HEROrchestra

Cloud Valley Team
Creative Learning Design
Summer 2018, NYU Shanghai

HEROrchestra is an interactive musical experience that engages gaming and musical learning through the incorporation of representative characters(heroes).

Goals

- Musical learning
  - different kinds and cultures of musical instruments
  - musical notes
- Self-empowerment
  - Relating oneself to the heroes/characters playing music
  - Gaining self-esteem by being able to play music without any musical background needed
- Participation in educative activities
  - improvisations and “jamming”
  - More interested in learning music

Persona: Angela from Cloud Valley

Angela is in 1st grade. She doesn't really like going to school because it means she'll be away from her parents, but once she sees her friends in music class, she feels better. She is not very skilled in playing an instrument but would love to play one well!

Angela is still learning to be independent and is shy in new situations, but she feels more at ease when she has her friends nearby. She likes to paint with her friends and play make-believe stories.

- **Attraction:** most children love the idea of imagining themselves with superpowers!
- **Engagement:** Angela will understand and use her superpowers and jam with her friends. She will be able to hold made instrument that is similar to a real one.
- **Conclusion:** Angela will be able to feel empowered by reimagining herself as a superhero, have the opportunity to interact with music in unique ways, and learn about the power of teamwork!

Persona: Bob from Cloud Valley

Bob is in 7th grade. He is highly proactive but also very knowledgeable. He understands coding and has some musical knowledge. He is curious and focused on what he is doing it and how it works. He is very knowledgeable, thus he wants higher degree of challenges. He is ready for any challenges but is also open to give direct feedback to the designer.

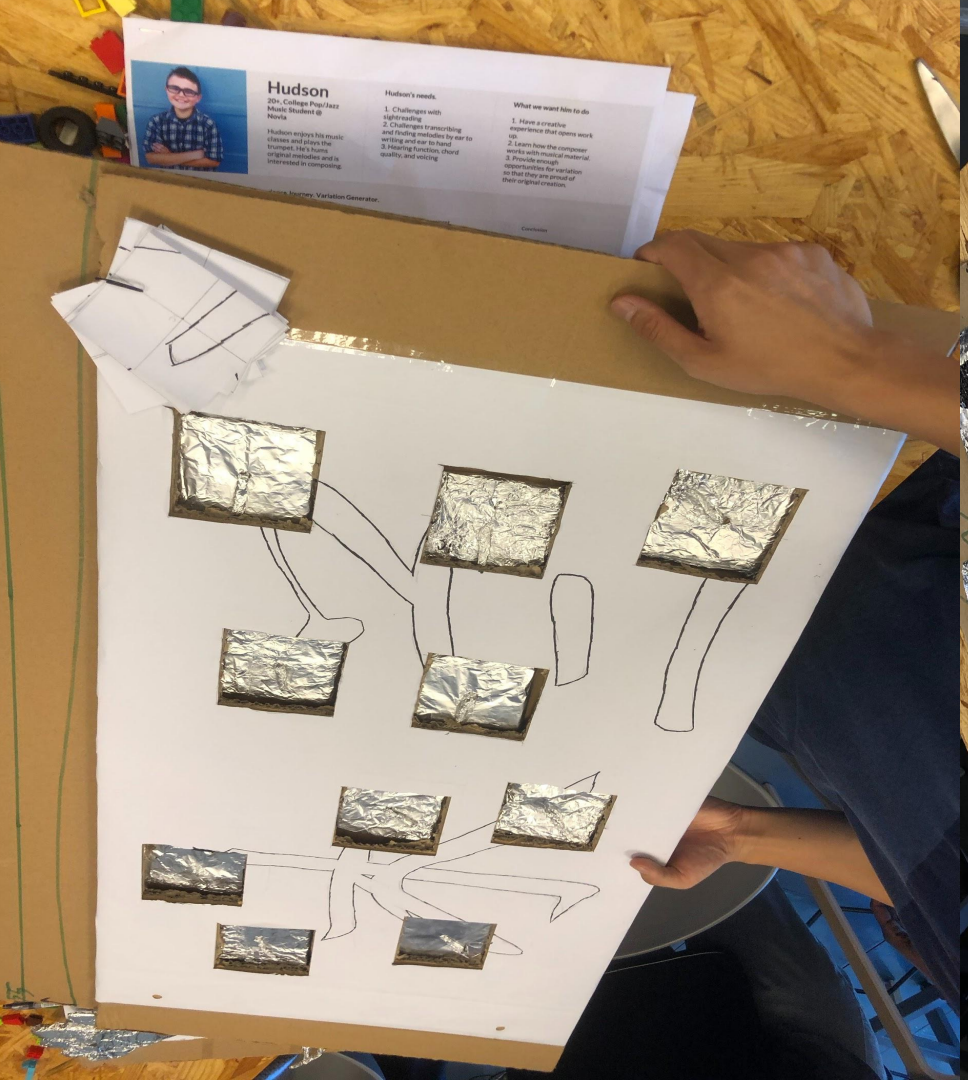
- **Attraction:** 7th graders are empowered to be challenged and learn newer musical ideas.
- **Engagement:** Bob is not very skilled at playing an instrument, thus a simplified instrument will allow him to grasp musical learning very quickly. On the other hand, Bob is curious in what he is doing. Thus, revealing what he is playing is a vital part to musical learning for him. Bob can also interact music with others and find ways to “make music”!
- **Conclusion:** Bob is a quick learner and absorb information very quickly. Thus, the more we give him the better!

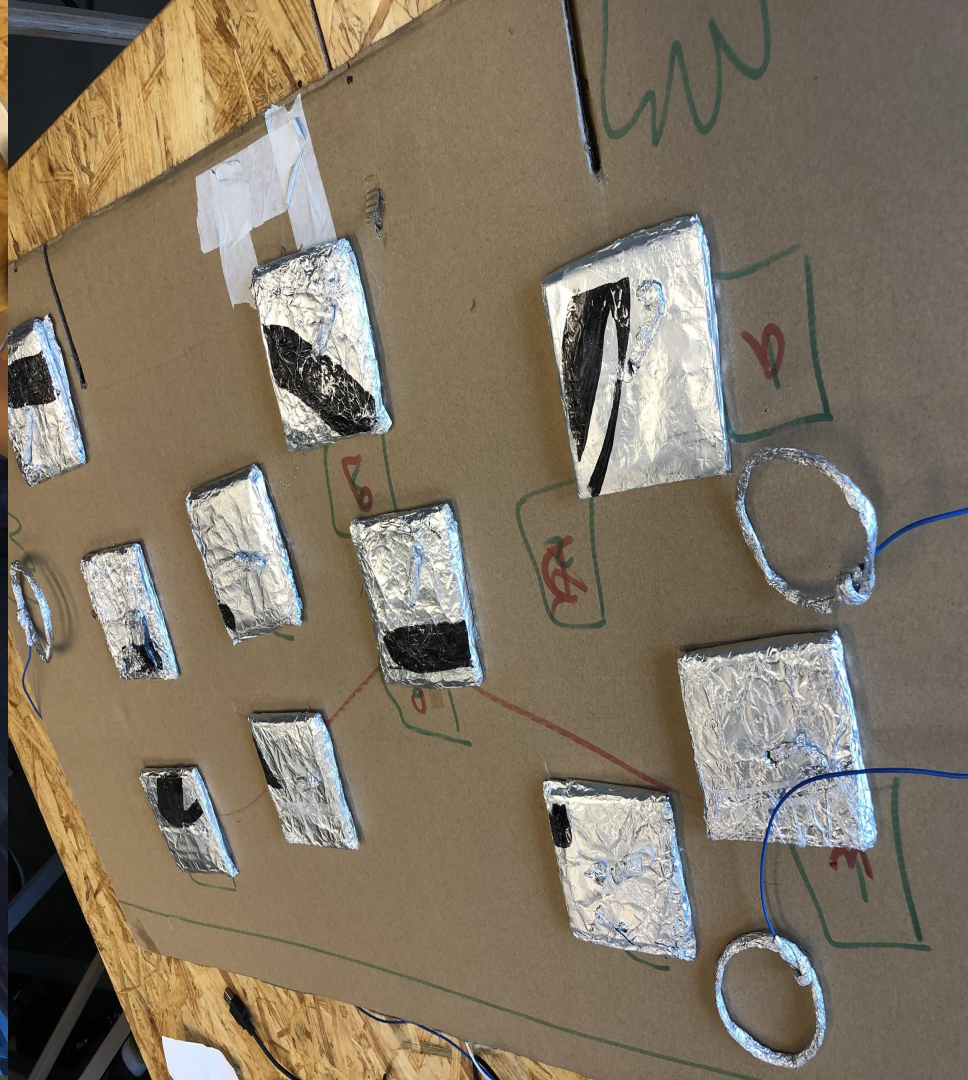
Technical Layout

Main methods of interaction: video sensors and touch sensors.
Materials: Scratch, Makey-makey, cardboard, foil, paper

- The master board(base) contains all the wires that connect to a laptop in order to receive input from the players. The students must first interact with the aluminium-foiled hands(***wrist-band***) in order to start input. The ***10 square blocks*** covered in foils are the access points that receive touch input to produce musical output.
- The 3 layouts (one for each hero) are placed directly over the base board depending on the hero that is currently in use. Each layout is ***visually distinct*** in order to help students better identify how each hero works. This will be further explained in the bottom section “Meet the Heroes”.
- One extra “Guitar”: Virtual ***strings(wires)*** are connected to ground, which forces the player to actually touch the “wires”. Strengthened backboard, still need a ruler.
- The screen (either the computer screen or a projected screen) is where the visual output will be shown. We are currently still in the process of finishing the visual output in Scratch. And the ***camera*** on top of the screen will serve as a motion sensor. The ***microphone*** is on to receive Volume input.

*Additionally, each hero will have a unique approach to interact with the system.


Hudson
20+, College Pop/Jazz
Music Student @
Novia
Hudson enjoys his music classes and plays the trumpet. He's hums original melodies and is interested in composing.
Hudson's needs.
1. Challenges with sightreading
2. Challenges transcribing and finding melodies by ear to writing and ear to hand
3. Hearing function, chord quality, and voicing
What we want him to do
1. Have a creative experience that opens work up.
2. Learn how the composer works with musical material.
3. Provide enough opportunities for variation so that they are proud of their original creation.
Variation Generator.
Conclusion



Storyline: 3 heroes

Mulan

- Concept: Traditional Chinese culture
- Musical theme: Traditional Chinese music
- Physical Layout: A chinese calligraphy of the characters “木兰” (“Mulan”) on the cardboard with blocks representing the five chinese musical notes
- Touch sensor: Touching the foiled blocks to
  - generate different Guzheng notes
  - generate the visuals on Scratch: lighting up the lanterns
- Visual Design: some hazy symbols

Conductor

- Musical theme: Classical and Western music.
- Layout: A conductor's score
- Touch sensor: Illustrated musical notes on the conductor's scores. The notes are E, F#, G#, B, C# (Emaj).
- Video sensor: Utilizes a <u>Baton</u> to change instrumentation (strings, woodwinds, trumpets, etc.) through waving in different sections.
- BGM: Butterfly Lovers' Violin Concerto
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- Clapping activates the System and BGM
- Difficulties: The size of the screen (better in a projector). Sensitivity of the Motion Sensor.
- Further improvements:
    - Cultural interface
    - Learning, education

The Rock Thunder (Rockstar)

- Loosely based on Thor from the Avenger
  - Weapon: electric guitar
  - Also has the power of flight
- Amuma (Lightning Guitar)
  - A cardboard-made guitar with sensors on it
  - Can be used to play different notes
  - Superpower: Shoots lightning bolts
- Drum Sets (on the board)
  - Superpower: energy blast
- Musical theme: Rock music
- Layout: A band’s drum set (one on each side)
- Touch sensor: Illustrated drum sets

Creative Process

Prototype I

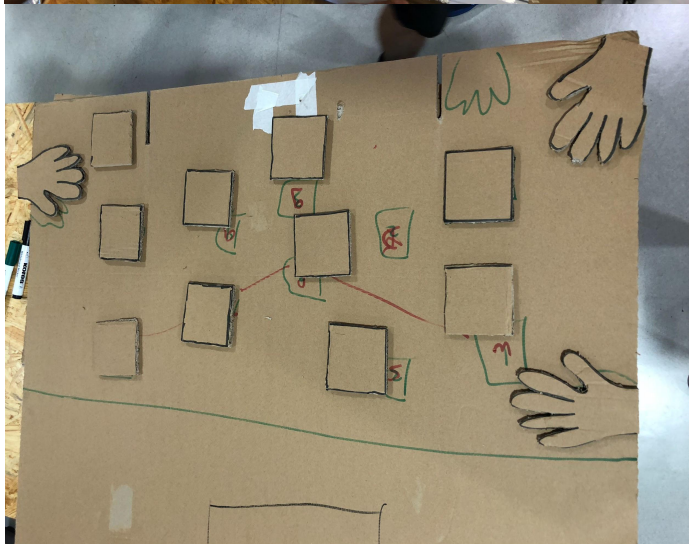
- We divided ourselves into three smaller teams to brainstorm three superheroes, and ended up with Mulan, Rockstar, and the Conductor.
- Each team developed the very first Scratch prototype of each hero and then discussed together the possibilities.

Prototype II

- To further develop we incorporated the idea of having planets for different heroes.
- The heroes will arrive on different planets of music genres, and overcome different tasks by playing their music superpowers.
- We imagined a prototype of having the project played inside a “playhouse” Yungu is planning. This achieved our initial goal of jamming.
- Although it sounded like a brilliant idea, the entire project at some point became too large and complicated in realization.

Prototype III

- We finally incorporate three characters on
- one main masterboard
- two layers, which refer to “Mulan planet” “Conductor planet”
- Guitar refers to the “Rockstar plant”.



Cloud Valley Visit (6/25)

- **Mulan and Rockstar were very well-received**
  - Cultural connections for all ages in Mulan with cultural implications
  - Lulu played the xylophone (live instrument) for ensemble jamming
  - Rockstar, the physical guitar became a visual attraction. The drum sounds were not loud enough however.
  - Dr. Ruthmann made wristbands for the ground
  - Tactile stimuli
- **Feedback**
  - Neck strap for the guitar (better user-experience)
  - Wires had to be rewired completely because they would fall apart
  - Paper would fall apart (material)
  - For foil, use one long piece to wrap it around multiple times
  - Cardboard needs to be robust
  - Nothing unexpected, what they want is really we want them do. Some bugs became incidental advantages in Mulan
  - Fingerboard was too big, thus students struggle to put five fingers at once for the guitar (could make the guitar frets smaller)
  - Students were distracted by chimes (not part of our project), showing that students love to hit random materials

User Testing

Challenges

- Our initial ideas cannot be achieved because of some material restrictions. For example, putting all the characters and sensors together.
- When we were brainstorming the ideas, we didn’t consider the time and resource limitations
- We have little direct feedback from our audience
- Scratch can’t provide some various function

Future Directions

- More interactive (in terms of output)
- Disconnection between ideas and implementations
- Connect more between visual outputs and concepts
- Create a narrative story
- More stable equipments
- Design the equipments with more details