

PARALLAX PROJECT
SILVANA CALLEGARI
2018

PARALLAX PROJECT

Critical VR - Summer semester 2018.

The Parallax Project is a Virtual Reality work, in which the user adopts the role of the Dasein, character described by Heidegger as an archetype of a human being. In this case the Dasein will undergo a journey to hyperreality in search for its authenticity. It immerses itself in the endocolonization (the technical colonization of the body), the Nigredo stage, where tools such as the tracking system, the VR platform, and an Arduino lead the Dasein into a full immersion on virtuality and it, by inspecting and manipulating its surrounding virtual space, finds its *doppelgänger*, a mirror of itself, an autoscopy of its bodily existence on the hyperreal realm. Such experience will disjoint the user from its usual point of view and will make it adopt the perspective of the Other, the user will end by looking at itself as the Other looks and perceives it, but not forgetting about its former point of view from reality. The notion of the agreement of these two points of view brings meaning to the name Parallax, *"An effect by which the position of an object seems to change when is looked at from different positions"* - Cambridge Dictionary-

For the technical aspect, various components on the DBL -Performance Platform Lab- have to be set up: One computer runs "Captury Live", a tracking system software that is connected to 10 cameras that track the user's position on the space. Such data is sent to a second computer through an OSC protocol, this second computer is running simultaneously, Unity 3D, the software used to create the VR space and the one that allows the connection to the HTC VIVE system (headset and tracking sensors).

The connection between the two computers is necessary as the user will see itself in real time inside the rendered space, the Dasein model will be placed exactly onto its very own body, therefore the user's moves and position will trigger the animation of the Dasein model accordingly.

Here the notion of being perceived by the Other takes protagonism, the perception that the users receive about their own body doesn't come from themselves, it comes in a centripetal way, from the tracking system to the users, that Other is the one that tells the users where they are and ultimately where they exist, throughout data.

As soon as the user enters the VR space, it sees itself mapped onto its own body, soon it realizes there is another body wandering around the same room, the dancing man, a body that is an independent entity but one that tries to confront the user, a representation of the others, the people that we are surrounded by on our daily lives. In the same room, one wall is a mirror, where the user can properly see and understand that it has a body, in the opposed wall, there is a white circle, a portal. Mark Fisher on his latest book "The Weird and the Eerie" discusses that *"the centrality of the doors, thresholds, and portals means that the notion of the between is crucial in the weird"*.

And that is why this portal is there, as a threshold to the Albedo stage. On the other side of the portal, the user will find its *doppelgänger*, the body of the user will not be mapped on top of its real body anymore, it will be decentralized. The point of view of the Dasein has been disjointed. Now the Dasein sees itself as an autoscopy, its movements are mimicked, but not as it happens in a mirror, if the user tries to chase its *doppelgänger* it will run away, but if the user is the one that runs away the *doppelgänger* will follow it, the axis are inverted. Its a confrontation of the Dasein with its own image, the one that is perceived by the Other, an image that from time to time glitches and stops imitating the Dasein, a body without identity thus the absence of a head.

The users not only wears the VR headset as an input device, but an Arduino also plays an important role as it both receives and sends data to the computer. The Arduino is connected to the second computer inside the Unity 3D. In the first instance, an asset called Ardunity is installed on Unity, such asset renders possible a communication between the Arduino and Unity as it gives the possibility to export compatible codes from the Arduino IDE to C-Sharp (the programming language of Unity). After exporting multiple codes, the job was to condense them into one and create a single sketch that would activate three main pins on the microcontroller: Photoresistor, Potentiometer, and Buzzer. The first two acting as inputs and the third one as the output of the built system.

After uploading such codes to the Arduino, different controllers were attached to their pertinent prefabs. The Photoresistor controls the light of the environment, the Potentiometer tilts the whole space to a certain degree and the Buzzer emits different tonalities when the user, in the VR space, collides with its *doppelgänger* and the dancing man. Lastly, an HC-05 Bluetooth module was adjoined to the Arduino, in order to make possible a wireless interaction.

By interacting with the Arduino, the user or Dasein finds that the data of the hyperreal space is controllable, between the sending and receiving of data the user has the power to create glitches and control its surrounding space. By manipulating with its own hands the voltage on an apparatus such as an Arduino, a real energy can travel from reality to virtual reality, in a sense a high or low of voltage becomes a glitch inside hyperreality, controlled by the Dasein.

The last stage, the Rubedo, is not depicted in the VR work, it is a conclusion that is up to each user that has gone through the process of the two first alchemical stages. After stripping the Dasein's skin, each user might find its own Parallax view, a glimpse of authenticity and an ecstasy of being uncanny in the world.

DEVICES

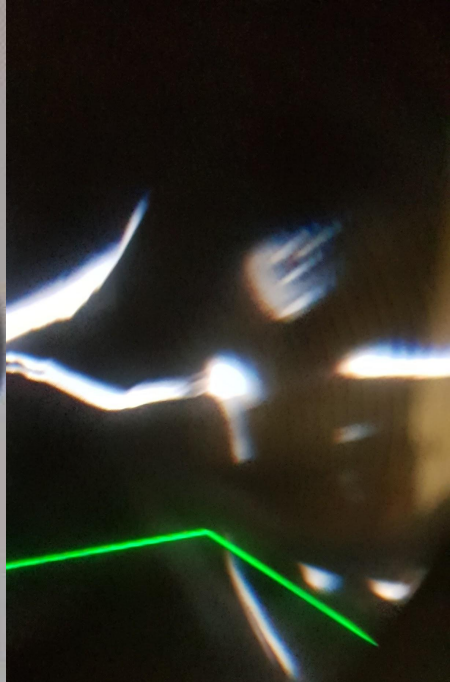


VIRTUAL REALITY SYSTEM



OSC
CONNECTION

TRACKING SYSTEM



Parallax Project - POVs

POVs
Parallax
Project



Click image
to open
video

<https://youtu.be/fjwcHRv1YqQ>

Different videos shot directly from the VR headset, it shows some of the first attempts of the VR experience and former designs of the space and its characters.

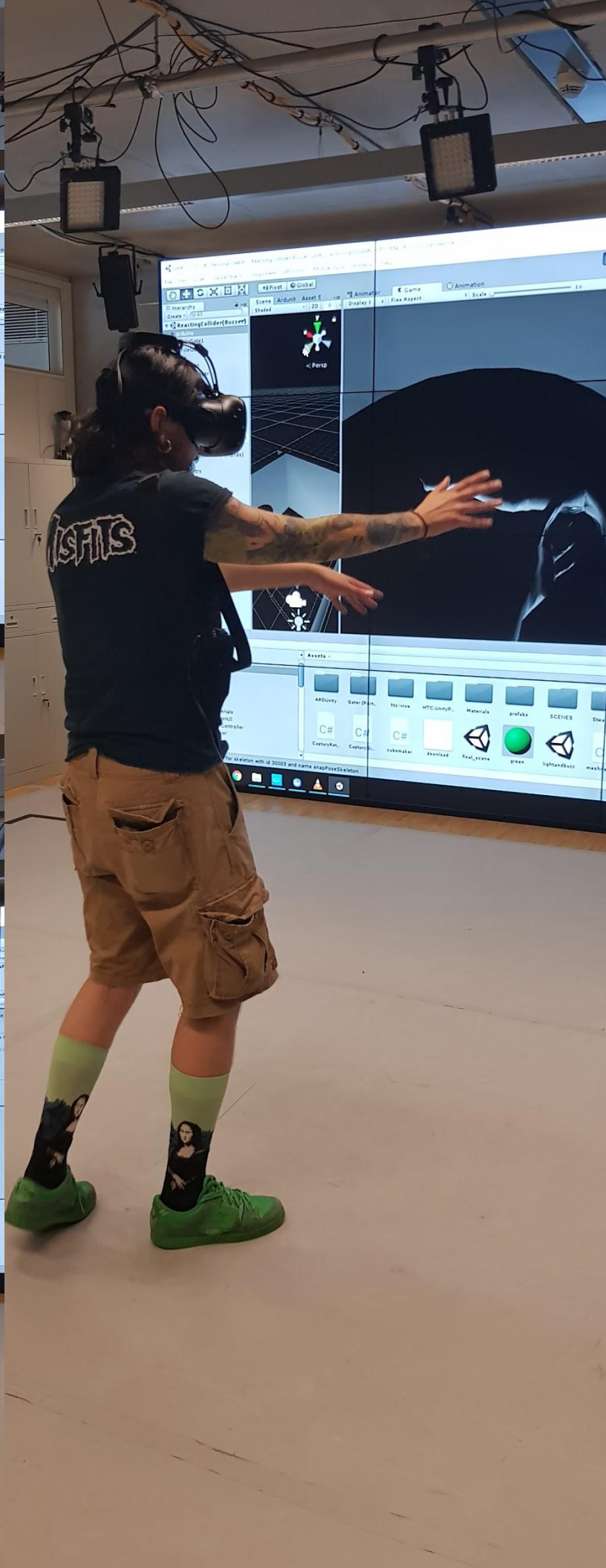
Parallax Project - Before Arduino



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to open
video

<https://youtu.be/X0i5bl0bW8Y>

Various tests of the VR experience before the implementation of Arduino.



Parallax Project - Video Compilation



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to open
video

<https://youtu.be/UBJf7DWQGF4>

Compilation of videos of different users experimenting with the space prior to the Arduino implementation, on the screen it is possible to see what the user is perceiving.

Parallax Project - Summaery

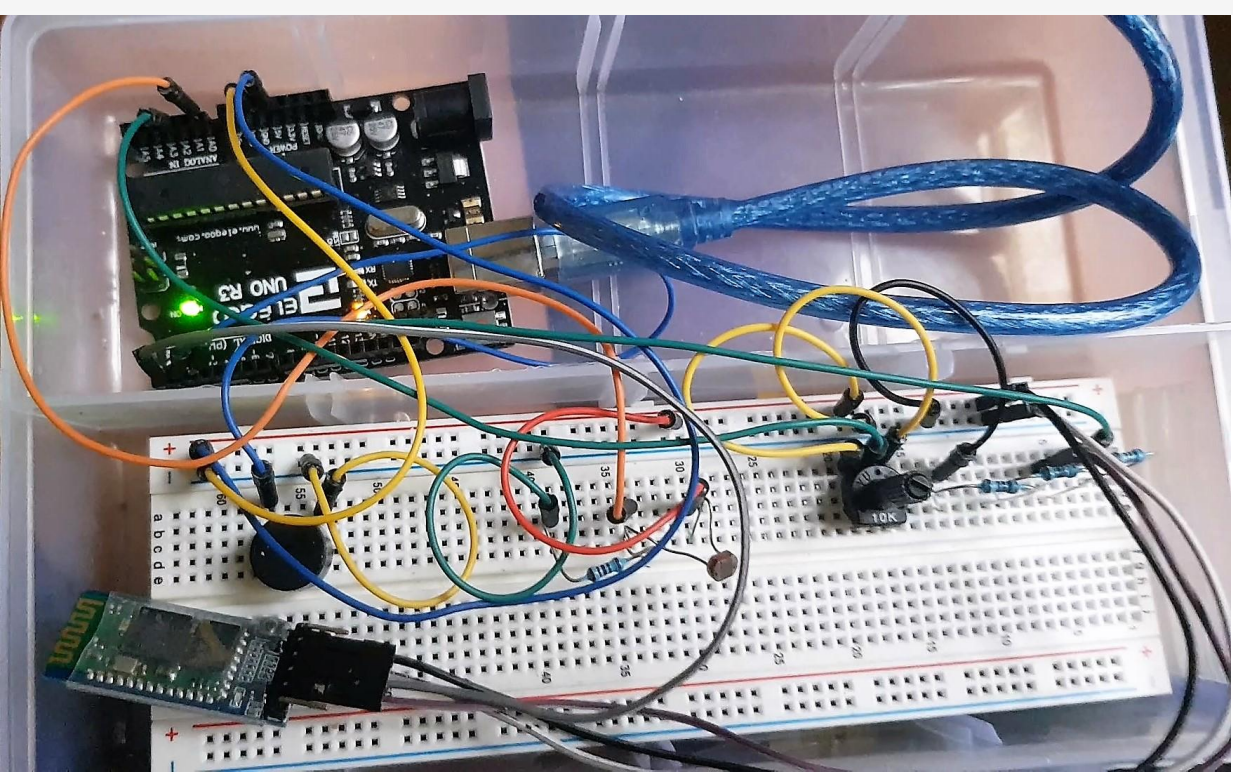
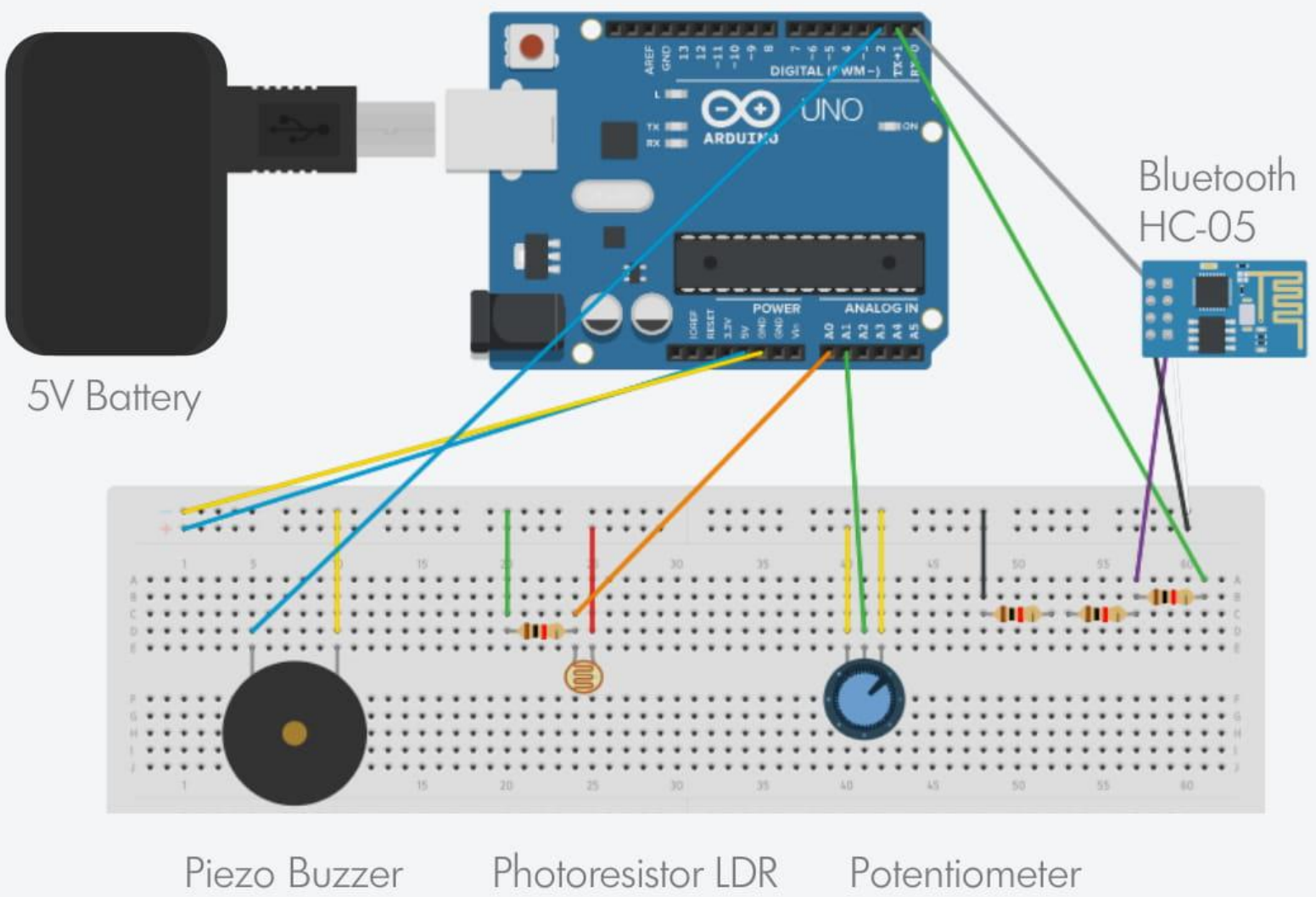


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video

<https://youtu.be/kVYJdSYchUU>

Experience of users during Summaery - This video shows the reaction of three users in the uncanny space. At this stage the VR space was designed differently, there was no second room, and the Arduino was not yet implemented.

Arduino Circuits and Components Parallax Project



The Buzzer goes to digital pin2, the Photoresistor to analog pin1 and the Potentiometer to analog pin2.

Notice the TX and RX connection with the Bluetooth module needs to be inverted, as this HC-05 allows a voltage of 3.3v while the Arduino works with 5v.

First Arduino-Unity communication

When the user interacts with the potentiometer and the photoresistor, objects on the scene rotate, and light intensity changes.

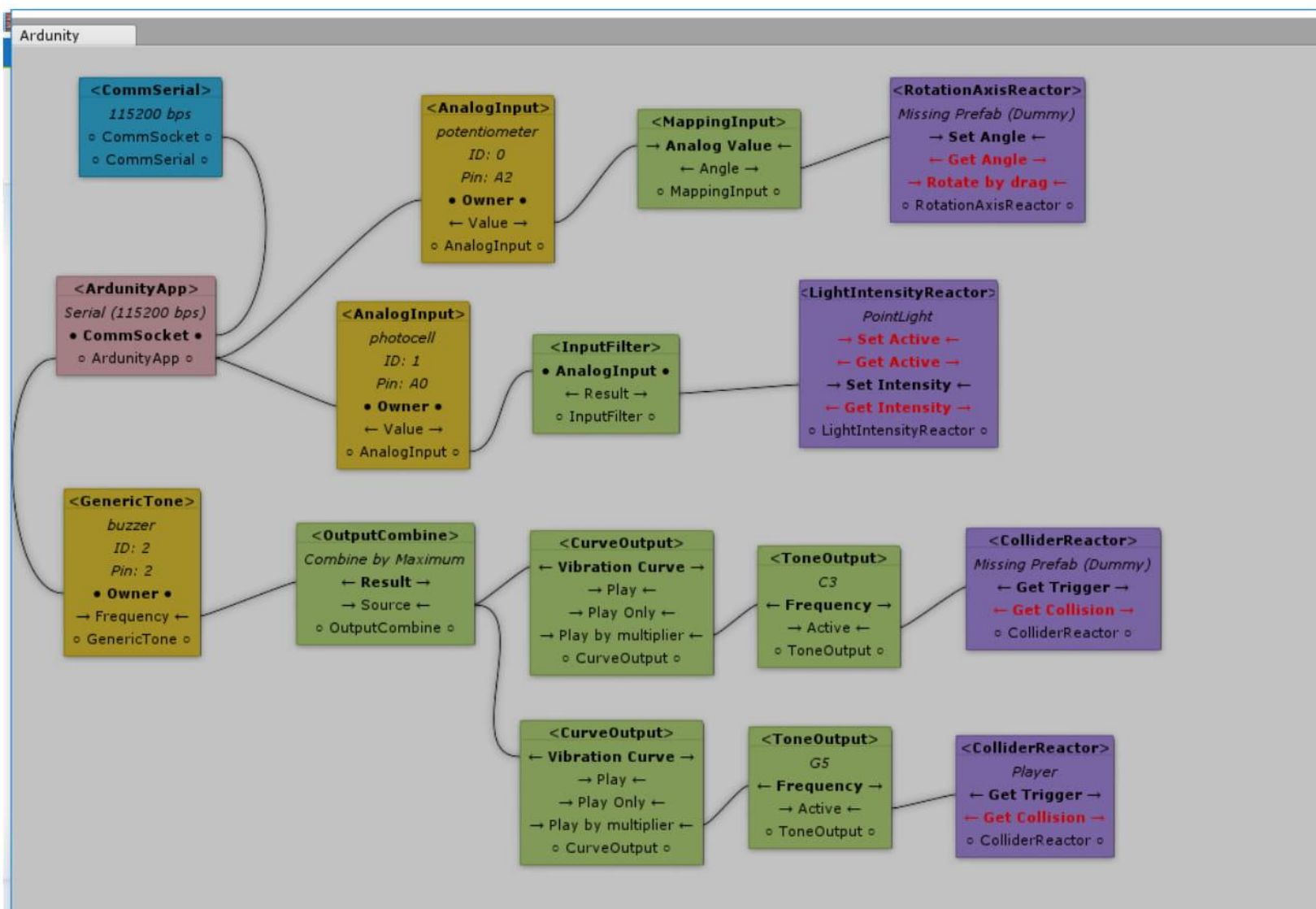


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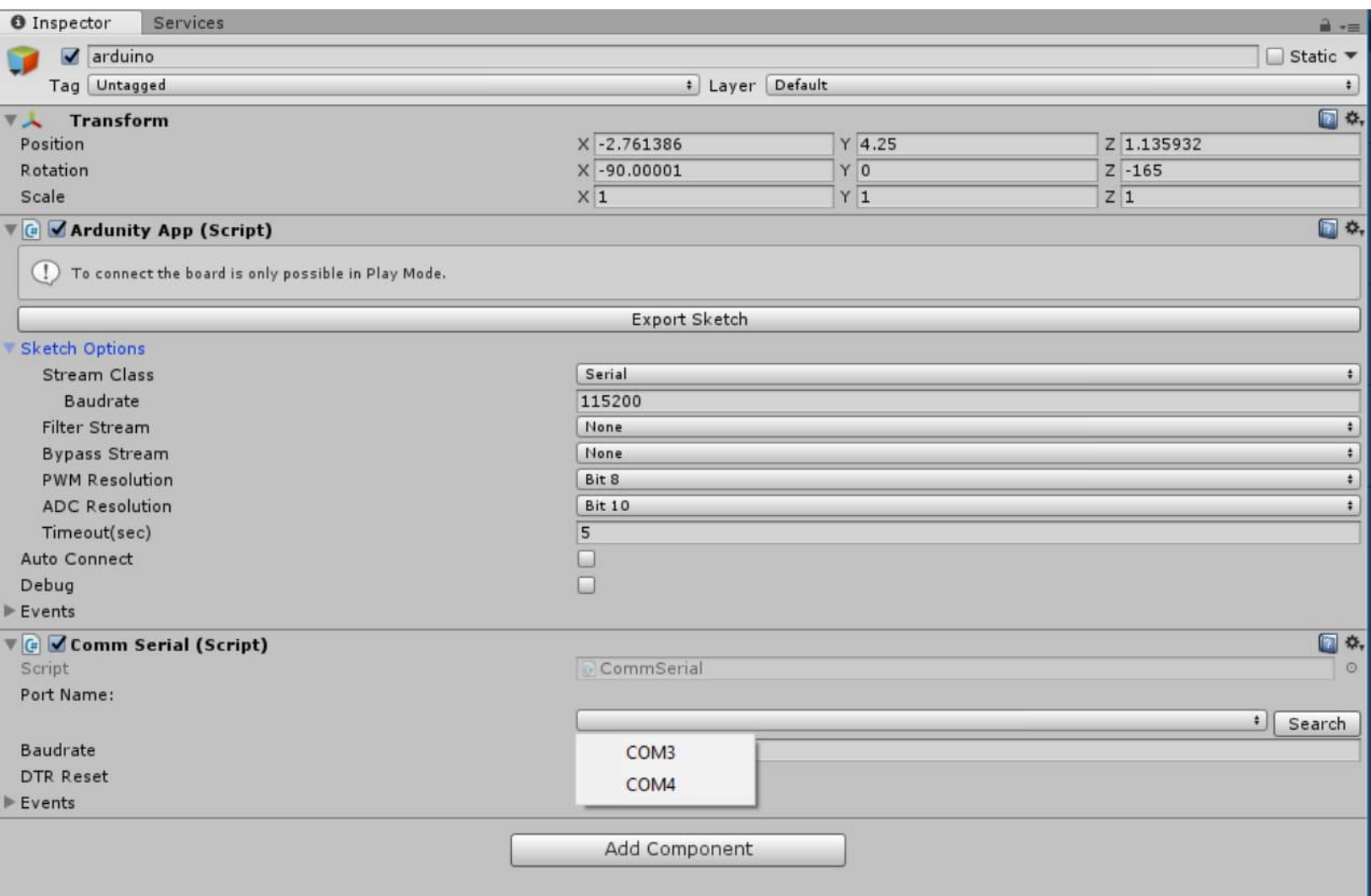
Quick look into one of the first attempts of communication between Arduino and Unity, the Buzzer is triggered by the collision of two bodies, and by manipulating the Potentiometer and the Photoresistor, objects on the space rotate and the light intensity of the VR space changes.

ARDUNITY - MAP OF CONNECTIONS, INPUTS, OUTPUTS AND PREFABS.



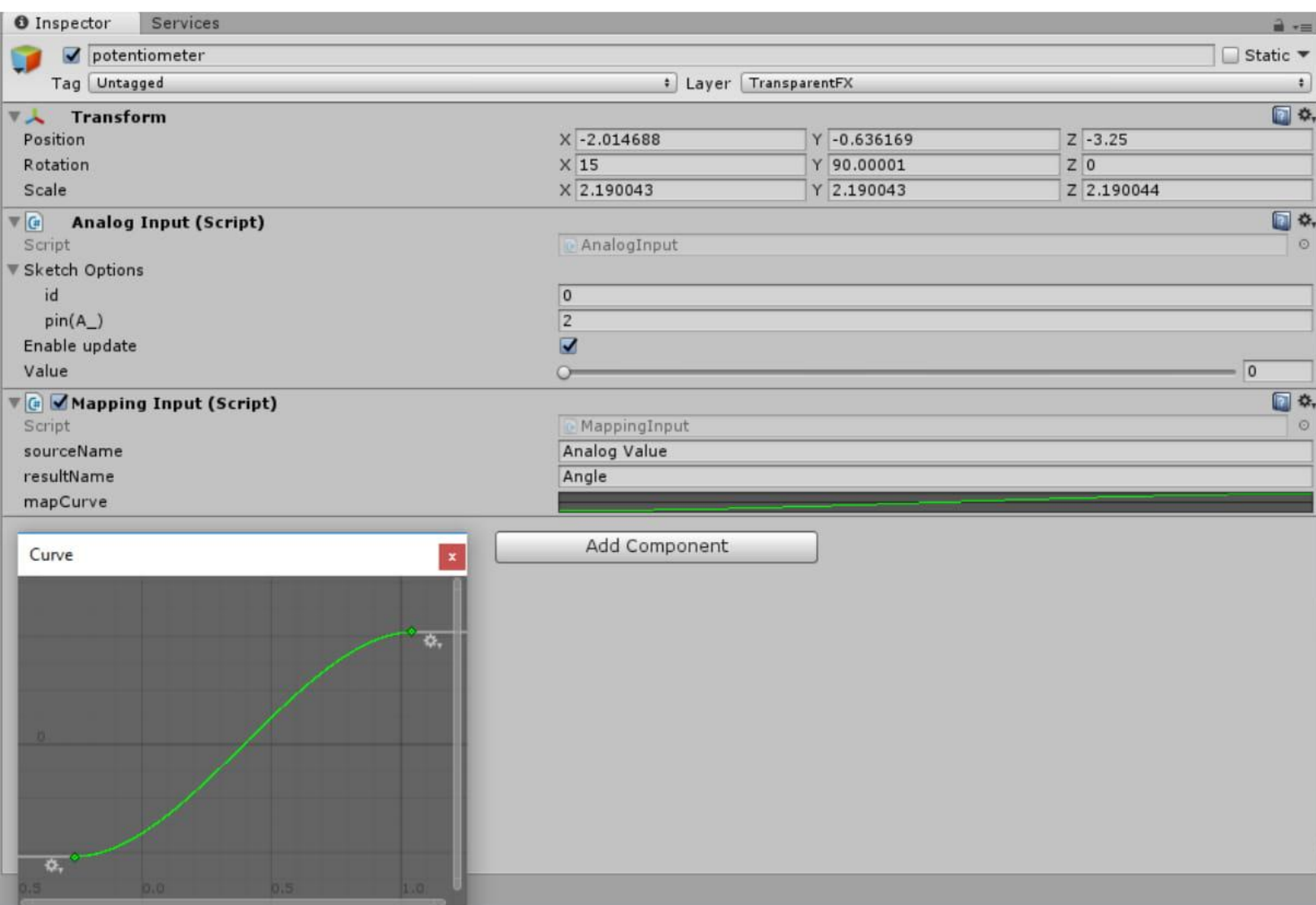
Map of the connection inside of Unity, with Ardunity. The blue and pink boxes responds to the connection protocol with the Arduino, the yellow ones set the pins and nature of input or output for the three different components, potentiometer, photoresistor and buzzer; the green ones give in general the characteristics such as curves, tones that will end up controlling the prefabs attached to them in purple boxes, space tilting, light intensity, doppelgänger collision sound,

CONNECTION COMPONENTS

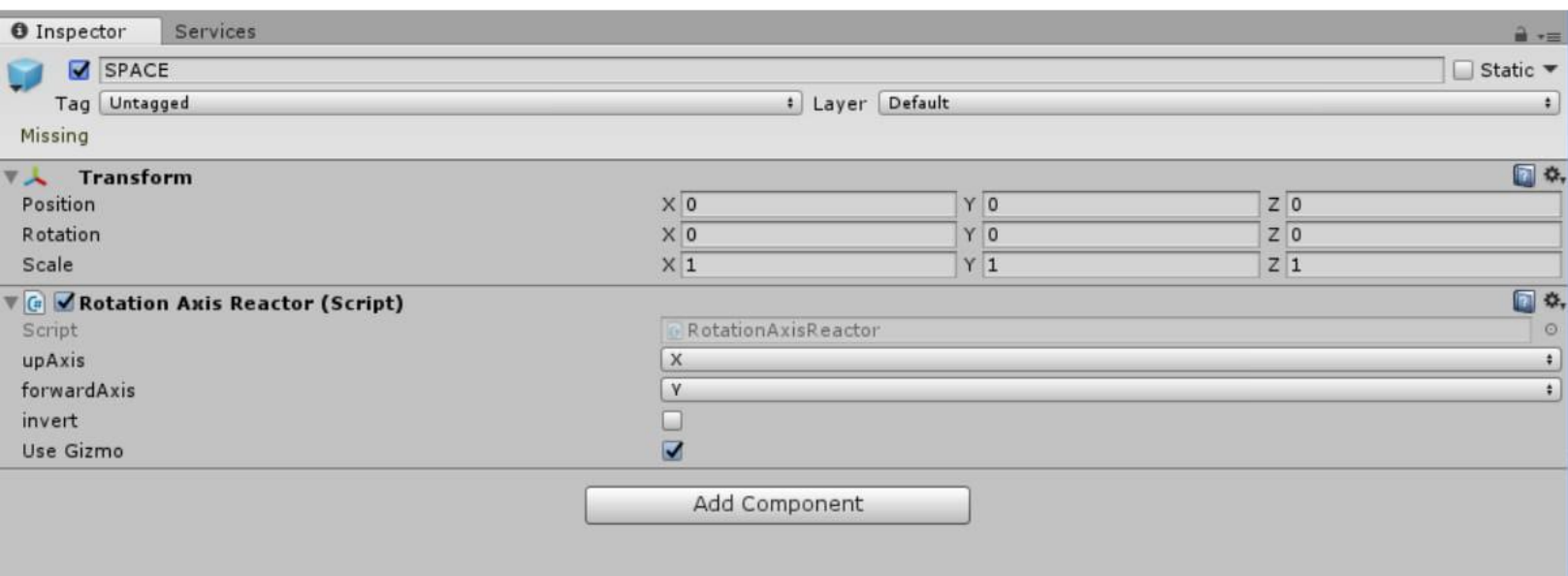


To finalize the connection on the Communication serial component the right “COM#” had to be chosen, to connect to the Arduino via Bluetooth. Ardunity works with a Baudrate of 115200, reason why the default configuration of the Bluetooth module had to be changed from 9600 to 115200.

POTENTIOMETER COMPONENTS

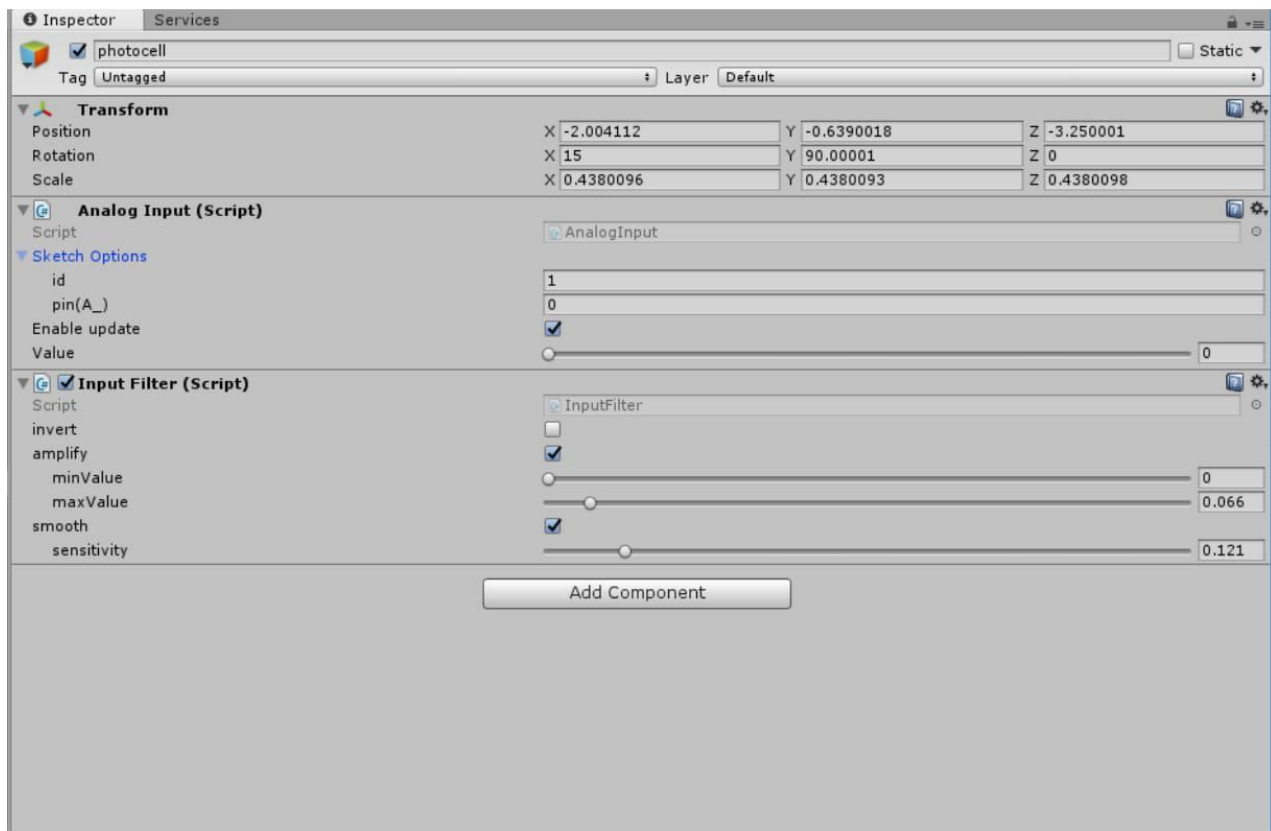


SPACE PREFAB CONNECTION TO ARDUNITY

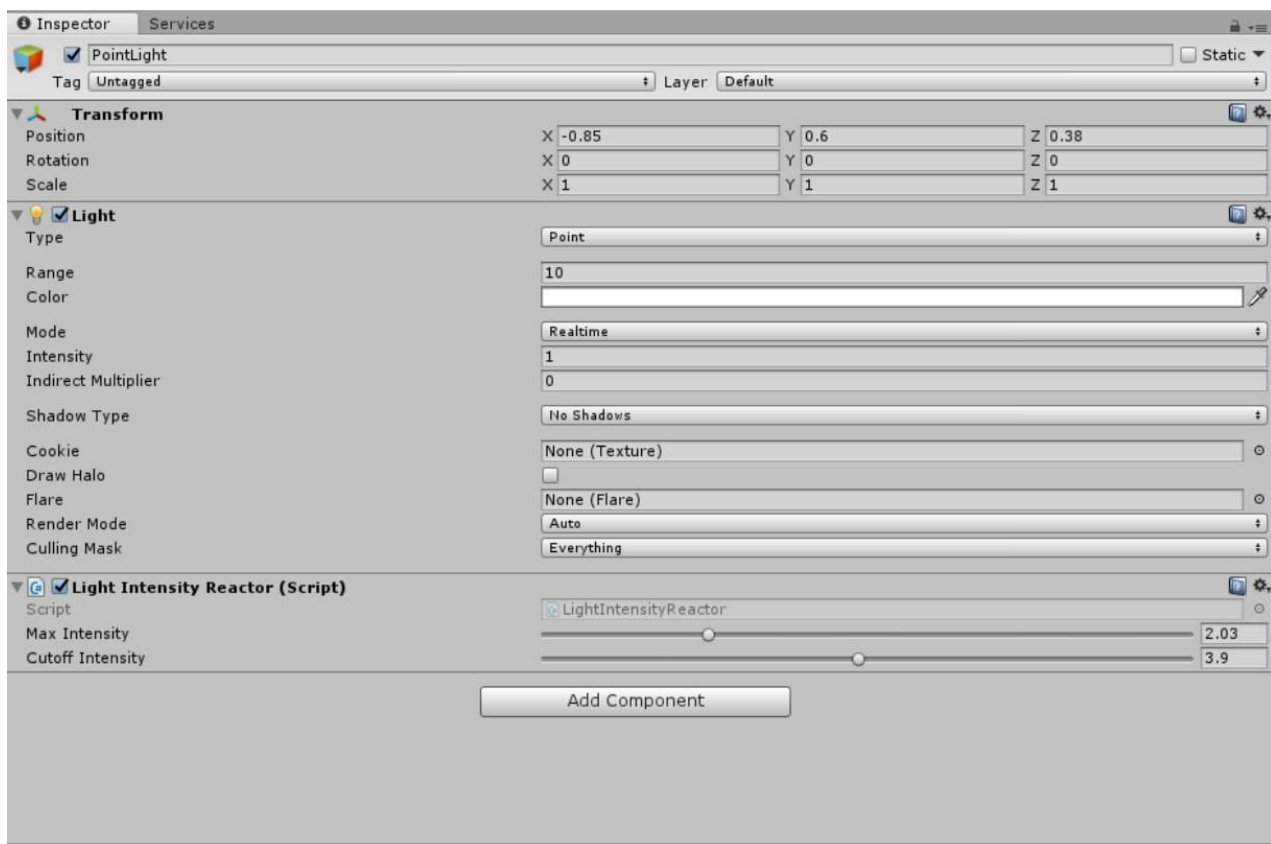


The potentiometer is connected to pin A2, and the analog value was mapped with the curves here depicted. The Space prefab is the one attached to the potentiometer with a Rotation axis reactor script, as a result when the potentiometer is turned the space changes angle accordingly.

PHOTORESISTOR COMPONENTS

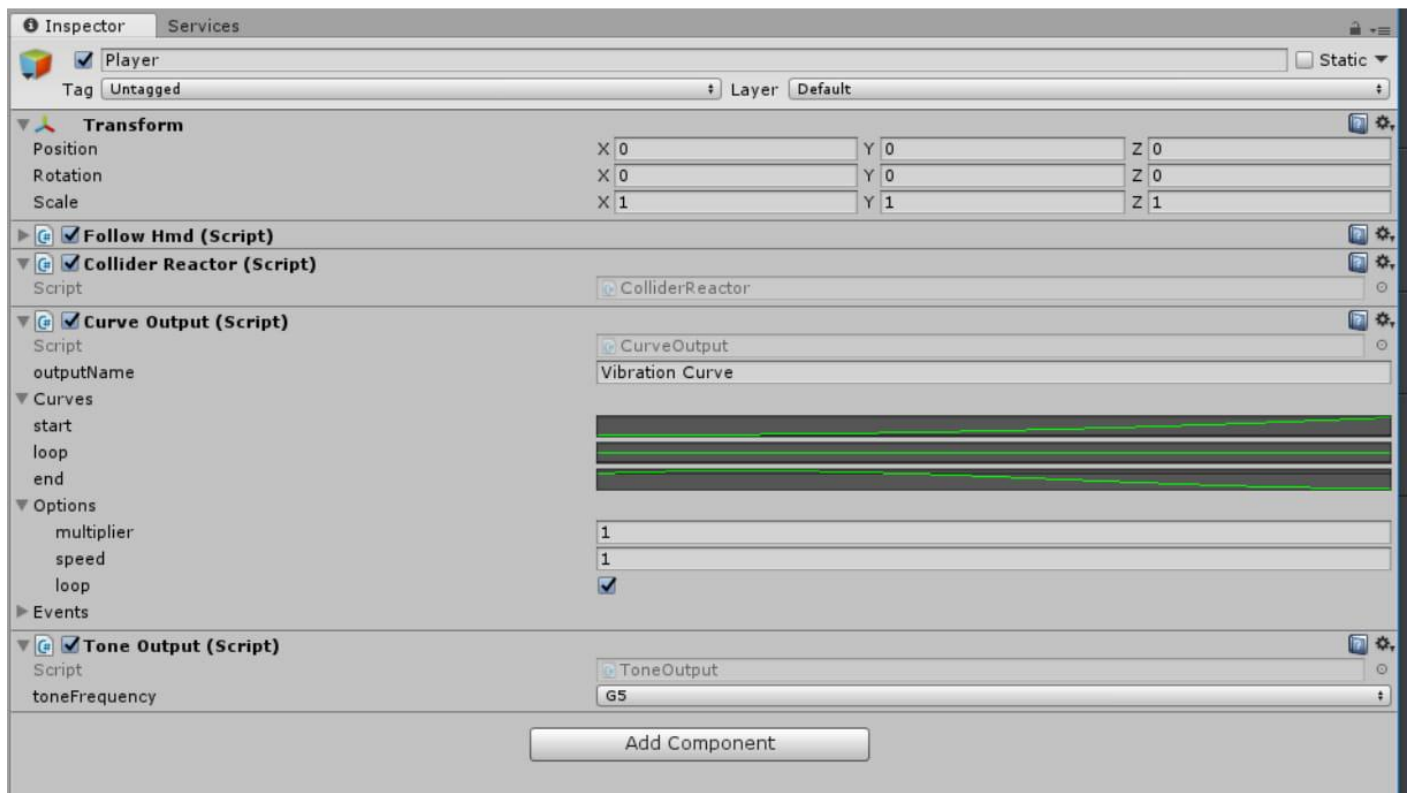
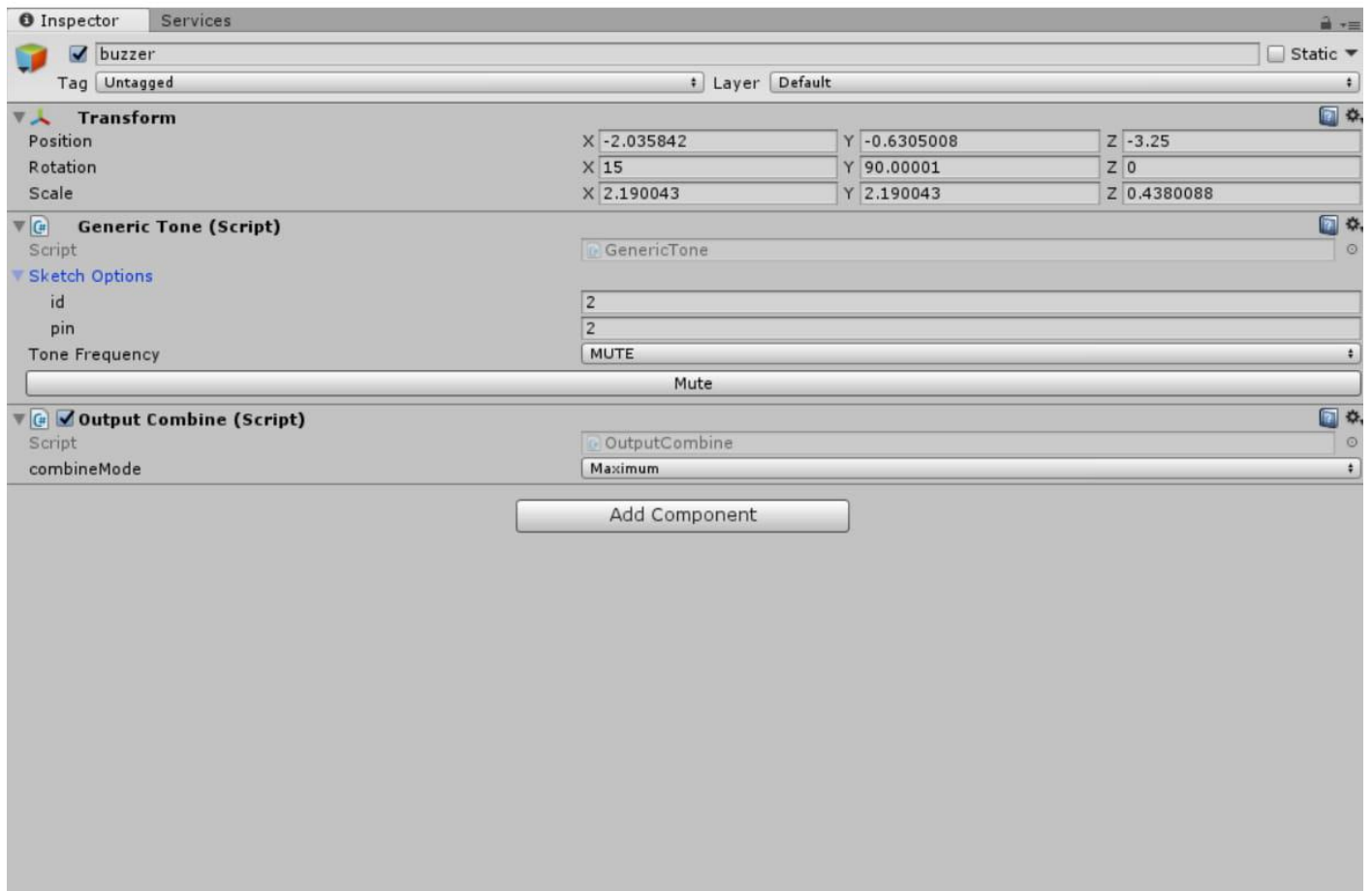


LIGHT CONNECTION TO ARDUNITY



The photoresistor is connected to pin A1, and the analog value was mapped with the slider and smoothed. The PointLight prefab is the one attached to the photoresistor with a Light intensity reactor script, as a result when the photoresistor is covered with the hand the light intensity of the VR space goes down.

PIEZO BUZZER COMPONENTS



The Piezo buzzer is connected to digital pin2, The player, thus the body that will collide with the doppelgänger and the dancing man needs to be attached to a Collider reactor script and a Tone Output, the tone for in case is G5, curves can be mapped to control the length of the sound of the buzzer

Parallax Project - Dasein I



Click image
to open
video

<https://youtu.be/6xMfvF92DL8>

Final Documentation of the project. - Video with first user- The first part shows the user in the Performance Platform, its interaction with the Arduino (turn on sound to hear the buzzer) and the process of tracking. The second part in its beginning shows the connection process to the Arduino inside of Unity, after that is visible what the user is seeing inside the rendered space

Parallax Project - Dasein II



Click image
to open
video

<https://youtu.be/Rt0OSb6O6Lo>

Final Documentation of the project. - Video with second user- The first part shows the user in the Performance Platform interacting with the Arduino (turn on sound to hear the buzzer). The second part in its beginning shows the connection process to the Arduino inside of Unity, after that is visible what the user is seeing inside the rendered space