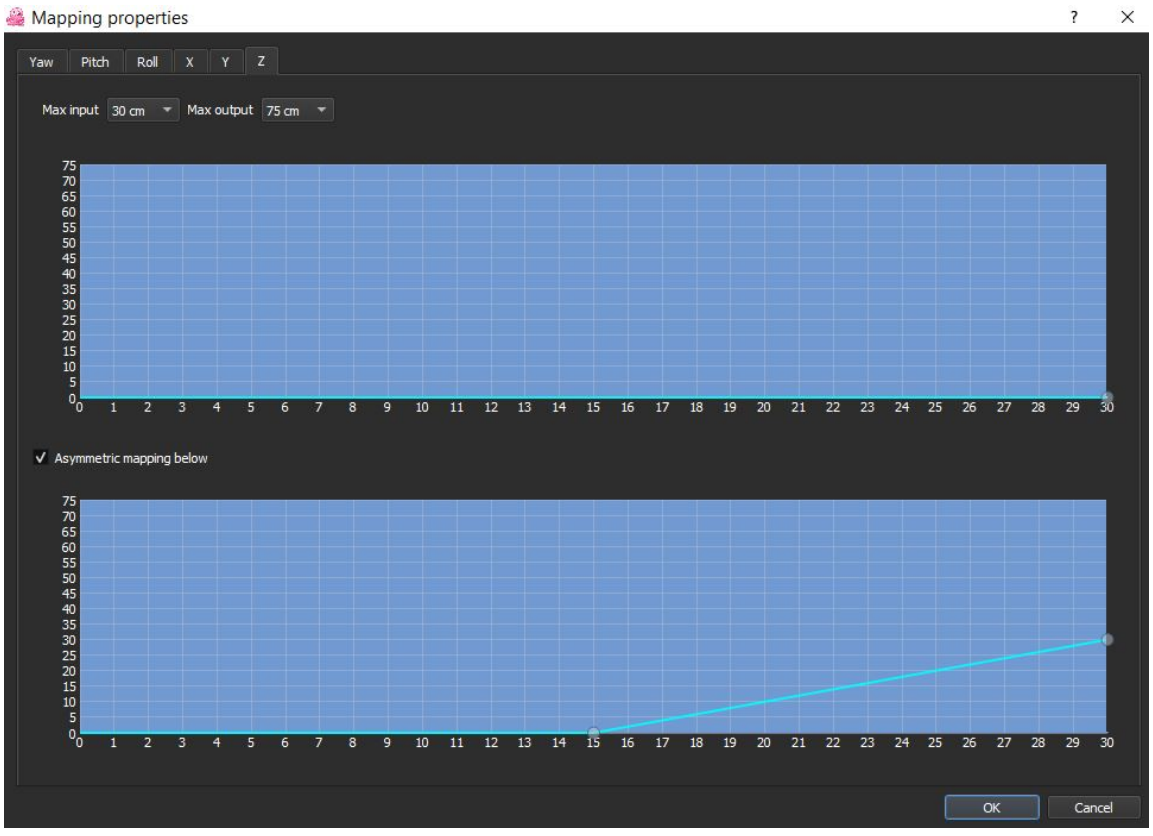
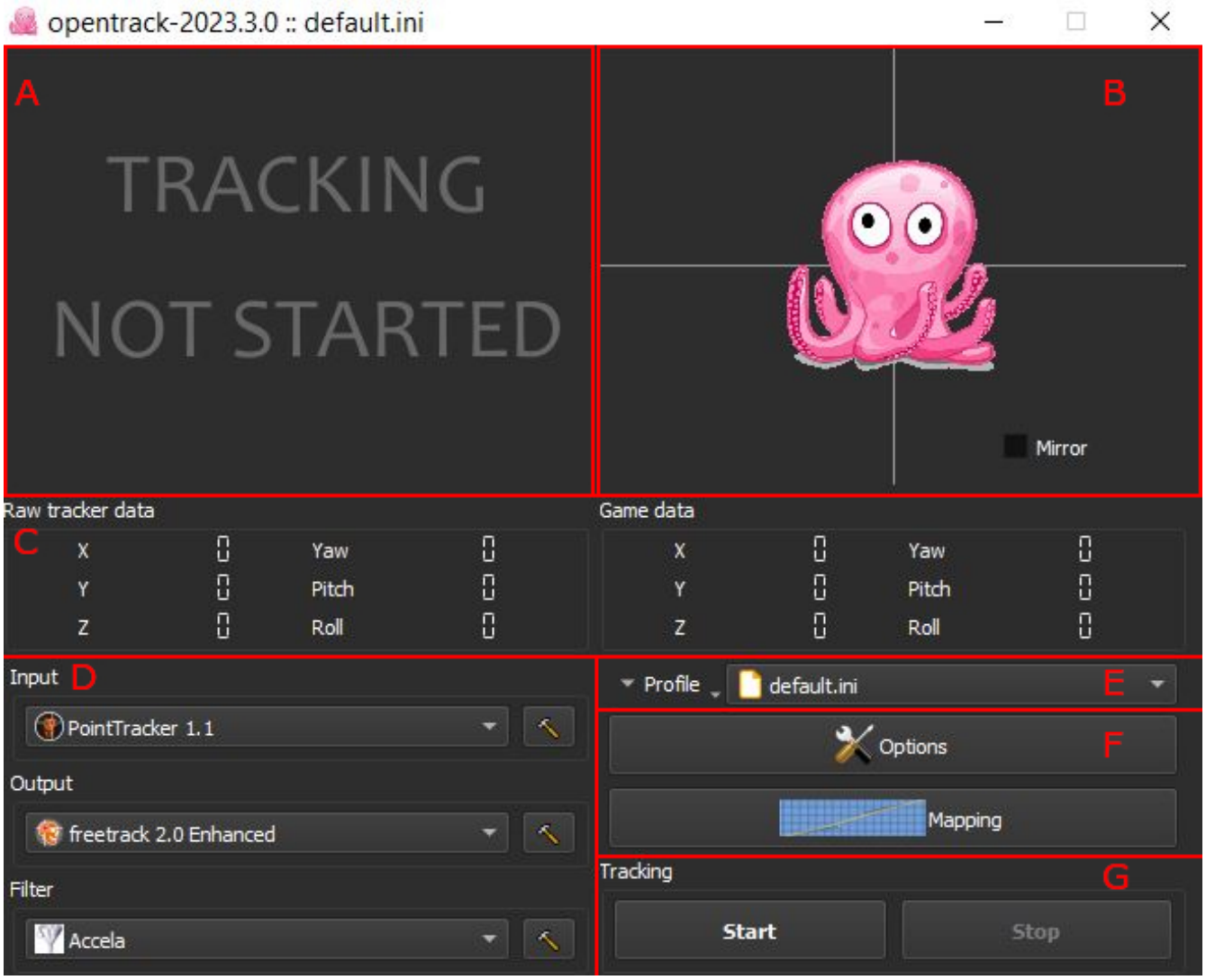
The last two axes (**Y** and **Z**) are useful when looking for switches and buttons located outside the pilot's normal reach, or when trying to see instruments that are partially obstructed by other elements in the cockpit. These axes are indirectly linked - when you crouch, you naturally move your head slightly forward, and when you lean forward, you move slightly up or down as well. That's why I've created a deadzone on the Z axis - I don't want the image to shift forward every time I crouch. If I truly want to move forward, I have to do it intentionally.
Some might think the **Y** axis is used to zoom in, but simulators typically use a separate "Zoom" axis for that. You can usually assign it to an unused axis on your joystick or throttle.





Detailed description of the Opentrack

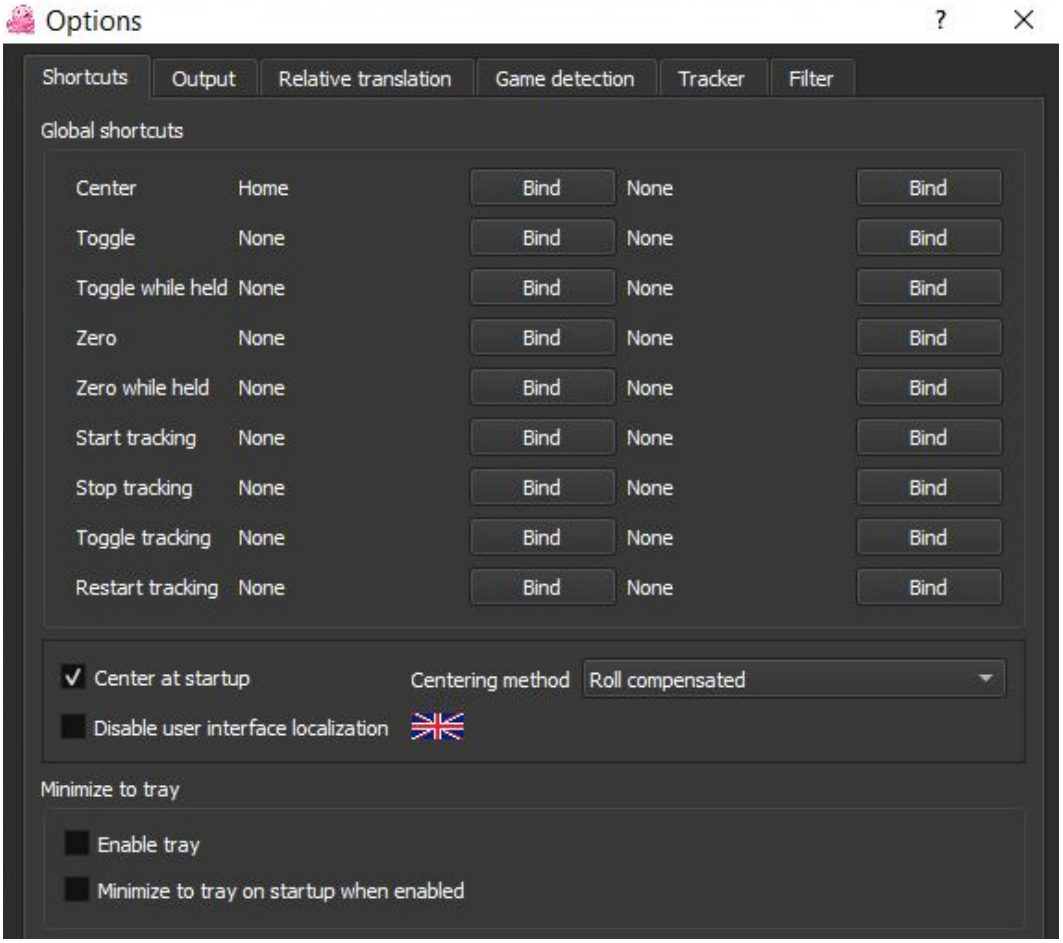


I have divided the main window of the program into seven sections labeled **A**-**G**.
A - This window displays the webcam preview.
B - When tracking is enabled, the program icon shows how the program interprets the movement of the tracking points. The preview does not show small image jitter, which you will notice only in the game. The icon serves only as a rough indicator.
C - This area displays the position values of each axis during tracking. On the left are raw data (actual movement of the points in space), on the right are filtered data (as sent to the game, based on your curve settings).
D - This section is where you configure how the program collects data (**Input**), filters it (**Filter**) and sends it to the game (**Output**).*
E - Here you can select your active profile. Click the arrow on the left to create a new profile or open the folder with all saved profiles.
F - Use this section to open the program settings or the curve editor.
G - Here you start or stop tracking.

* The settings windows may vary depending on the selected protocol. To access the specific **protocol settings**, click the **wrench icon** to the right of the dropdown menu. In this case, the **Input** and **Filter** settings are also accessible through the “Options” button, and I described them in the simplified guide. To access **Output settings**, you must use the **wrench icon**, but in most cases, you won’t need to change anything. However, **if a game fails to recognize head tracking** (i.e., the look-around axes do not appear in the game’s control settings and headtracking movement doesn’t work in-game), go to the section "**Known issues**" and find "**Freetrack protocol setup**".

Next I will describe settings, which you can open by clicking the “Options” button in main window.

The first tab that appears is called “**Shortcuts**”, where you can define keyboard shortcuts to control the program and adjust certain behaviors. Please note that shortcuts cannot be assigned to external controllers (such as joysticks, throttle quadrants, or steering wheels). To use shortcuts with these devices, you'll need a key emulator, such as JoyToKey.



Each function can have two keys assigned for activation

Center - Sets the current position of the points as the new default. Typically only needed at the beginning of tracking.

Toggle - Pauses camera movement until the key is pressed again. Useful when entering large amounts of information in one area (e.g. multifunction screens in modern fighter jets).

Toggle while held - Pauses camera movement for as long as the key is held down.

Zero - Resets the view to the default position until the key is pressed again.

Zero while held - Resets the view only while the key is being held.

Start tracking - Starts tracking.

Stop tracking - Stops tracking.

Toggle tracking - Toggles tracking on or off with every key press.

Restart tracking - Turns tracking off and then back on.

Center at startup - When tracking is activated, the program sets the initial point positions as the default starting position.

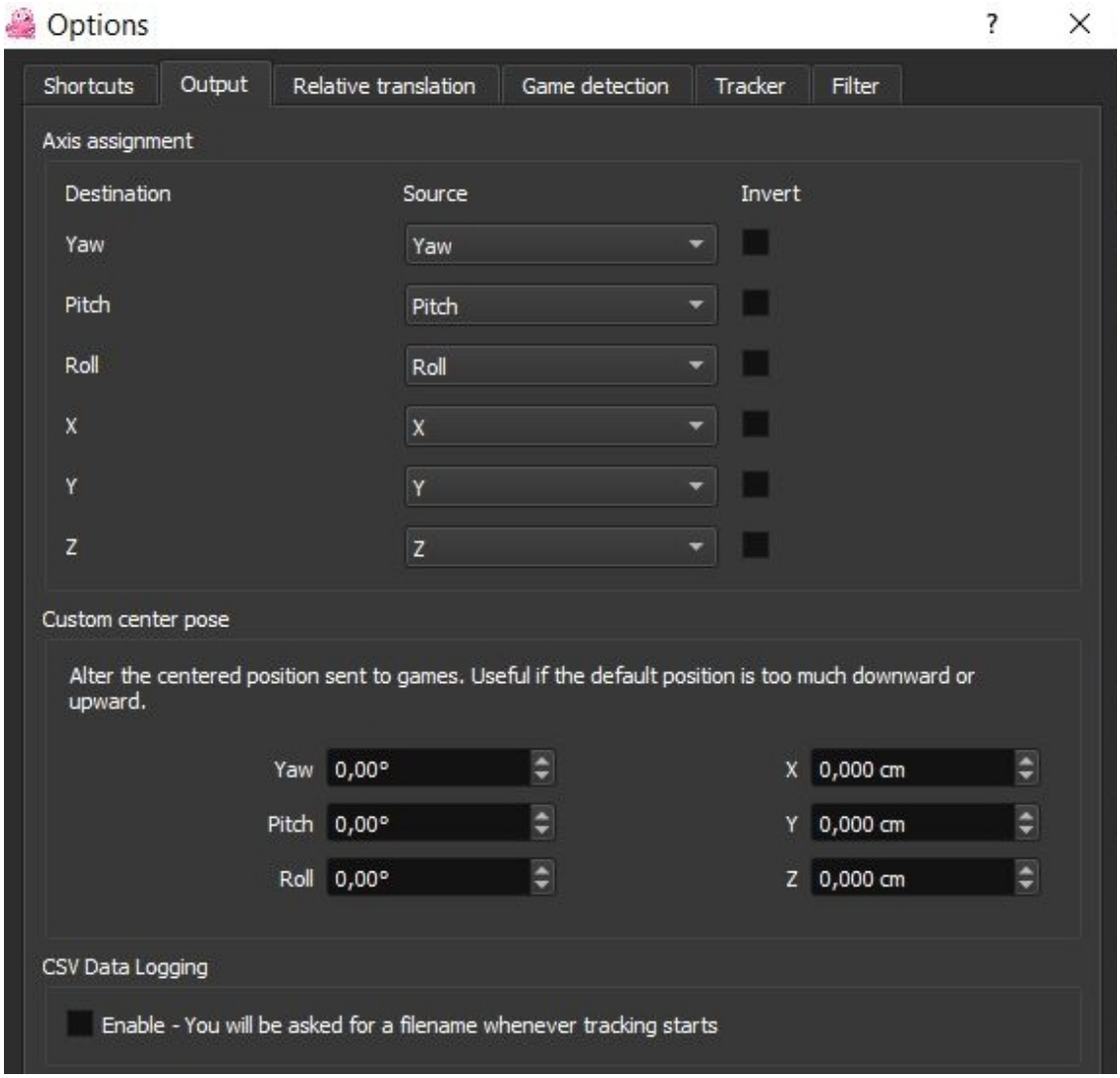
Centering method - Explanation available here: *https://github.com/opentrack/opentrack/issues/1340*

Disable user interface localization - Intended to allow switching the program language, but does not work in version 2023.3.0.

Enable tray - If checked, minimizing the app removes it from the taskbar and hides it in the system tray (accessible via the arrow near the clock). I recommend disabling this option.

Minimize to tray on startup when enabled - Only works if “**Enable tray**” is checked. When active, the program starts minimized in the system tray.

Next tab is „**Output**“. Here you can assign axis of real movement to the virtual axis, invert these axis and change default position of a camera.



Axis assignment:
Destination = The axis the program will move (in the game).
Source = The input axis used to control it.
To **invert** an axis, check the box next to the dropdown menu in the **“Invert”** column.

Axis description:
Yaw – Left-right head rotation (like shaking your head “no”)
Pitch – Up-down head tilt (like nodding “yes”)
Roll – Tilting your head toward your shoulders
X – Side-to-side leaning (shifting your upper body sideways)
Y – Forward-backward leaning (leaning in or reclining)
Z – Vertical movement (crouching or stretching upward)

If you don’t want to use a specific axis, select **“Disabled”** in the source field.
For the best in-game experience, axes should generally be matched directly (e.g., **Yaw = Yaw**, **Pitch = Pitch**, etc.).

Section „**Custom center pose**“ allows you to adjust the default centre position of the camera.
For example, I personally use Pitch -10°, which makes the camera pitch down from true center so that I can see more of the instrument panel by default (not shown in the image).

CVS Data Logging - If enabled, the program will ask you for a filename every time tracking starts, then create a file containing tracking data in CSV format.

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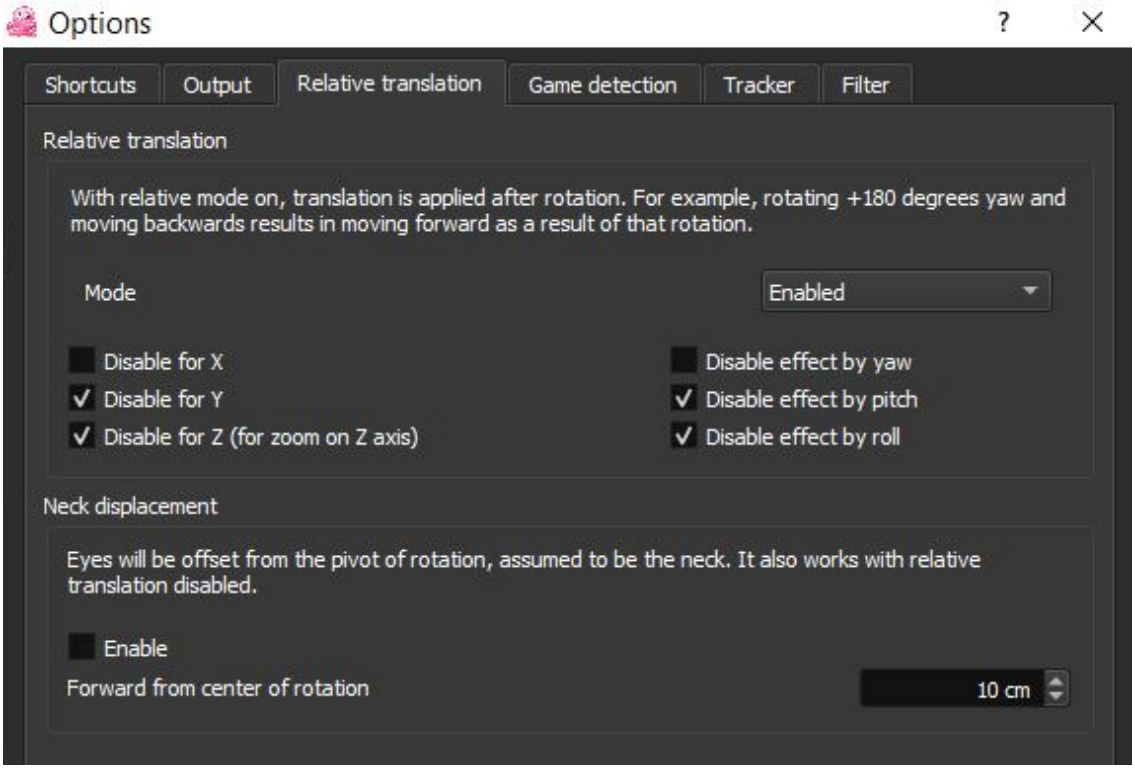
In „**Relative translation**“ you can set different behavior of an axis when it´s turned by 180°.

The only setting that proved useful during my testing was **reversing the yaw axis** when looking behind me in an aircraft cockpit.
This prevented the unnatural movement of having to lean the “wrong” way to look past the headrest. If you find yourself leaning in the wrong direction when turning around, enabling this feature will correct the movement.

You can enable it by setting the dropdown on the **right side** to **“Enabled“** and checking all boxes except “**Disable for X**” and “**Disable effect by yaw**”**.**



Neck displacement - This setting theoretically moves the virtual eye position forward by a chosen number of centimeters (to simulate the natural offset between your eyes and the rotation point at the neck). However, in my testing, values between 5 and 30 made no noticeable difference, so I keep this option disabled.

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Game detection tab allows you to configure automatic tracking activation with a specific profile when a selected game is launched. In essence, you're telling the program: "If this game starts, load this profile and start tracking."

For the purposes of this manual, I configured two games with two different profiles.

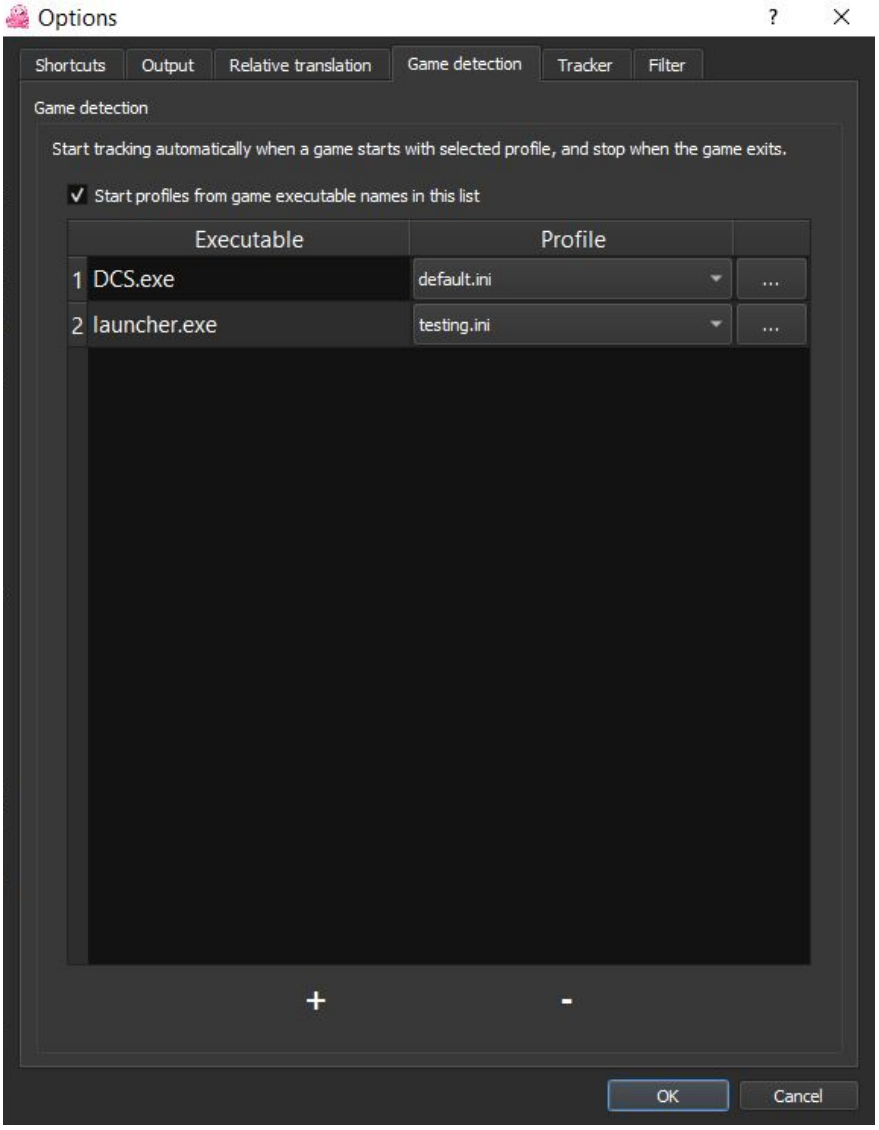
Creating a New Rule

- Click the "**+**" button at the bottom of the window.
- Click the "**...**" button on the right side to open a file browser where you can locate the game's executable file.

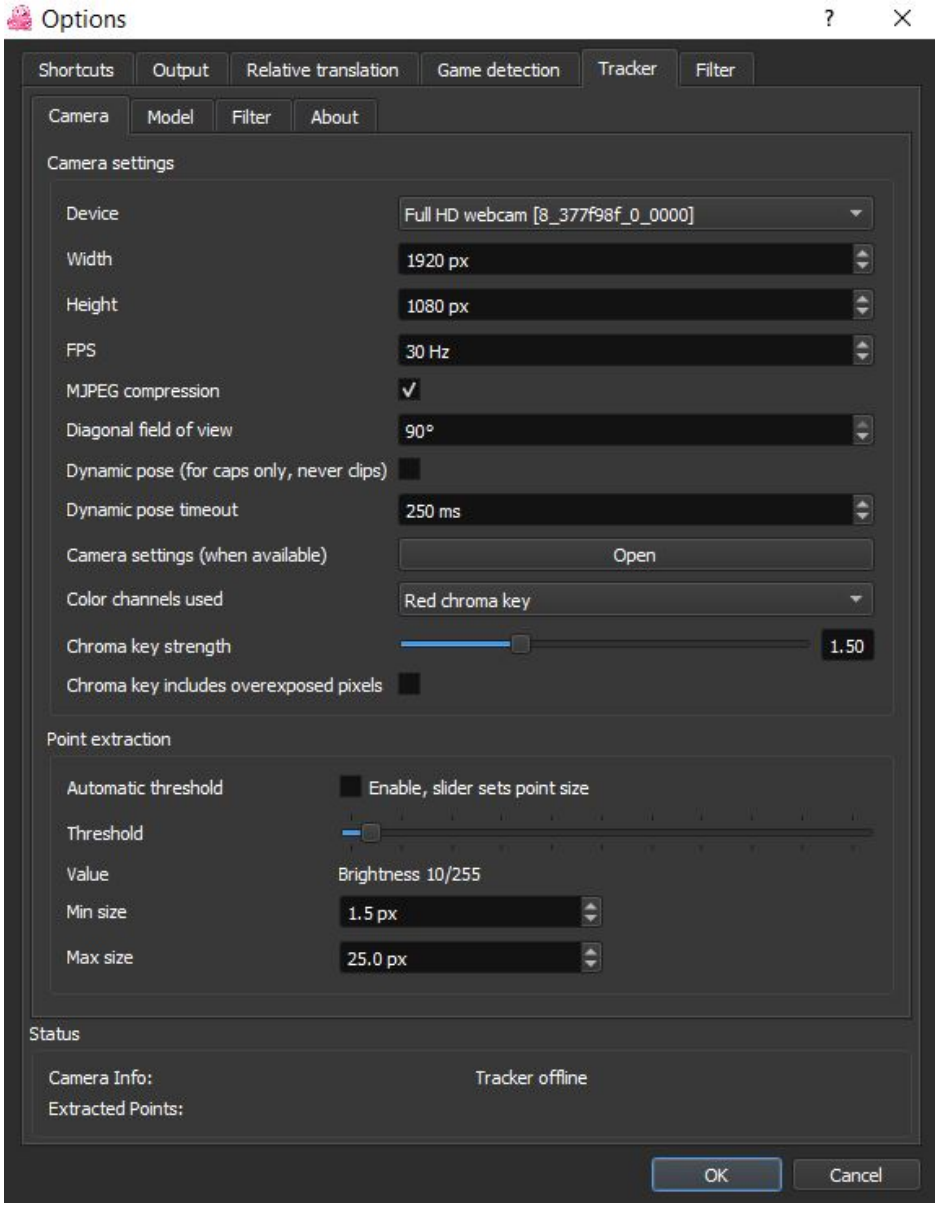
  *You can find the executable by right-clicking the game's desktop shortcut and selecting "**Open file location**" then copying the path. If the game is installed through Steam or another platform, you may need to manually locate the file in the game's folder. For example, I found DCS.exe here: G:\Steam\steamapps\common\DCSWorld\bin*
- In the dropdown list, select which profile should be used for the game.
- Once you've selected the application and the profile, make sure the box at the top labeled "**Start profiles from game executable names in this list**" is checked.
- Click "**OK**" to confirm and save your settings.

Removing a rule

- Click on the left side of the entry you want to delete.
- Click the **"–"** button at the bottom of the window.
- Click **"OK"** to save the change or **"Cancel"** if you deleted the wrong entry.



I already described the „**Camera**“ sub-tab in the „**Tracker“** tab, but this page will contain additional information not described in the simplified setup.



FPS – Stands for frames per second. Most webcams typically run at 30 FPS, which is perfectly sufficient for smooth tracking. If your camera supports a higher frame rate, you can increase the limit accordingly.

MJPEG Compression – Enables image compression. In my experience, disabling this results in worse tracking quality, so I **recommend keeping it enabled**.

Diagonal Field of View – The diagonal angle of the camera's field of view. This value can usually be found on the manufacturer's or seller's product page, often labeled as *FOV*. It's important for the correct calculation of movement of tracking points.

Dynamic Pose – Only relevant when using the "Cap" frame shape.

Dynamic Pose Timeout – Dependent on the previous setting and is ignored unless *Dynamic Pose* is active.

Color Channels Used – Defines which color the program tracks in the video feed. I achieved the best results with **"Red chroma"**, which tracks red and similar shades, and successfully filtered out unwanted signals, including sunlight reflections. If the software struggles to track the tracking points, try **"Red only"**, which restricts detection to pure red tones only.

Chroma Key Strength – Adjusts how red a pixel must be to be included in tracking.

Chroma Key Includes Overexposed Pixels – When enabled, the program includes overexposed (too bright) pixels in tracking.

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Known issues

Game does not recognize headtracking / Freetrack protocol setup

Some games might not detect that you're trying to use headtracking, and you'll need to change how the program presents itself to the game. If that happens:

- In the main window of **Opentrack**, next to the **Output** dropdown, click the **wrench icon** to open protocol settings.
- In the new window, expand the top dropdown under **"Select interface"** and select: **“Use TrackIR, disable freetrack”**
- Click **OK**, restart both the program and the game, then start tracking and launch the game again.

If this doesn't solve the issue:

- Reopen the same settings window and select: **“Use freetrack, disable TrackIR”**
- Click **OK**, restart the program and game again, then start tracking and relaunch the game.

The game should now recognize the headtracking axes and display them in its control settings.
If this still doesn’t help, make sure that the game actually supports headtracking than you restart your computer and try again using the original option **“Enable both”.**

Image jumps or jitter when looking straigh up

Some games cannot display the "look up" view beyond approximately 130°. Once that threshold is exceeded, the game may rapidly switch between „looking up and back“ and „looking up and forward“, causing the camera view to jump erratically.
To prevent this, lower the maximum Pitch value in your curve settings.

Webcam changes settings unexpectedly / after every restart of a system

Some webcams may change settings without reflecting that change in the interface—typically after a system restart. You’ll notice this if the image looks different when starting tracking.
To fix it:

- Go to „**Options** > **Tracker** > **Camera settings** > **Open**“
- Adjust the setting to your saved settings (move the value even if it is correct to refresh it)
- Click „**Apply**“ to confirm changes
- Start tracking

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List of tested webcams

If your webcam is not listed here, it does not automatically mean it is unsuitable. The list only includes webcams I have personally tested, so I can confirm their compatibility.

If you are using a webcam that is not yet on the list and would like to help others, please send me an email at „**support@ledtrack.eu**“ with the subject line „**List of tested webcams**“ including the model of your webcam and a photo showing the webcam with the light filter attached for verification.

If you want to verify whether your webcam is compatible with LEDTrack before buying, follow these steps:

1. Install the Opentrack program according to the instructions on page 9 of this manual.
2. In Opentrack, check whether you have access to manual camera settings. You can find these settings by navigating to: Options (in the main window) >Tracker >Camera >Camera settings >Open

The settings window should ideally look like the one shown on page 20, but most importantly, it must allow you to manually adjust **brightness**, **contrast**, **saturation**, **gain** and **exposure**. If these parameters are available and adjustable, your webcam is most likely suitable for use with LEDTrack.

Brand and model of the camera	Suitable?	Notes
Ausdom AW615	Yes	
SriHome SH001	No	Can´t change settings manualy

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