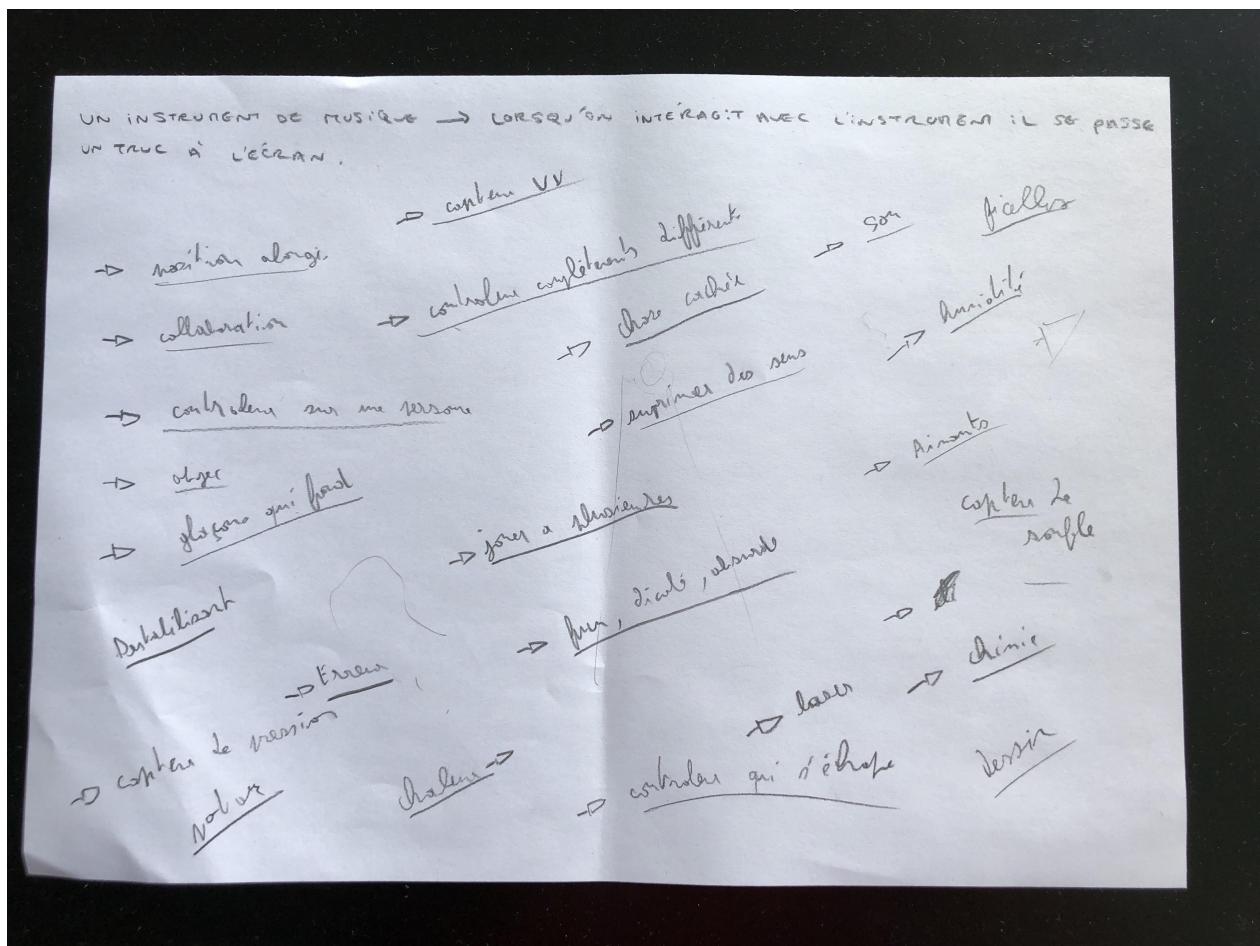


Documentation's book

Brief : Product a game in a team composed of five students using an arduino card type Uno.

The beginning of the project

Once we understood the brief, we started to **think jointly**, and thus **writing on paper every things and notions** that we wanted to convey in our game.



We started to write every ideas.

The notions that emerged in this exchange are the notions of **opposition and synergy**, **controller on a player, multiplayer game** and the idea of **removing a sense**.

We had the ambition to **propose a gameplay never seen before**, innovating, ensuring that **the player uses his body in the space to evolve in the game** that we created.

Removal of a sense

The idea of depriving a sense rapidly took place in the heart of our project. We thought about the senses that we would like to nullify and we arrived at the conclusion that **we should remove the sight and the hearing.**



Blind boy : pattayaone.news

We thought that we could **make a multiplayer game** in which we'd have **one player who will be blind and an other who will be deaf.**

The deaf boss and the blind warrior

Then, we decided to write on paper again the ideas of games that we had, using the themes that we evoked before. We had a lot of ideas : we thought about an **intrusion game** in which we have to steal something in groups of two without waking someone and **using the sound recognasation**. We thought about a game in which the player **had to fight zombies** and one player would be blind and the other deaf, or an **escape game**.

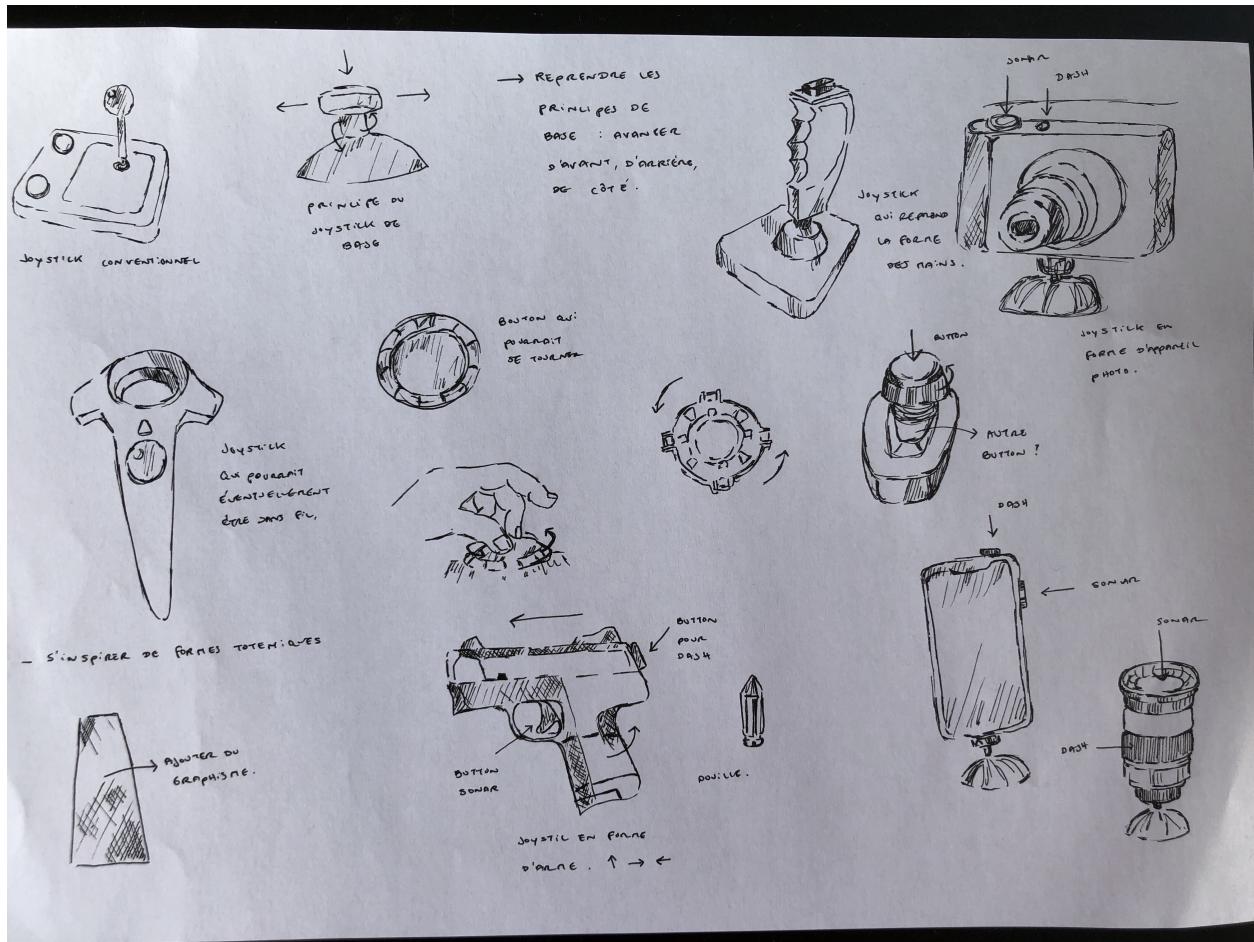
But the idea that interested us the most is the idea of "**hide-and-seek**" : the blind player would have to find the deaf player **using sound design** like collisions when the deaf player is bumping in a wall, or heartbeats.

Material

For this project, we listed all the material we need.

- Arduino card Uno.
- Bread board
- Pressure sensor
- Rotaty potentiometer
- Videoprojector
- Computer
- Chair
- Mobile phone
- 1 Button
- Wires

We decided to ensure ourselves that **the joystick could be something figurative** so, after defining the universe and the story of the game, we thought that the joystick could be a camera.



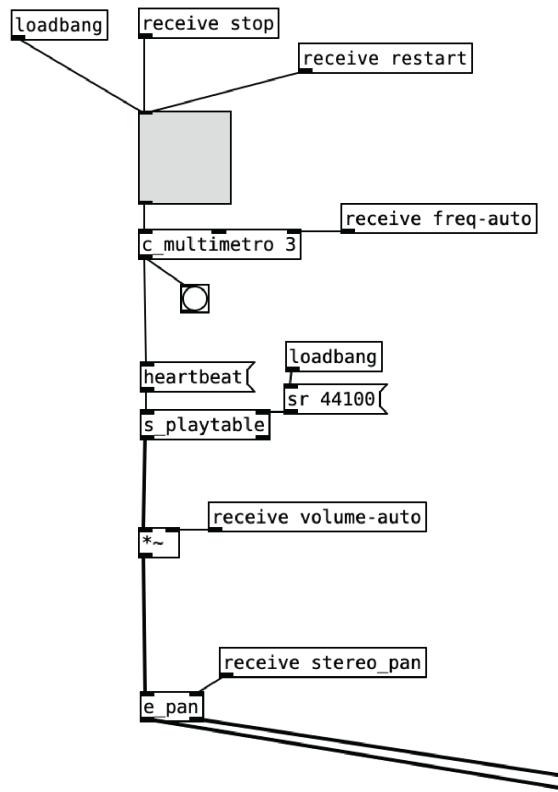
We started by doing research around the joystick and then thought about which type of joystick we could make in our game.

Hide-and-seek

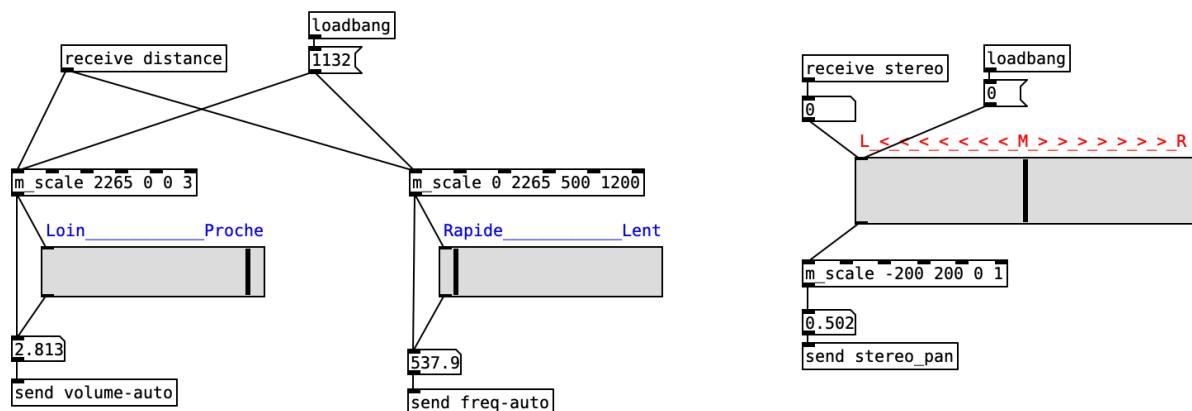
To evolve in our game, we decided that **the player have to use his body to move**. We used **the compass** and **the rotation** of a **smartphone** to **map the position of the player depending of the North, South, East and West**. With **Processing**, we start to experiment.

The chaser use this fonction. He's blind and we decided that **he moves in the game when he rotates a smartphone** to change his cardinal direction.

We also **added sound design**. The chaser hear sounds that we generate with **Pure Data** to find the chased. **Background sounds** like heartbeats, or storms have been added. **The sound is spacialized with stereo** to help the chaser to found the chased. When he is on the left, the heartbeats or any other events will be heard by the chaser on his left ear.

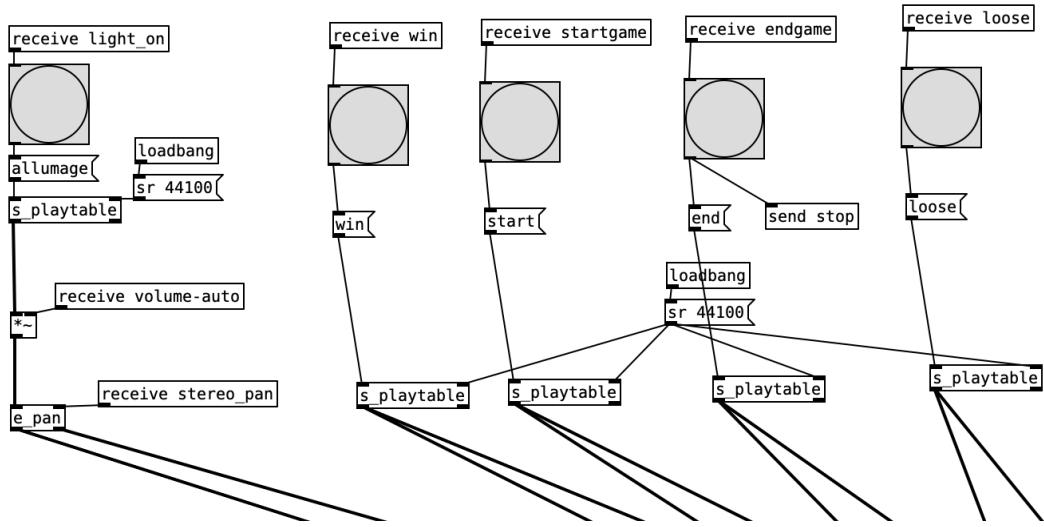


Sketch Pure Data that allows us to have the sound of the heartbeats.



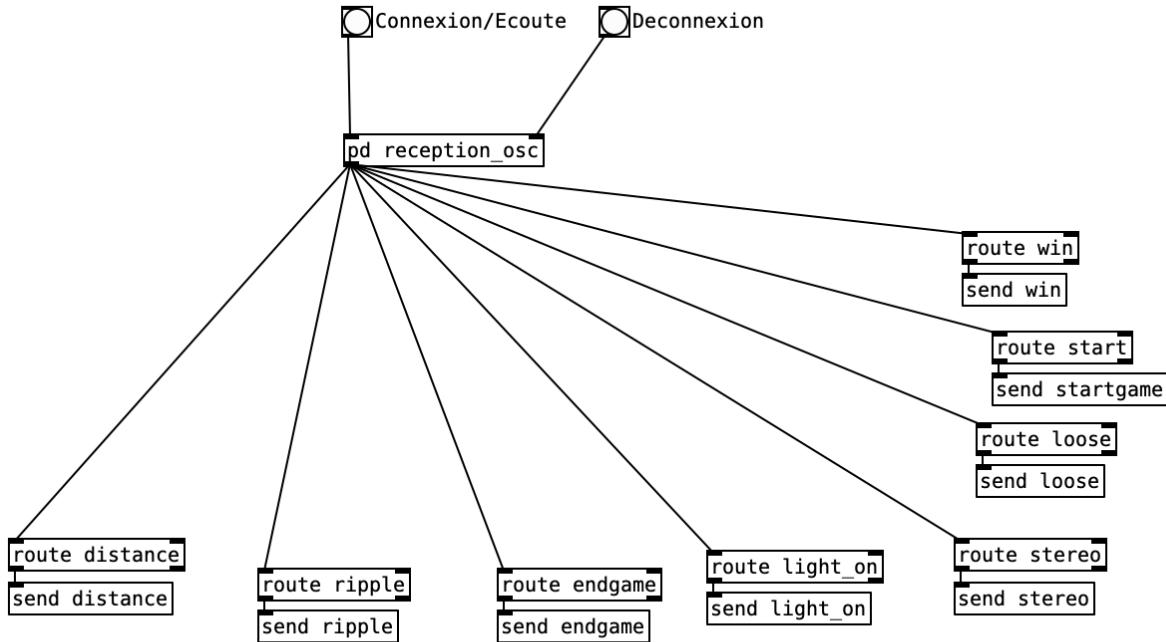
The general controller

We made a general controller to **visualize all the data from Processing to incorporate them to Pure Data**.



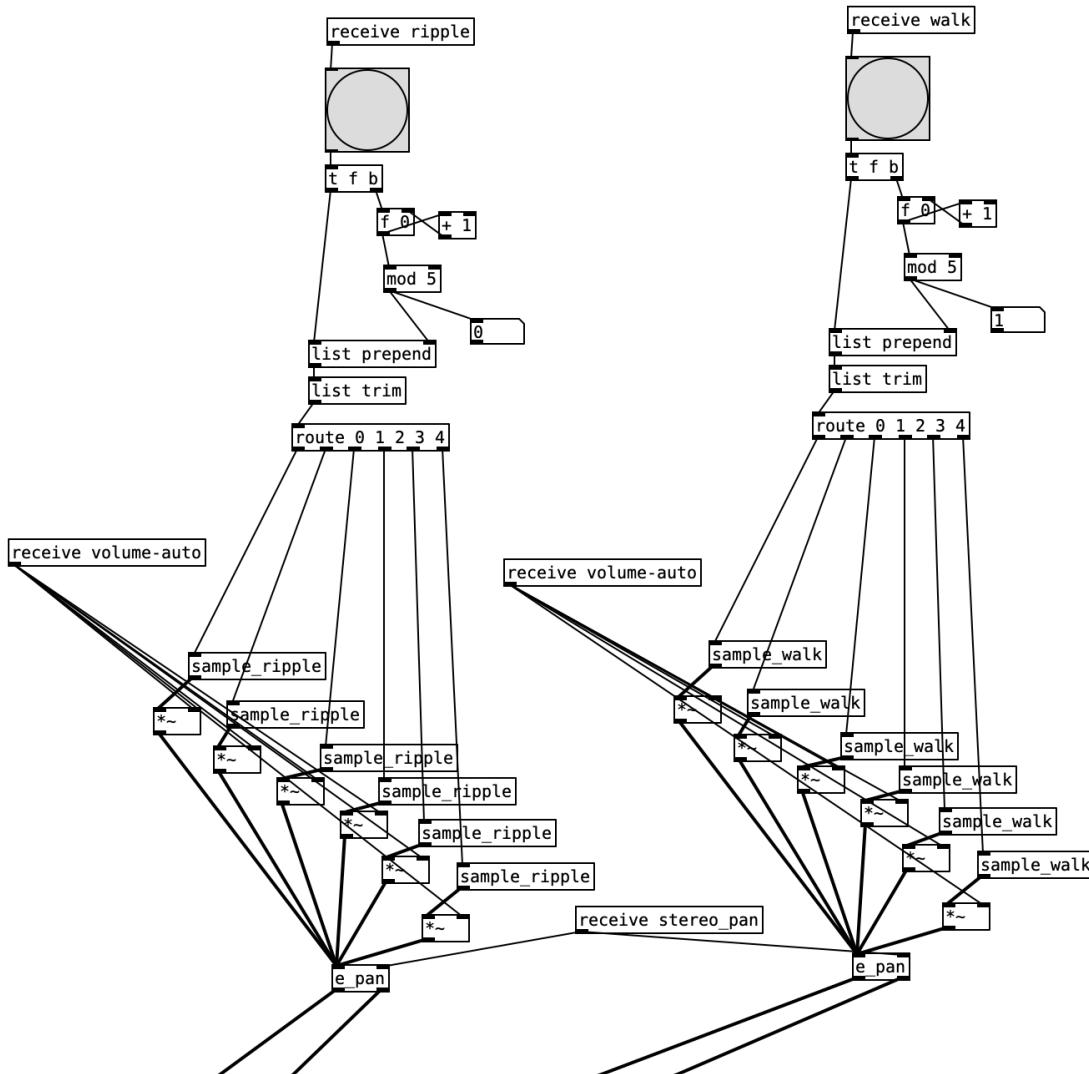
The events in Pure Data

Then, **we created all the events**. When Processing receive the information that the player won, **the event "receive win" will play a sample**.



Recover events from Processing

Thereby, we **recovered events from Processing** and it allows us to **link the events from Processing and Pure Data together**.

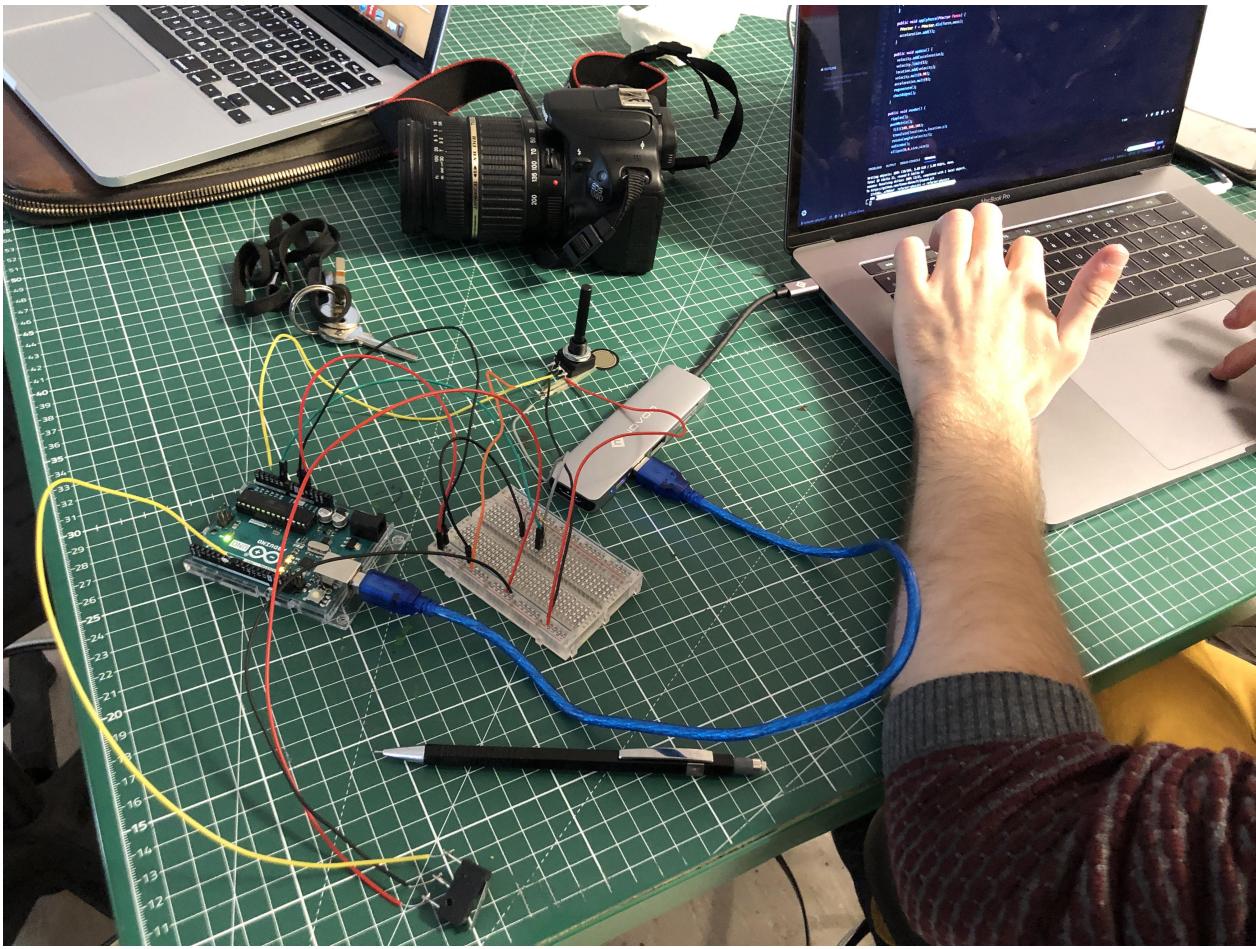


Sounds of the sonar and the footsteps

Finally, we created trees to **have the sounds of the sonar and the footsteps**. Rapidly we had to found a solution to **superimpose the sounds** and to ensure that **every sound can be played everytime and at the same time without being stopped by an other**. That's why we entered a value that allows us to make sounds in **polyphony**.

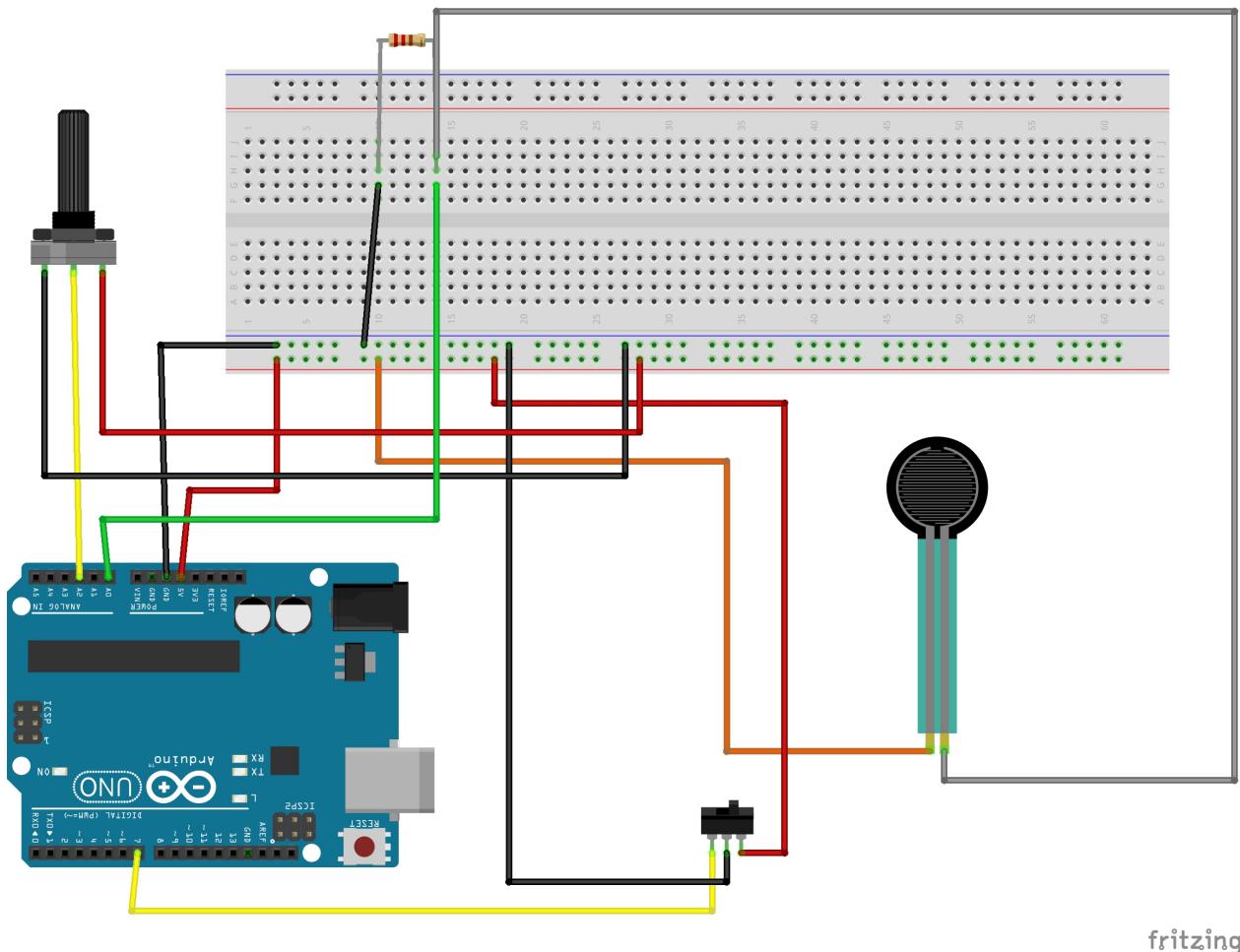
The chased is deaf. He evolves in the game with **a revisited joystick**. He doesn't hear the sound that he makes and he's not be able to see the chaser without **using a sonar**. He can **manage the range of the sonar depending on the strength he puts on the button**. The more pressure he applies, the further he sees, but it makes him louder.

Installation



We connected our Arduino installation with Processing and Arduino.

We use a lot of tools in our project. We started to connect a **rotary potentiometer** with an **Arduino card Uno** and a **breadboard**.



Our Arduino installation

The **rotation potentiometer** allowed us to **handle the rotation** and it allows the chased to have **more fluency in his moves** in the game. It is more precise than just buttons because he can **orientate himself at any value from 0 to 360 degrees** and we thought that it could **bring a better player experience** coupled to a single button to move forward.

We also used a **pressure sensor** because since the chased player uses a sonar to found the chaser, this tool can **control the pressure applied to it** and ensure that the stronger the player press the sensor and the bigger the sonar's ripple will be.

We also decided that the chaser plays with his body. That's why we decided to **use an OSC connection with a smartphone to use the compass and have data about the position of the phone in space**, permitting us to control the chaser in the Processing sketch.



Projector for the game

We decided that we would project our game using **a video projector** to have **a better immersion** in our universe. We also **worked on the scenography** : we want to ensure that **the player think that he is in a forest** so we brought elements like fake trees.

User feedback

After some user testing we balanced the gameplay by slowing down the chased and adding one more generator to activate before he can find the exit. Most people enjoyed the experience and the overall feedback was excellent but we also reported some issues :

- Some users tend to use the controller of the chased as a joystick.
- The built quality of the prototype of the chased controller was

Sources

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Film : **Alien, The Eighth Passenger** by Ridley Scott, released on September 12th 1979.

Video Game : **Checkers** developed by APh Technological Consulting for the plateforme Intellivision.

Video Game : **Donkey Kong**, released on July 9 1981 for Nintendo.

Video Game : **Sub Hunt** developed by APh Technological Consulting for the plateforme Intellivision.

Video Game : **Lurking** multiplayer game, released on November 18 2015 for PC.

Video Game : **Super Hot** developed by SuperHot Team, released on February 25 2016 for PC.