Unity Sentis Insights SDK

Reference Manual

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Document history

Date	Main Changes
22 Nov 2024	v1: First release

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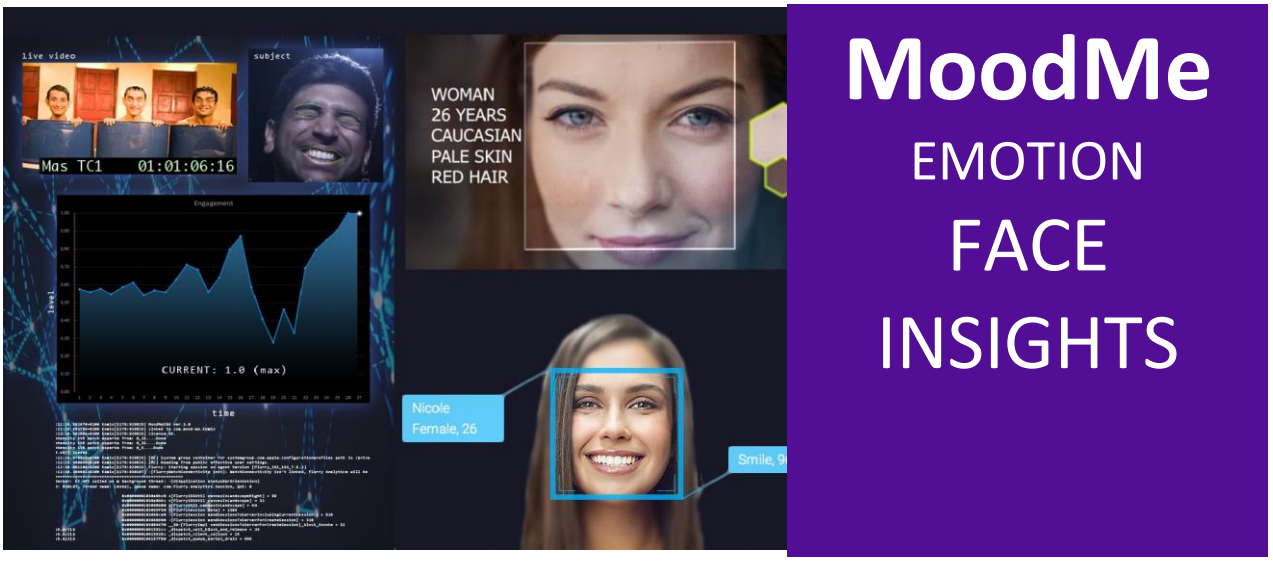
Distribution: ***Customers***

Welcome to MoodMe

Unity Sentis Insights SDK



MoodMe Emotion SDK

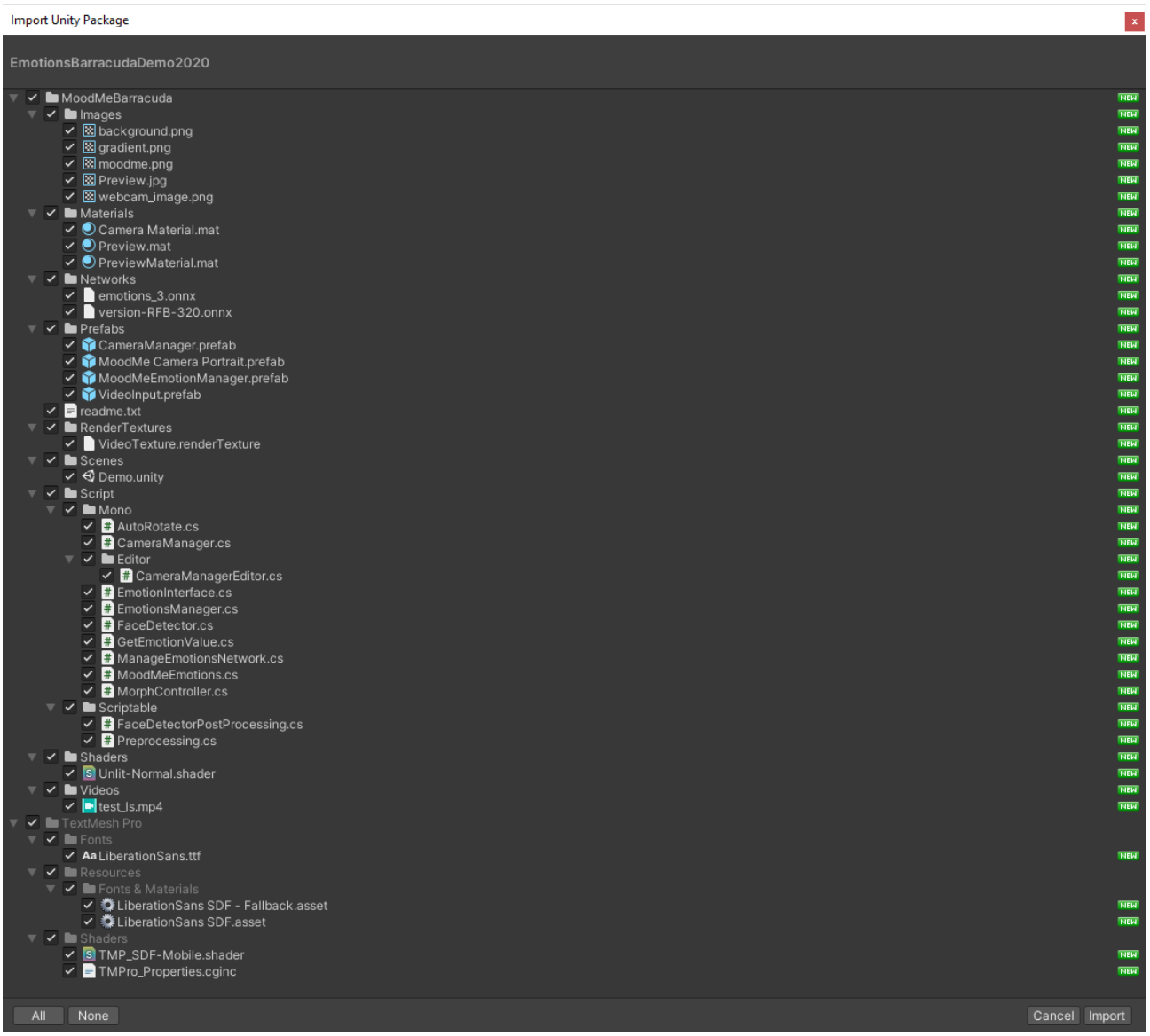
MoodMe Emotion Detection SDK is an extension of MoodMe SDK. It is capable of detecting 7 different emotional states of a person: happy, surprised, angry, sad, afraid, disgusted & neutral. Each emotion is ranked on a 0-1 scale and the sum of all of them must be 1.

UNITY 3D SENTIS SDK

Import the plugin:

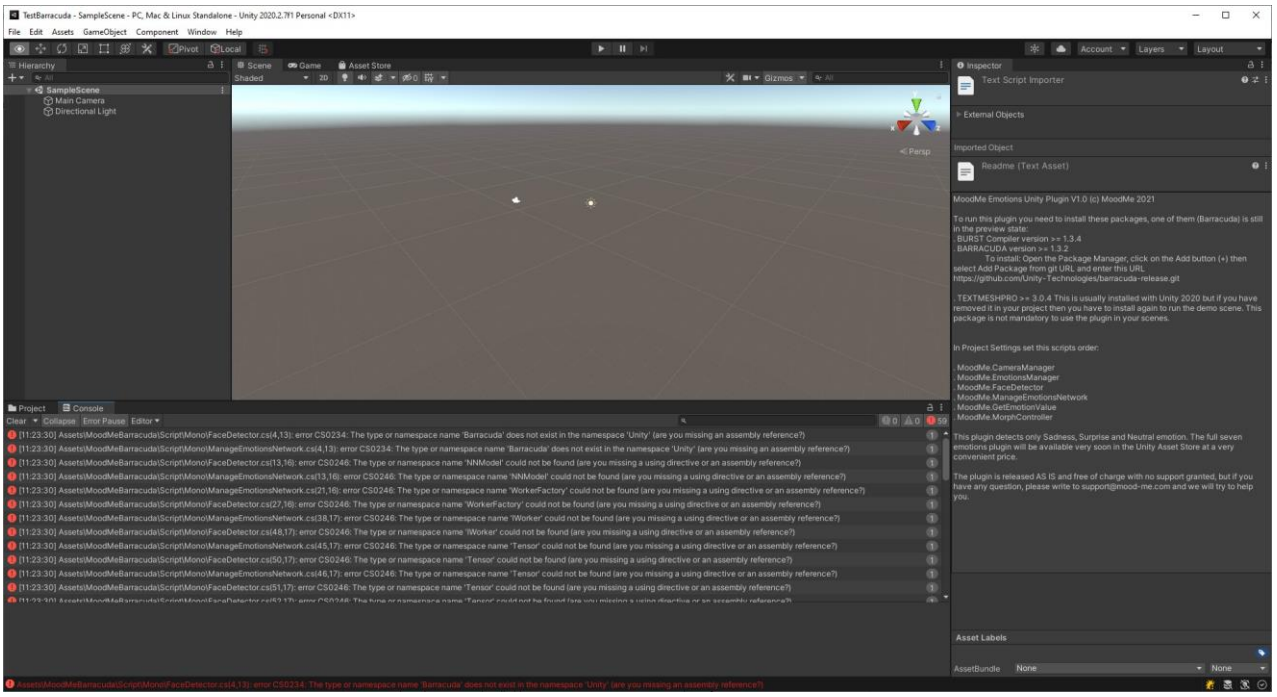
Download from the Unity Asset Store and import.

The package will create the following files and folders:



(the content may vary depending on the demo or full version)

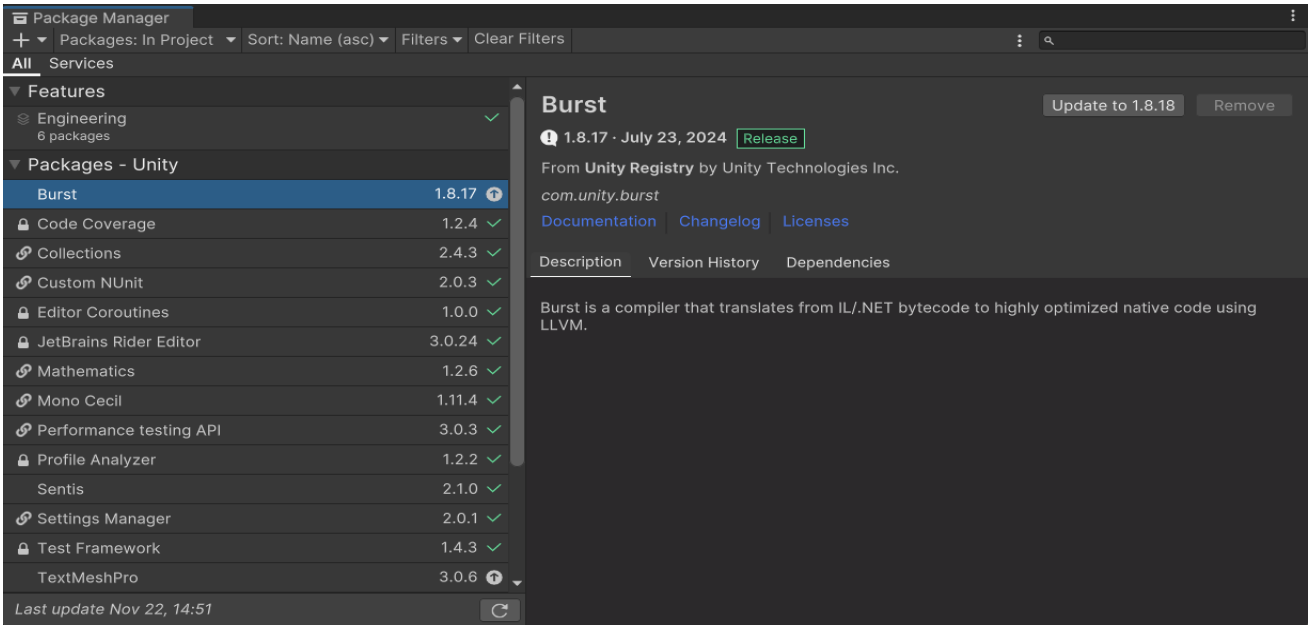
After the import you will get some errors, don't panic and read the readme file carefully.



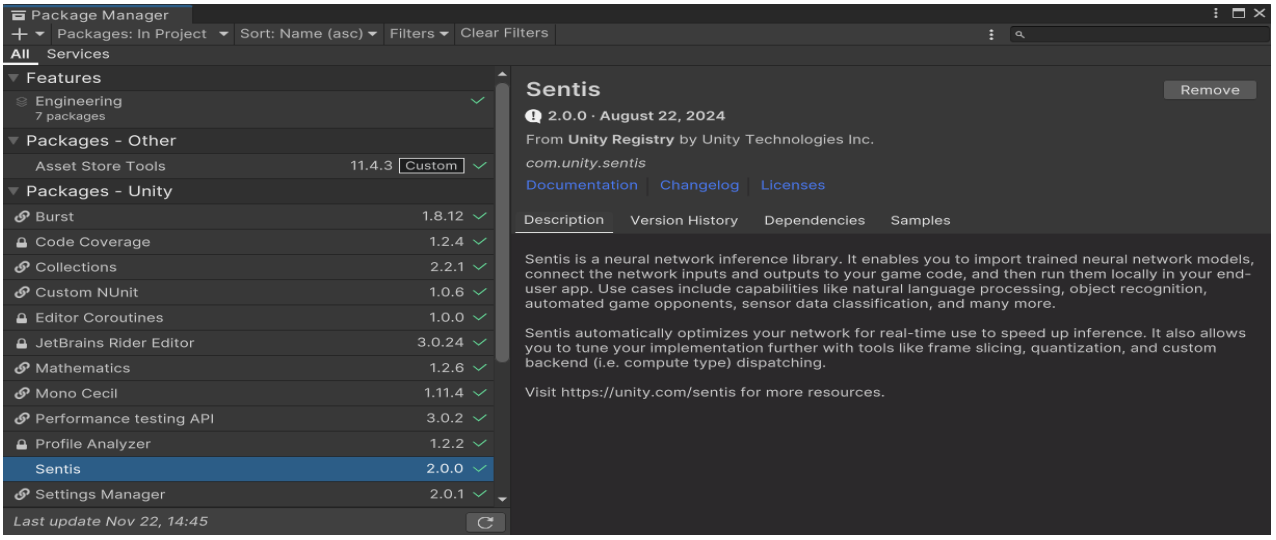
Configure the plugin

Install the packages from the Package Manager

First BURST

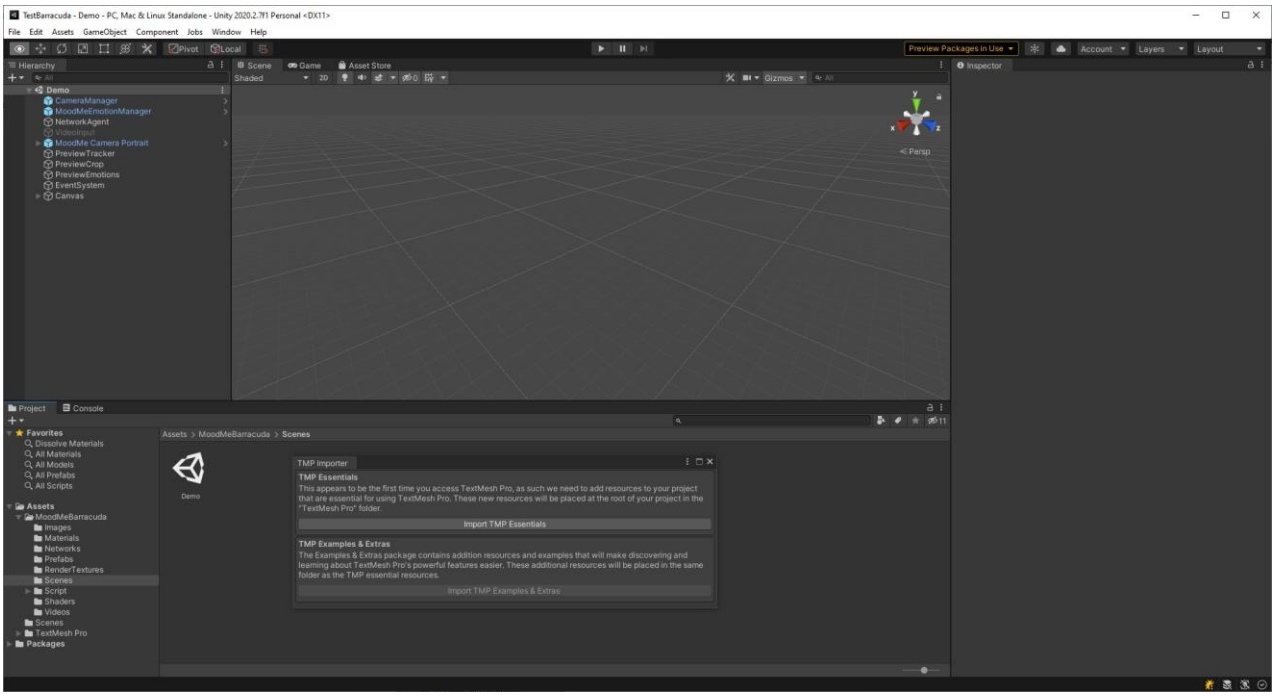


Then SENTIS

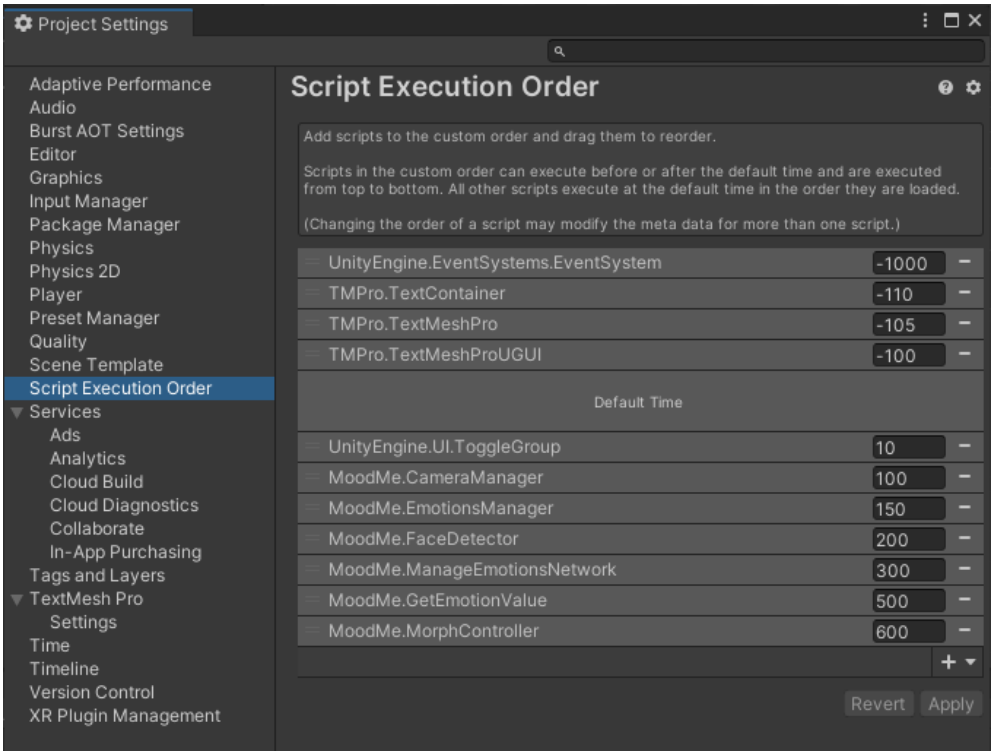


If you have any issue installing Sentis, more information can be found at this link: https://docs.unity3d.com/Packages/com.unity.sentis@2.1/manual/install.html

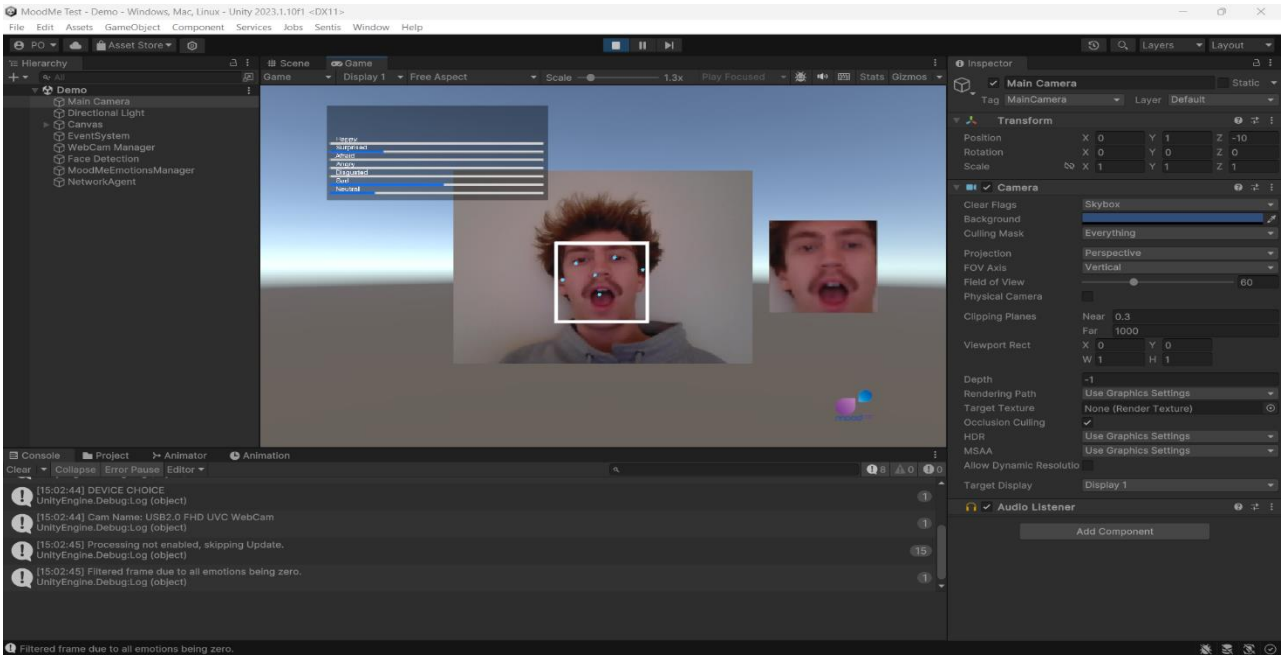
Now open the Demo scene. You will probably be asked to Import TextMeshPro Essentials. Click on Import then close.



Following the Readme file, now go to Project Settings -> Script Execution Order and check if the list is compliant with the readme file

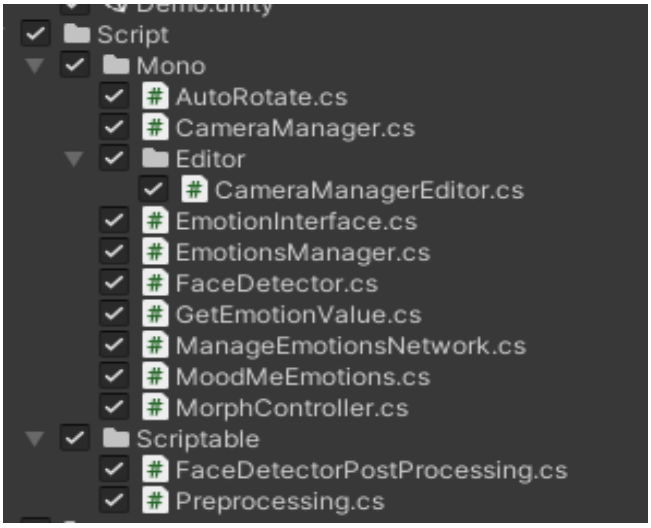


Now if you press the Play button, the application will open your webcam and start to track your face and detect your emotions.



The main part of the plugin is the scripts and the prefabs.

The scripts and components:



The main script is **`EmotionsManager.cs`** which is the script that will handle the Emotion Engine and anything you will need to test the engine or to derive from it your own script.

The video source is handled by **`CameraManager.cs.`** You can derive from it your own script to handle specific kinds of input.

`EmotionInterface.cs` is the bridge between Unity logic and engine logic. You don't need to edit this file.

`MoodMeEmotions.cs` is a basic class. Keep this file as-is.

`FaceDetector.cs` handles the neural network that detects faces from an image.

`FaceDetectorPostProcessing.cs` handles the output of the neural network that detects faces from an image and returns a list of faces coordinates and probabilities.

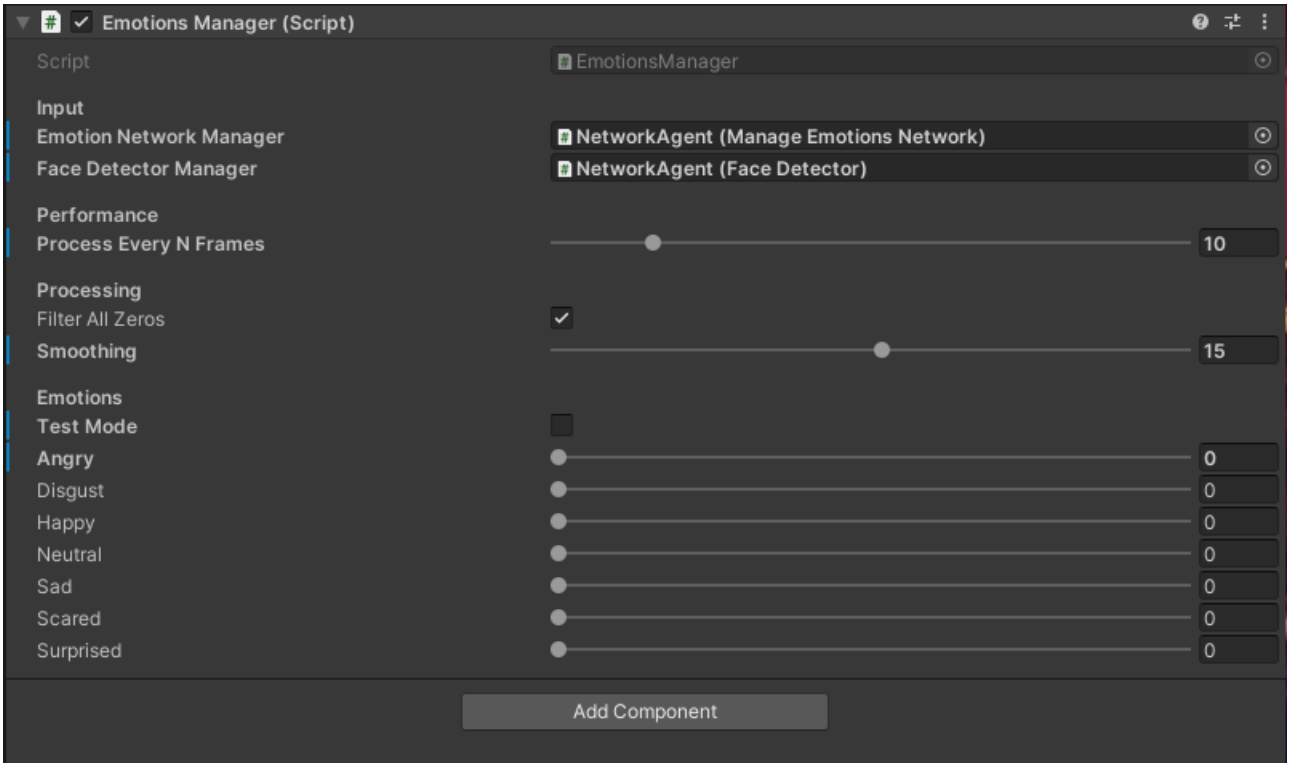
`Preprocessing.cs` is a class that handles some common tasks like rotations, scale, image formats conversion.

`ManageEmotionNetwork.cs` handles the neural network that detects emotions from an image.

`GetEmotionValue.cs` is a simple script used in the demo scene that fetches a value from the EmotionsManager and writes it to the value property of a UI Slider. Use it to learn how to read emotions' value.

The main script **`EmotionsManager.cs`** is the main component of the prefab **`MoodMeEmotionsManager`** that is mainly an empty Game Object with this script attached.

The script presents the following properties:



`Input` is the section where you will refer the Face Detector and Emotions Detector components in the scene.

`Process Every N Frame` is a parameter to help not waste all the CPU/GPU time with emotion detection, which is a very intensive task. Default is to process a frame every 15, that is a good trade-off. A smaller value will result in more sensible detections at the cost of more CPU time. A bigger value will spare CPU time but the detection will be less sensitive to quick variations.

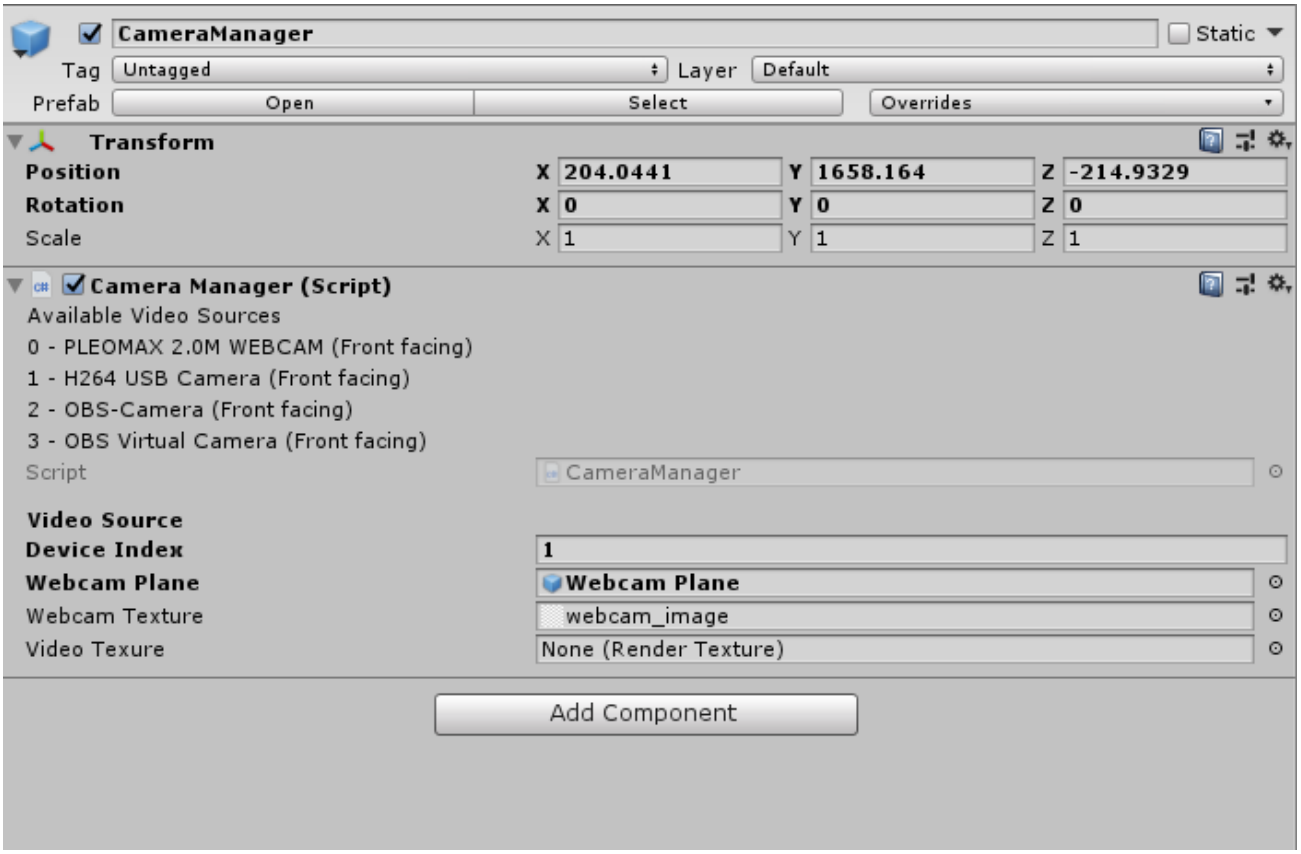
`Filter All Zeros` is a flag that tells the script to ignore when the engine outputs all zeros in case of the wrong detection.

`Smoothing` is the magnitude of the smoothing weight. The range is from 0 to 29. 0 means no smoothing and a lot of noise, and 29 means quite no noise but very damped variations.

`Test Mode` is a flag that, if enabled, will detach the engine from the final output and will use the values below instead. This is a helper in the development phase when you can change manually the output to test your implementation.

The ***emotions sliders*** at the bottom will show the values from the engine or will be used to input the data directly if the flag above is set. They have a debug functionality and nothing else.

The prefab **`MoodMeCameraManager`** that is mainly an empty Game Object with this script attached that handles camera input and Video input.



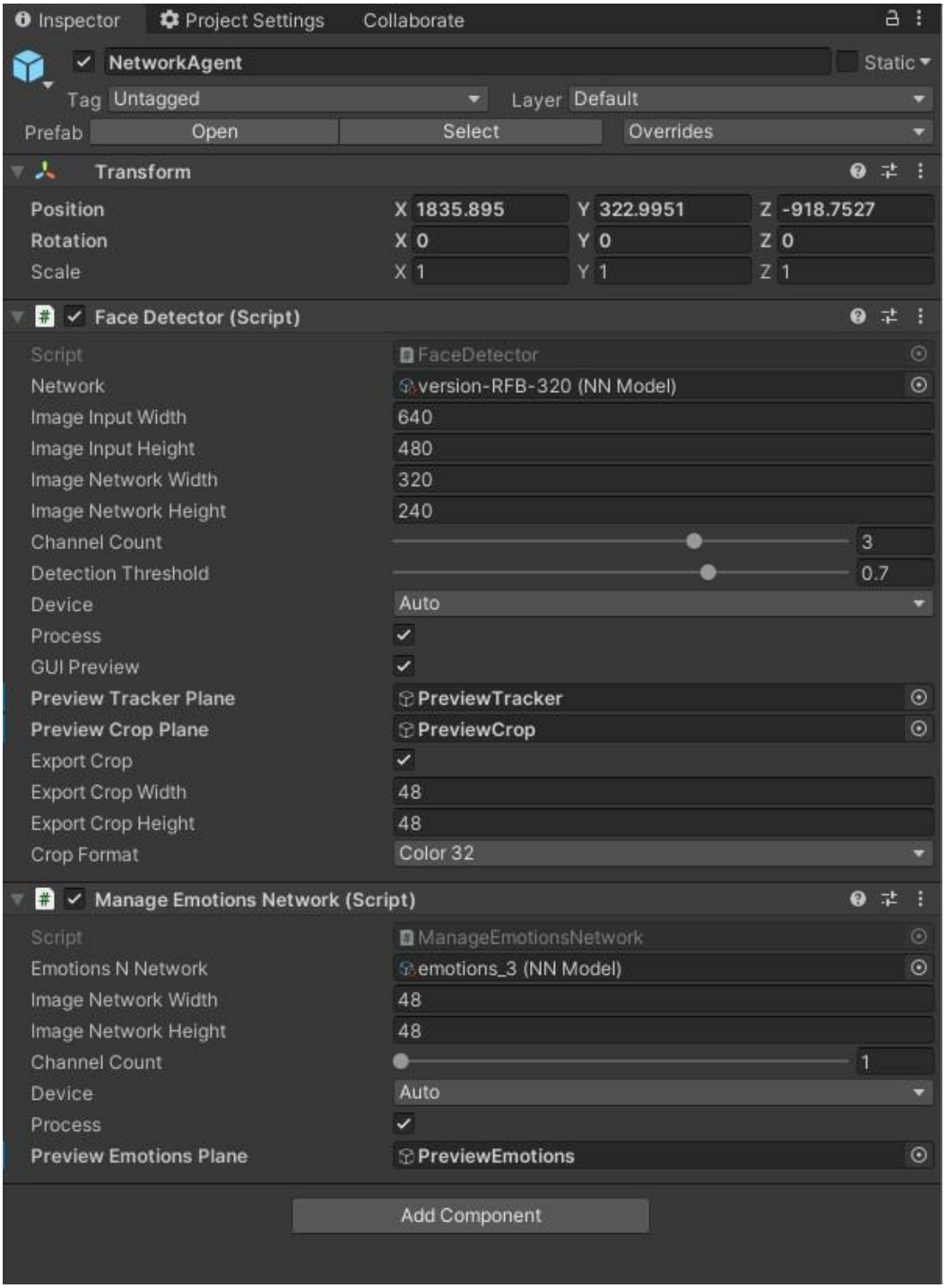
The list at the top is a list of the available video sources (webcams). The number of the selected source must be entered in the **`Device Index`** property.

`Webcam Plane` refers to the quad that is in front of the camera that shows the video stream. This script is a kind of helper so you are free to change if you want a different approach.

`Webcam Texture` refers to the texture that will be filled with the video data.

`Video Texture` (optional) can be referred to as a Render Texture where a video player will render a video file. This way you can use a video in the development phase instead of a webcam source. If this property is empty, the webcam will be used.

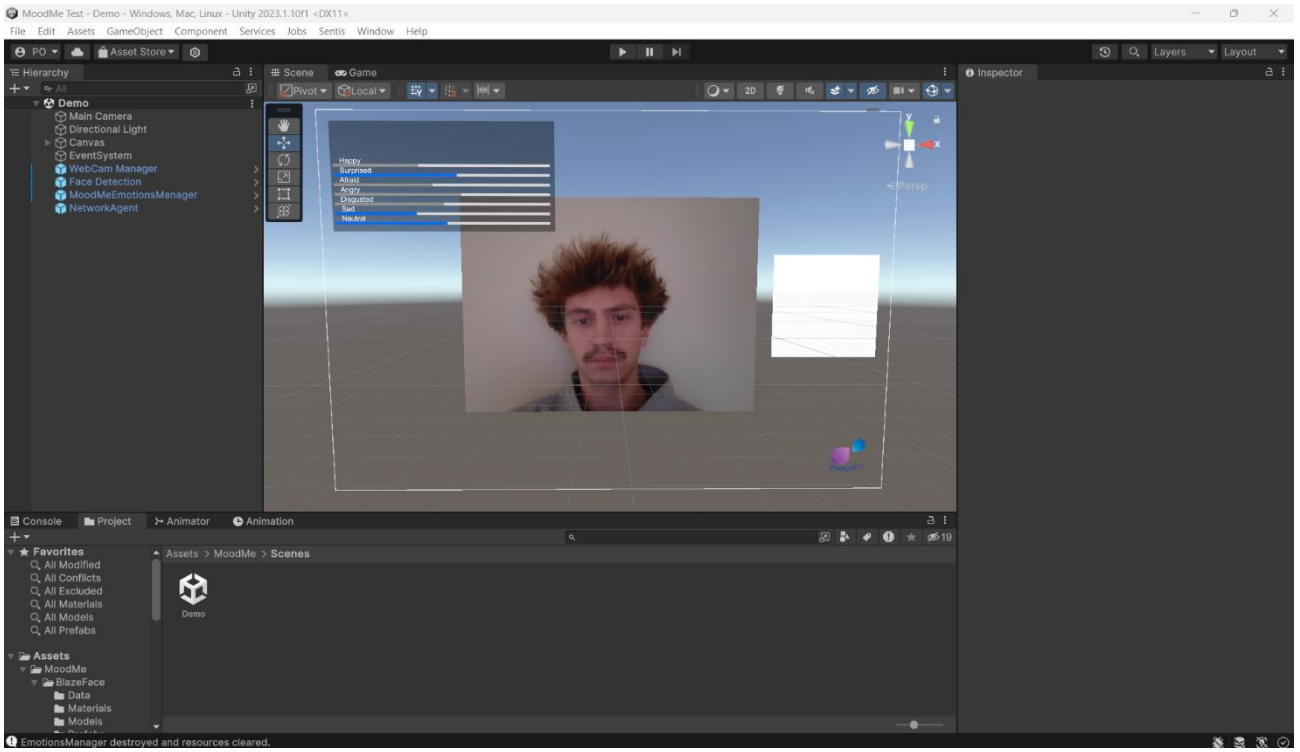
`Network Agent` is the prefab that handles the 2 neural networks that are needed to make this plugin to work.



The components are already configured in all their parts but if you want, you can play with the threshold in the face detector component. The lower the value the more sensitive and prone to errors the detection will be.

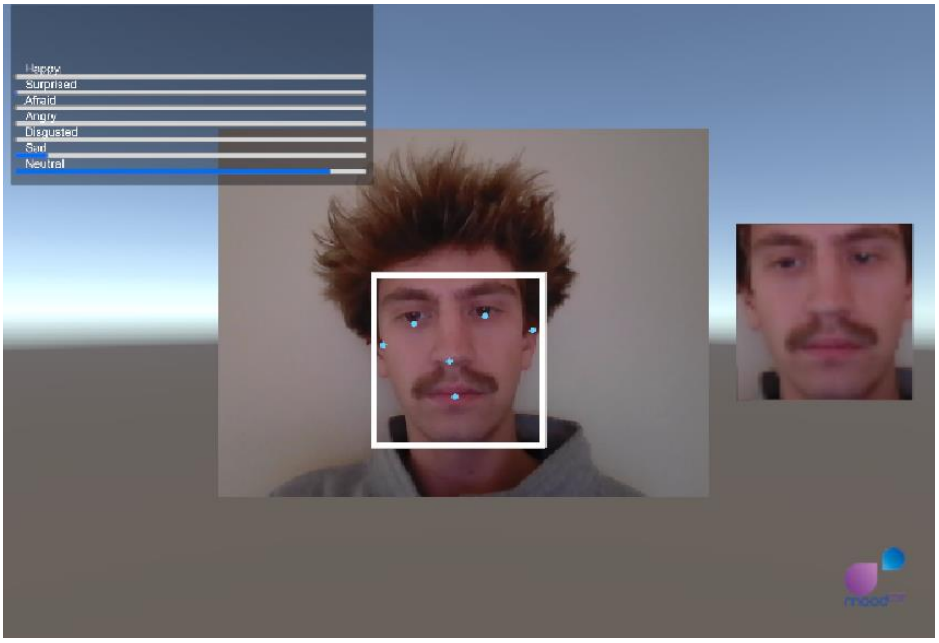
You can also deselect the preview parts if you don't need that service.

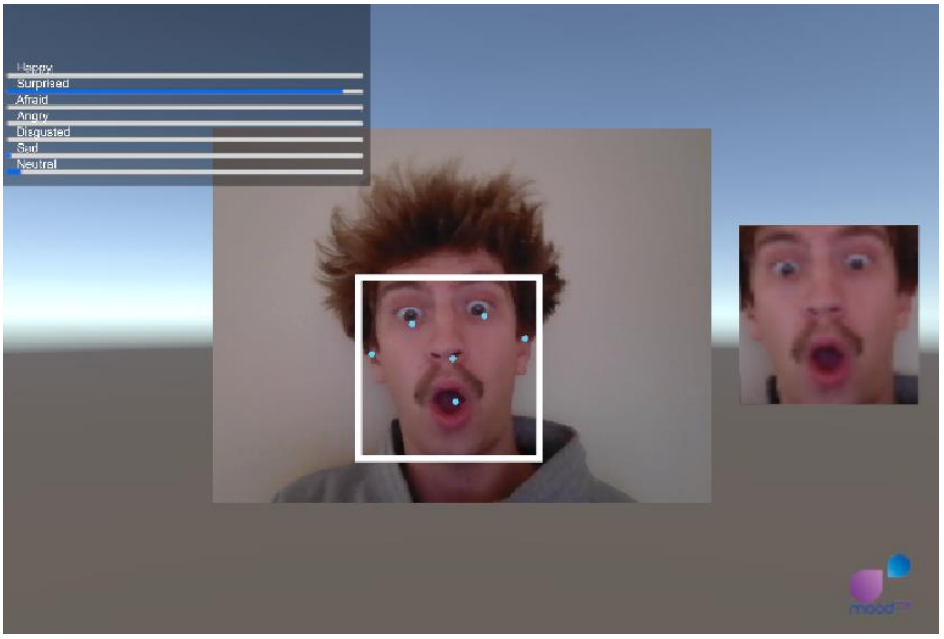
The demo scene



The scene is composed in a way that will show you the final results and the intermediate steps.

Examples:


Happy
Surprised
Afraid
Angry
Disgusted
Sad
Neutral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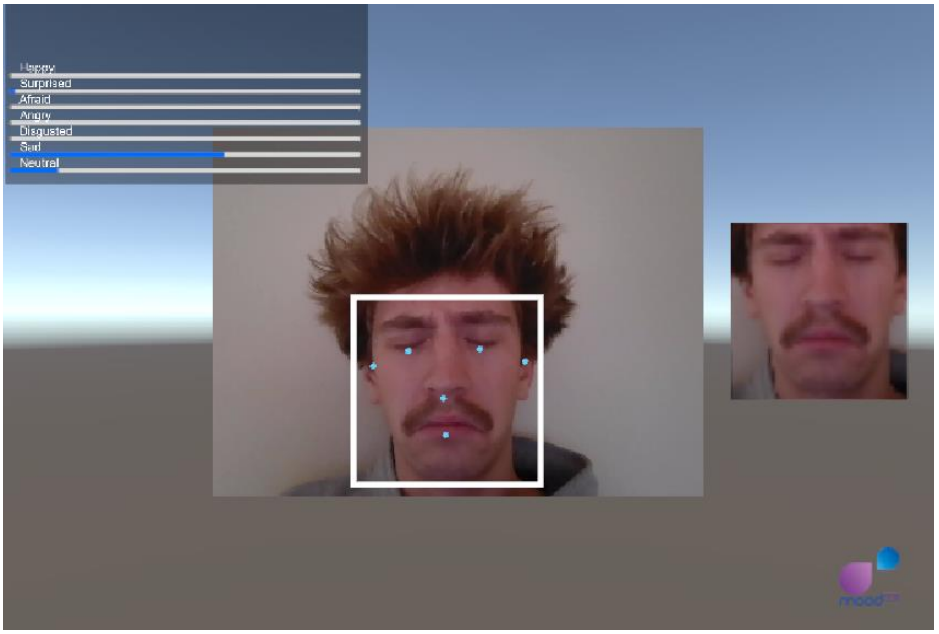
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