DINFO - Università degli studi di Firenze

GenerativeHCI

Create generative music

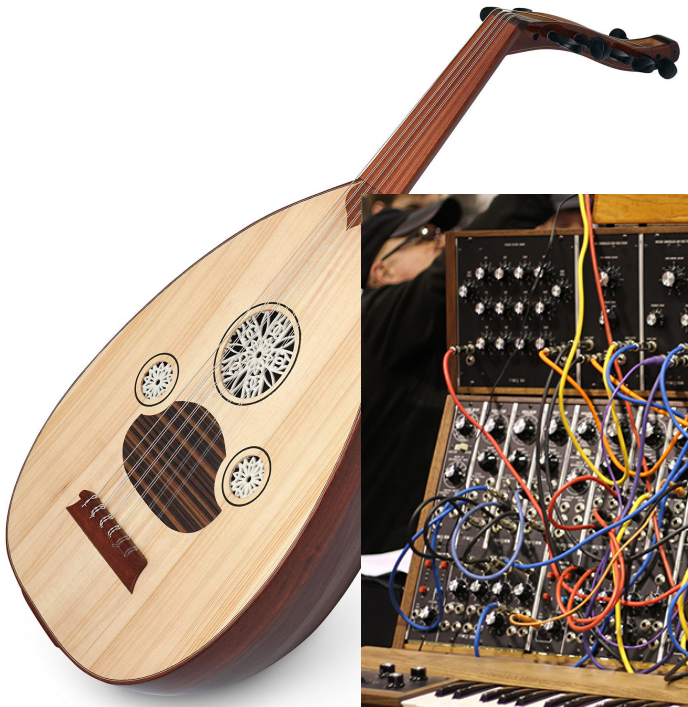
Giovanni Bindi

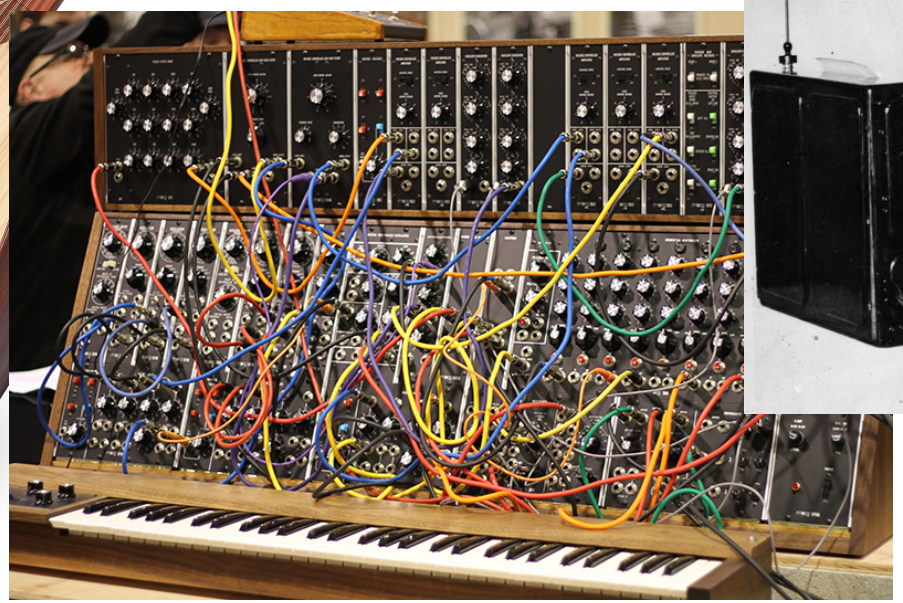
March 2, 2020

Outline

Idea of the project

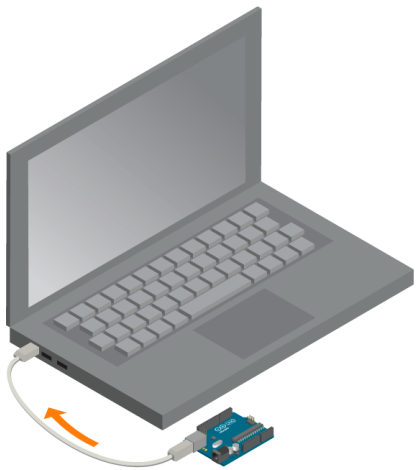
- The idea behind this final project was to research the connections between music production and Human Computer Interaction.





System

Hardware/Software System



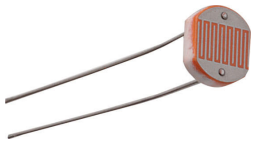
Generative Music

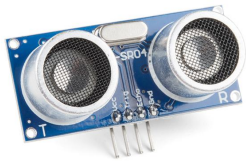
'Endless, ever-changing music created by systems'

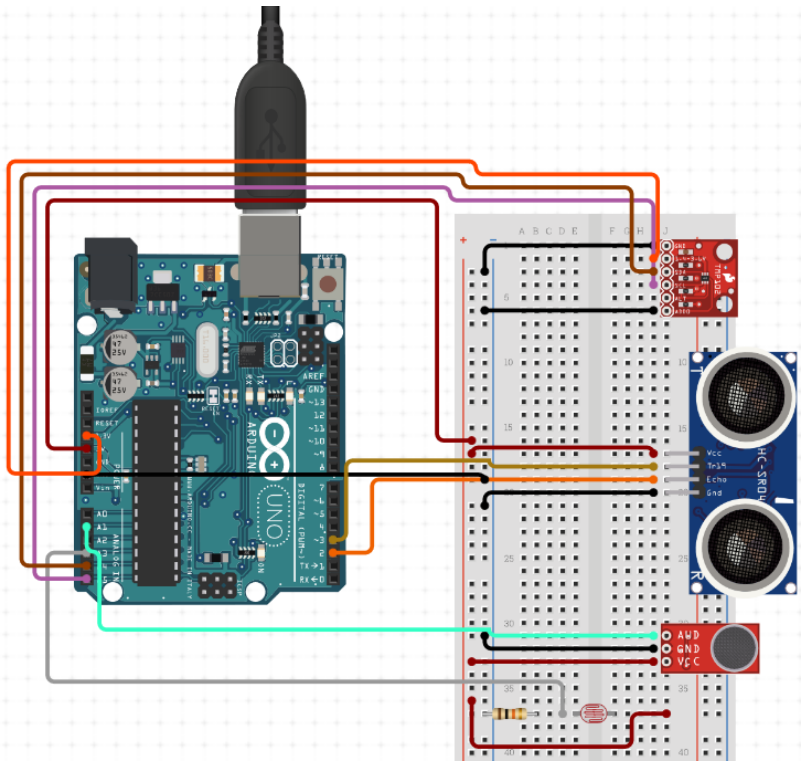
Brian Eno

Hardware

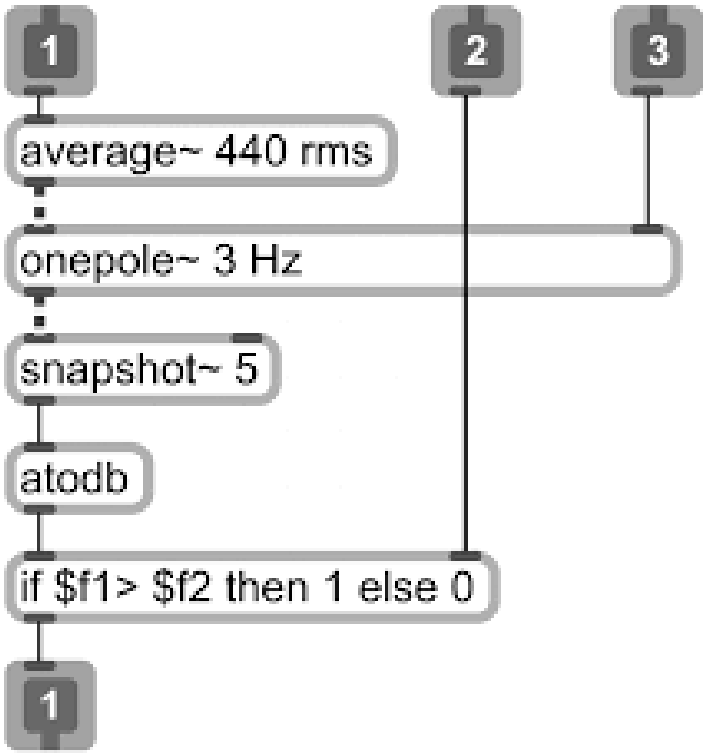
Hardware: Arduino + sensors







Software: Max/MSP



Needfinding

- Interviewees
  1. Mid-twenties males enrolled in an electronic music program.
  2. Mixed group of people with different age and background.
- Questions regarding
  1. Interest in music production.
  2. Interest in a system of this kind.
  3. Usage context.
  4. Defects of other interactive systems (if experienced).

Personas - Daniele, 26 years old

- Music professional.
- Performs several shows, in Italy and abroad.
- Basic computing knowledge.

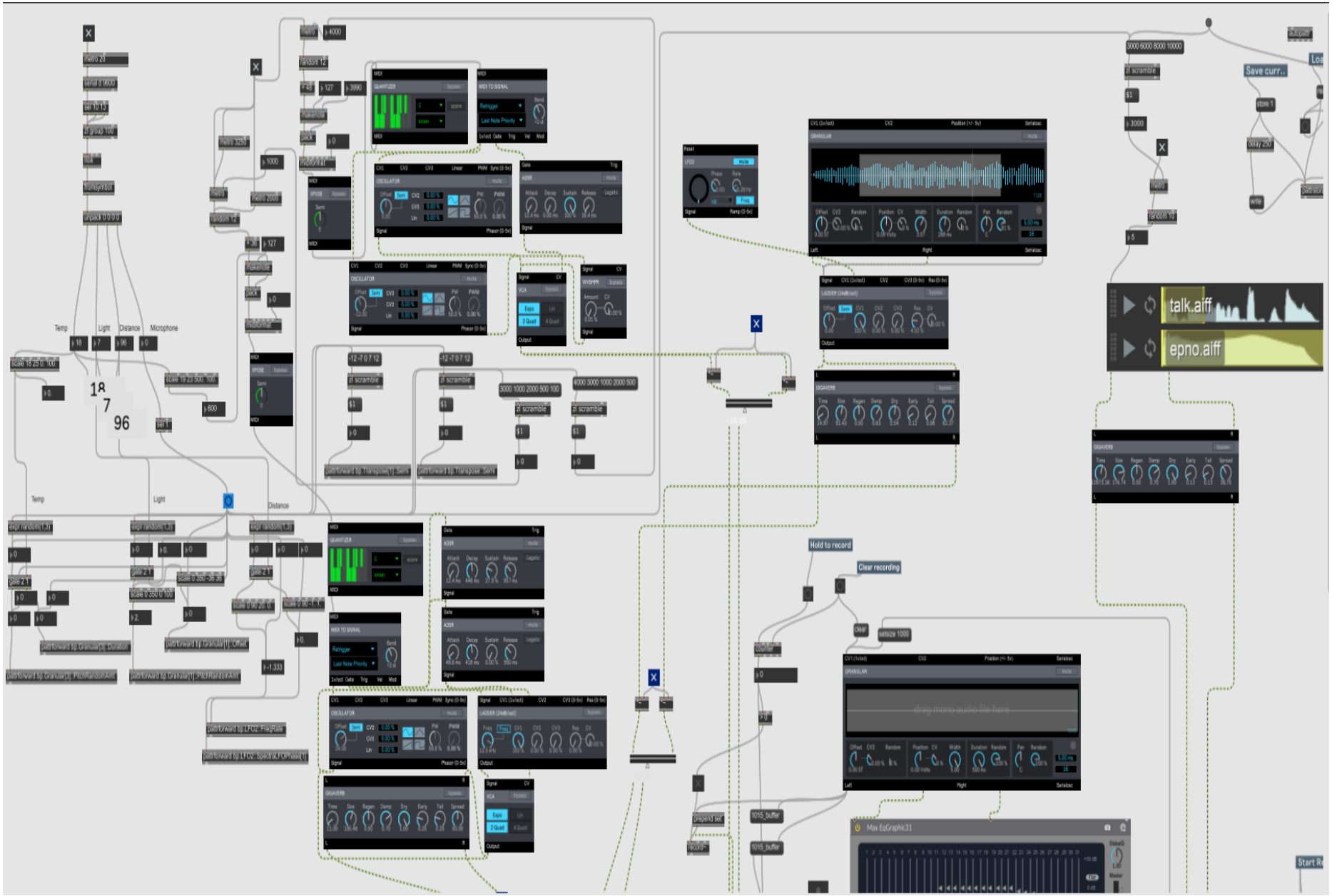
Personas - Giulia, 25 years old

- Contemporary dancer.
- Performs her shows alone or with a company.
- No computing knowledge.

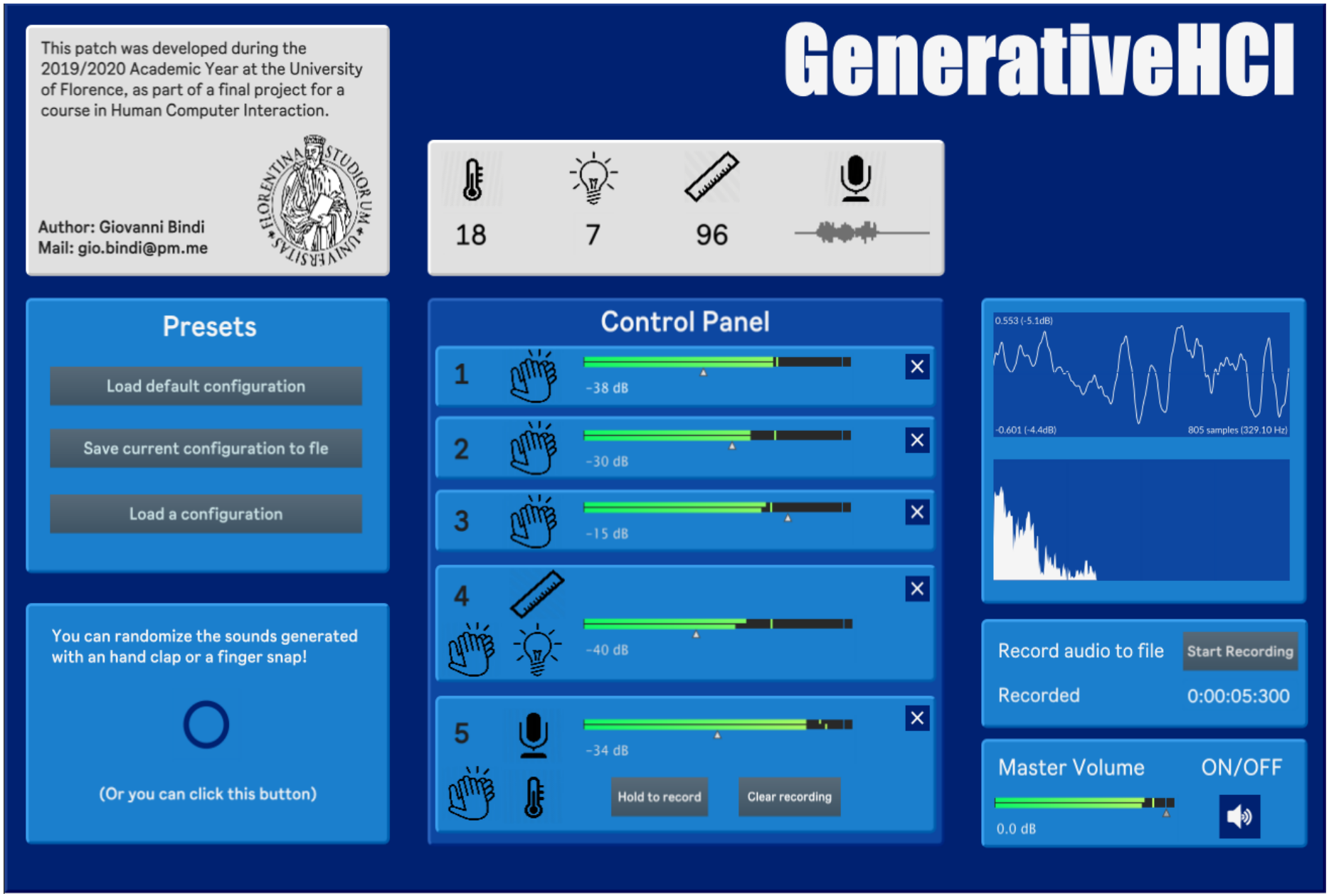
Requirements

- Customizable.
- Portable.
- Easy to use.
- Clear and intuitive UI.
- Able to save and restore a configuration.

Implementation - Music Generation



Implementation - UI



Usability Test

- Two laptops: Windows 10 & MacOS.
- Two groups of people: 4 **professionals** and 4 **amateurs**.
- Four tasks:
  1. Connect the device to the computer and load the Arduino sketch on it.
  2. Open the Max/MSP interface and start playing with the device.

Group 1:

3. Modify the patch in order make the light intensity sensor control the master volume.
4. Save the current patch configuration to a file in order to restore it later.

Group 2:

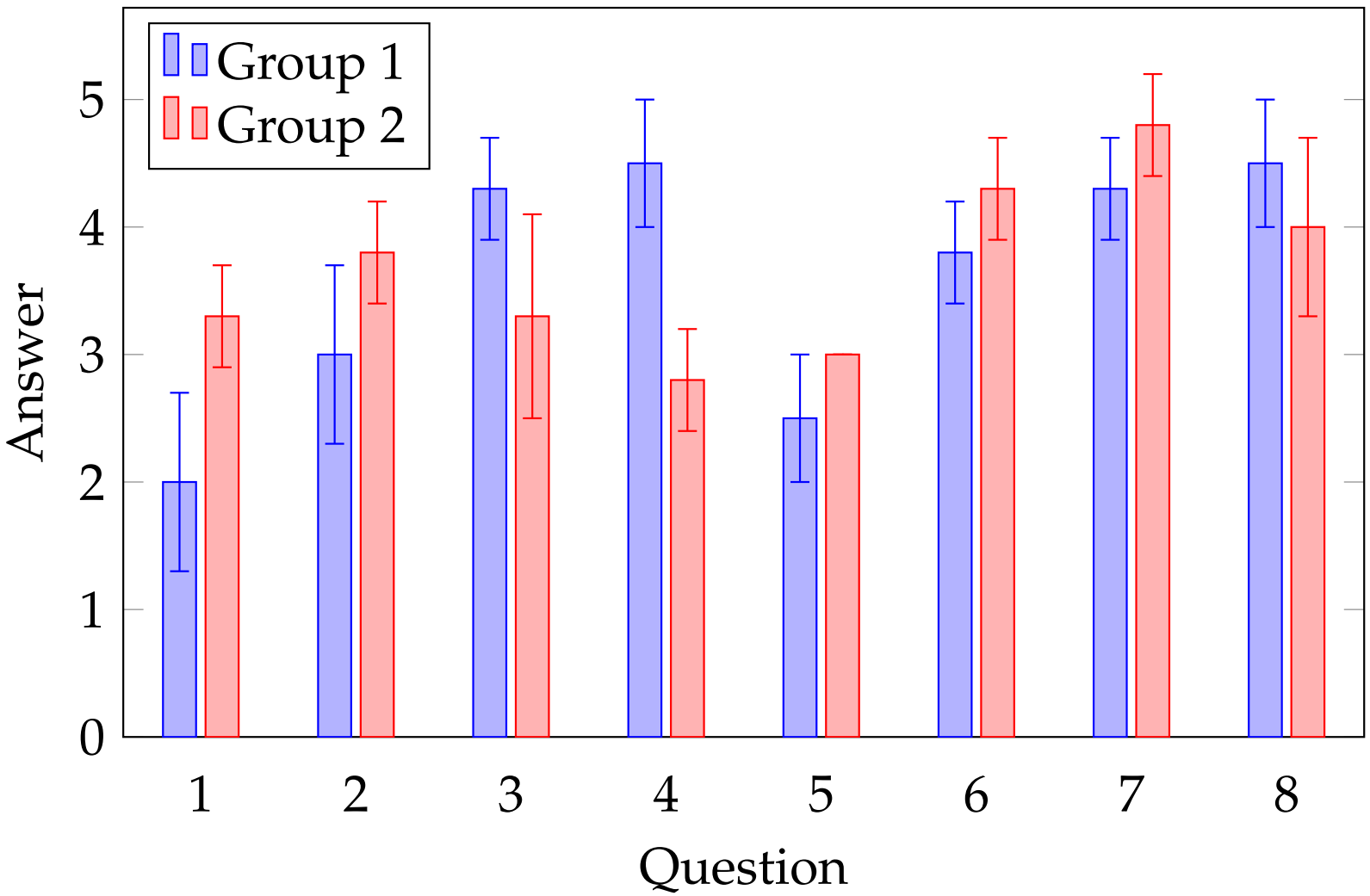
3. Tweak the interface: turn on/off elements, use microphone recordings, randomize the music generation.
4. Save the audio produced to a file.

Results - General

N	Question	μ	σ
1	Task completion required too much effort.	2.6	0.9
2	The Arduino device is accurate.	3.4	0.7
3	The Arduino device is easy to use.	3.8	0.8
4	I can immediately understand what I can control in the UI.	3.6	1.
5	I like the visual appeal of the UI.	*2.8*	0.4
6	I like the sounds I generated.	4	0.5
7	I learned to use the device better after a little while.	**4.5**	0.5
8	Overall, I am satisfied with this system.	4.3	0.7

Table: Answers on a **5-points Likert Scale** to the SEQs.

Results - Differentiated



Conclusions & Furthur Work

A discussion followed the tests.

1. Musicians expressed approval unanimously.
   - One of them will **embed the device in his live setup**.
2. Amateurs were less confident.
   - The teacher thought about using it.
   - The dancer found the sensors too inaccurate.
   - CS students just had fun with it.

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Pros and Cons

Positive comments:

- Simple.
- Cheap.
- Customizable.
- Interesting sounds produced.

Negative comments:

- Interface too simple.
- Sensors a bit inaccurate.
- Max/MSP paid license.