

MOTION
HEATMAP
ANALYZER

USER DOCUMENTATION

JANUARY 2022

Contents

Introduction	3
Analysis formats	4
Work with Webcam	5
Work with Video	6
Work with Unity Cam	7
Functionalities	8
Contact	10
Licensing	11

Introduction

Thank you for purchasing Motion Heatmap Analyzer. Our team work in any product related to virtual environments and visual communication, like 3d assets, renders, virtual videos, interactives, VR experiences, 360 tours or augmented reality apps. You can find some examples on our website www.sg-digital.cat

Working on data visualization in the videogame industry, we have developed this asset that helps to study, in an intuitive way, motion in a webcam, video or 3d scene. This asset shows screen areas with more motion, using a heatmap 2D image overlapped on the screen.

A heatmap is a data representation technique that measures the magnitude of motion and displays the area and frequency of motion through a color code that allows to interpret quickly the results.

This motion heatmap asset is useful for detecting movements, the directions of some flows of objects or people and, for example, an aid for architects while projecting common areas, check the correct operation of a machine or robot or analyze car flows. Is useful in various sectors, like improve work processes in the industry, understand the movements of nature or the behavior of animals, evaluate the traffic, analyze the movements of athletes or visualize motion detected by a security camera.

We have made the effort so that the result is relative to the time of use of the application, and to avoid applying absolute values that do not depend on the time of use. Thus, if one area of the screen begins to be used more than the rest, this area will be updated with the most intense values, while the remaining areas decrease the intensity, a fact that makes the analysis real and dependent on the time of use of each scene.

Please remember, it's important for us to have feedback from people like you to improve our products or have a good review in the asset store. Please check out ways that you can directly communicate with us, at the end of this document.

Enjoy the product!

The SG-DIGITAL Team.

Analysis formats

The asset is prepared to be easy to apply and use in any Unity project.

You can use it for three different formats: webcam, video and unity camera for a 3d scene.

- Webcam format: ready to analyze movement of objects or people in real time using webcam. You can get the most out of using it on mobile devices, such as smartphones.
- Video format: you can use any video format compatible with unity (using the Unity video player gameObject) and analyze the movement of the imported footage.
- Unity Cam format: you can analyze the movement of gameObjects in a scene through the unity camera.

In all formats you can easily stop the analysis at any time, reset the calculation, show or hide the analysis, make screenshots and change the gradient of the colors used.

Work with Webcam

To set the asset, you first need to put **WebCamMotionDetection** (Fig. 1) prefab in your scene, that you can locate in “prefabs” folder. This prefab is in charge of processing the webcam image and analyze it (you can see the details of the possibilities in the functionalities section).

The second step is to put **MotionShowUI** and **HeatmapImage** prefab in the slots with the same name, in order to visualize pixels with motion and the analysis result.

When the application starts, it detects pixels with movement and creates a heatmap in real time, so it updates the value of the colors based on the total time used each time.

The asset supports all screen resolutions and you can change the calculation precision, changing *Tex Resolution* parameter, to improve the performance. This is very useful in the case of mobile devices with less processing capacity.

You can use “webcam_color” material in *WebCamMotionDetection* mesh renderer if you would visualize background in color, or “webcam_BW” material if you prefer black and white background.

It also includes a scene named “*Motion WebCam Heatmap*” to test the asset with predefined buttons. Buttons allow quickly take screenshot or continuous shooting (very useful for mobile devices), hide heatmap, reset colors and play/stop the analysis. You can explore the possibilities of the asset in this scene and configure the best visualization for your project.

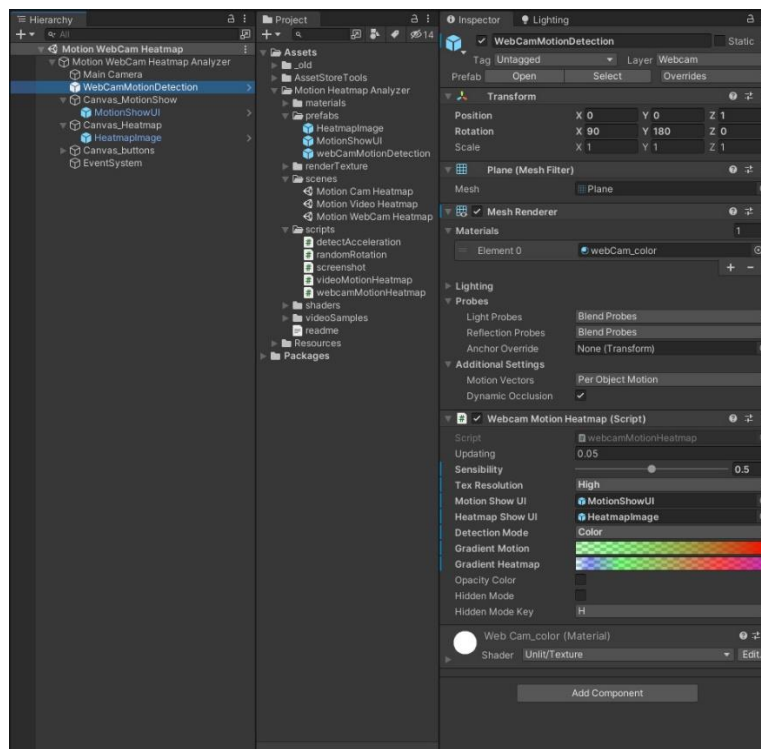


Fig 1. Motion WebCam Heatmap configuration

Work with Video

To set the asset, you first need to put **VideoMotionDetection** (Fig.2a) prefab in your scene, that you can locate in “prefabs” folder. This prefab is in charge of processing the video image and analyze it (you can see the details of the possibilities in the functionalities section).

The second step is to put **MotionShowUI** and **HeatmapImage** prefab in the slots with the same name, in order to visualize pixels with motion and the analysis result.

You also have to configure a Video Player gameObject (Fig.2b) to set the video. This gameObject have to use “video Render Texture” in the Target Texture slot, that you will locate in renderTexture folder.

When the application starts, it detects pixels with movement and creates a heatmap in real time, so it updates the value of the colors based on the total time used each time.

The asset supports all screen resolutions and you can change the calculation precision. It's recommended to use low resolutions of *video Render Texture* size, to improve the performance.

You can use “*video Material_color*” material in VideoMotionDetection mesh renderer if you would visualize background in color, or “*video Material_BW*” material if you prefer black and white background.

It also includes a scene named “*Motion Video Heatmap*” to test the asset with predefined buttons. Buttons allow quickly hide heatmap, reset colors and play/stop the analysis. You can explore the possibilities of the asset in this scene and configure the best visualization for your project.

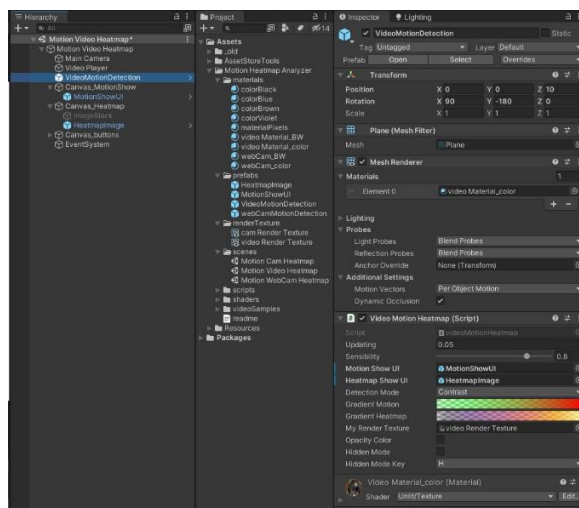


Fig 2a. Motion Video Heatmap configuration

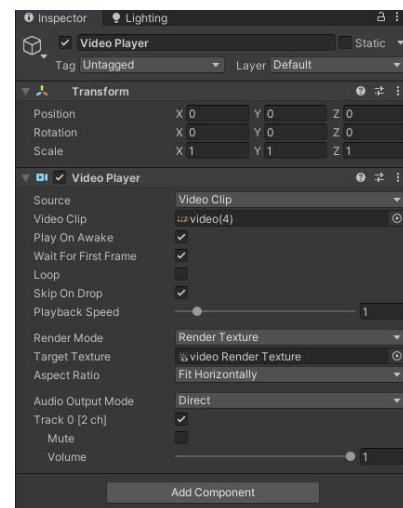


Fig 2b. Video Player configuration

Work with Unity Cam

To set the asset, you first need to put **CamMotionDetection** (Fig.3) prefab in your scene, that you can locate in “prefabs” folder. This prefab is in charge of processing 3d scene image and analyze it (you can see the details of the possibilities in the functionalities section).

The second step is to put **MotionShowUI** and **HeatmapImage** prefab in the slots with the same name, in order to visualize pixels with motion and the analysis result.

You also have to put “cam Render Texture” prefab in *My Render Texture* slot, that you will locate in renderTexture folder.

When the application starts, it detects pixels with movement and creates a heatmap in real time, so it updates the value of the colors based on the total time used each time.

The asset supports all screen resolutions and you can change the calculation precision. It’s recommended to use low resolutions of *cam Render Texture* size, to improve the performance.

It also includes a scene named “*Motion Cam Heatmap*” to test the asset with predefined buttons. Buttons allow quickly hide heatmap, reset colors and play/stop the analysis. You can explore the possibilities of the asset in this scene and configure the best visualization for your project.

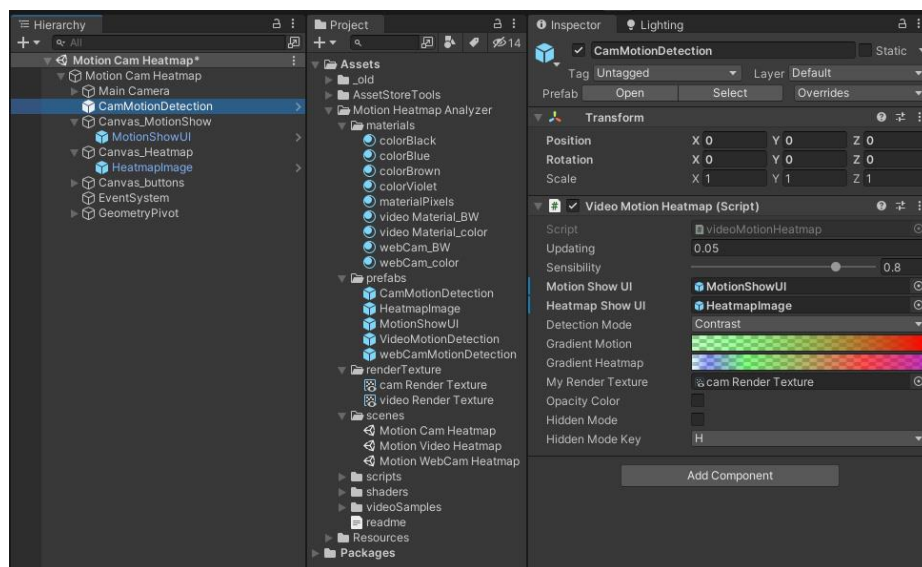


Fig 3. Motion Cam Heatmap configuration

Functionalities

The following functionalities can be configured (*Fig.4*):

- **Motion Show UI:** slot where you have to put the prefab with the same name. UI Image that represents motion colors.
- **Heatmap Show UI:** slot where you have to put heatmap image prefab. UI Image that represents heatmap colors.
- **Detection Mode:** there's two ways to detect motion: taking into account the pixel color change or taking into account the pixel contrast change.
- **Updating:** are the times that the system updates motion detection per second.
- **Sensibility:** is the degree of sensitivity to motion detection. More value, more sensitivity of detection.
- **Texture Resolution:** (only for webcam mode) allows modifying the resolution of the 2D image, so the calculation of the values is also simplified, reducing the precision of the representation, but improving the performance (Very high = 100%, High = 50%; Medium = 25%; Low = 12.5%; Very Low=6,25%).
- **Gradient Motion (*Fig.6*):** represent the values with the specified set of colors. This is used only if "Opacity color" is not set. The colors on the left are the colors that represent the areas where the user has less interaction, and those on the right, the areas with more interaction. You can personalize the ramp with your own colors.
- **Opacity Color (*Fig.5*):** represent the values with a single color with different opacity. More transparent for areas less used and opaquer for the most used areas.
- **Gradient Heatmap:** represents the values with the specified set of colors. The colors on the left are the colors that represent the areas with less movement, and those on the right, the areas with more movement. You can personalize the ramp with your own colors.
- **Render Texture:** render texture used by Unity camera or video target texture.
- **Hidden Mode:** allows you to view the result on the screen or just do the calculation in hidden mode, to play without colors and improve performance.
- **Hidden Mode Key:** selectable key for switch hidden mode.

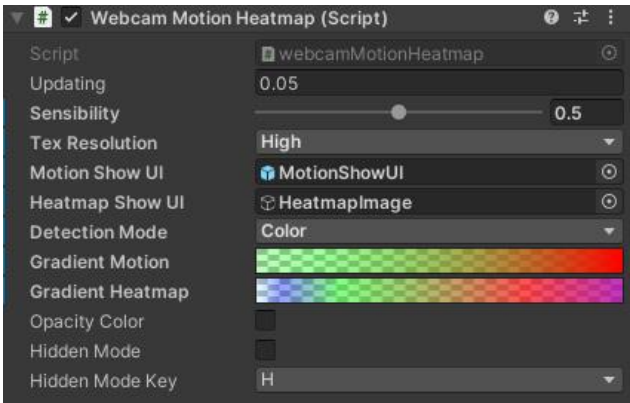


Fig 4. Motion Heatmap dialog

Contact

If you have any problem working with the asset, you can email our support team directly. Our email address is sgdigital.barcelona@gmail.com.

Please note the following when emailing support for quickest service:

1. We need 2-3 days to process email support requests.
2. For fastest service, please provide your Unity Asset Store Purchase invoice number for our product.
3. Put the invoice number in the subject field, with brief description of the problem.
4. In the body of the email, please provide as much of the following as possible, for quickest service:
 - Detailed explanation of the problem. Provide screenshots if possible.
 - It's important to know what version of Unity do you use.
 - Sequence of events leading to issue.

Licensing

Licensing for Motion Heatmap Analyzer is governed by the Unity Asset Store End User License Agreement (EULA). For more information about the EULA, please [click here](#) for more details.