Computer Music – Languages and Systems
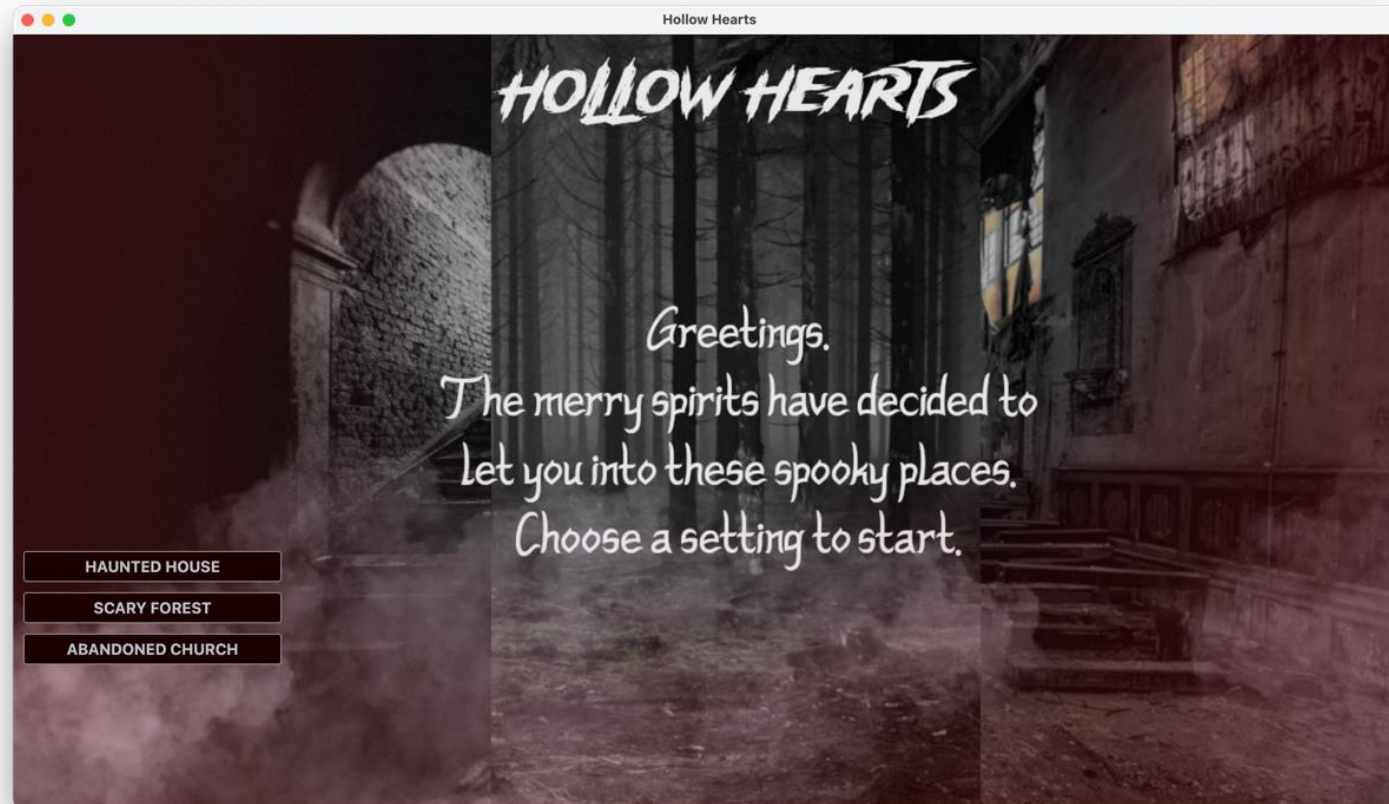
Homework #3
Hollow Hearts

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The project

Hollow Hearts is an interactive horror ambient music generator.

The application reads your heartbeat and takes its information to create a customized horror experience.

Sensors

The heartbeat is read through the **DFRobot Heart Rate Sensor with Gravity Interface**, and it is sent to **Arduino UNO**.

Arduino UNO flashes the **Gravity Digital RED LED Light Module** according to the pulse and sends signals through serial communication to **SuperCollider**.

The Heart Rate Sensor is connected to *Analog Port 3*. The Digital RED LED to *Digital Port 3*. Arduino UNO is connected to the computer through *USB*.
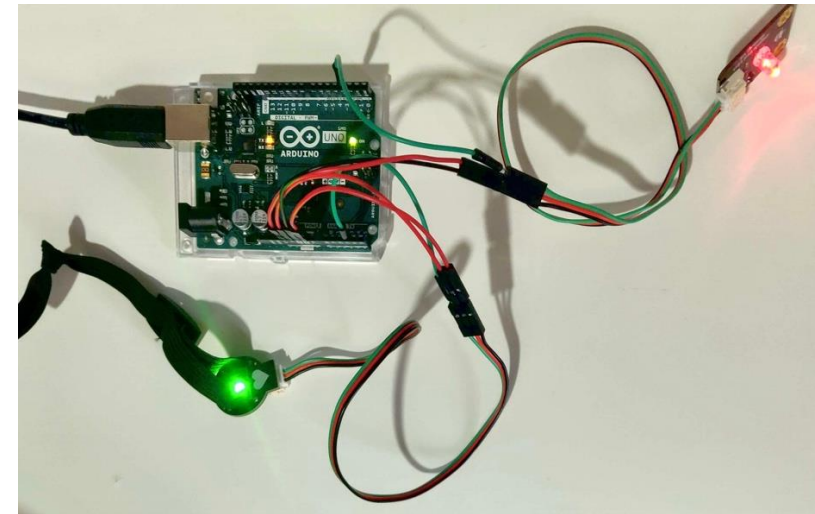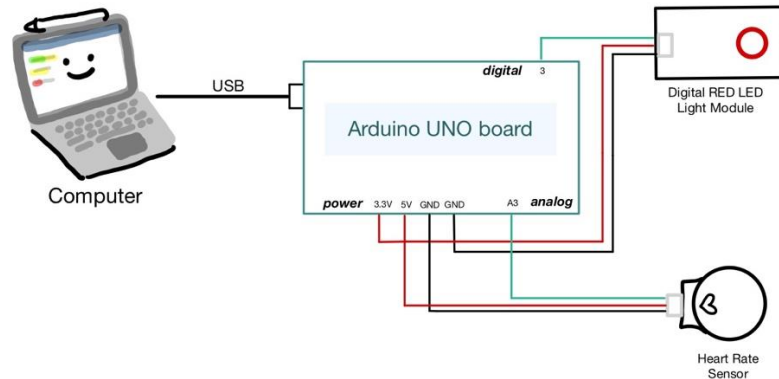
Implementation

The applications has three possible scenarios: **Haunted House**, **Scary Forest** and **Abandoned Church.**

Each scenario has some characterizing sounds that are played on a tempo based on the **heartbeat.** Independently from the scenarios the heartbeat plays constantly.

The program at every heartbeat checks whether a specified sound is supposed to play based on the time instant, the scenario and some randomization.
The frequency is chosen from notes that belong to the **A Harmonic minor scale**, and after some time it modulates to another harmonic minor scale.
The chosen amplitude is meant to keep a balanced mix. There is also some randomization on the pan.

Haunted House

The sounds in the house setting are:
- flute and violin
- glass-like synth
- carillon

In addition there are door and steps samples.

The glass-like synth has a delay parameter that is based on the heartbeat **bpm**.

Scary Forest

The sounds in the forest setting are:
- wind/watery pad
- sub bass
- tribal percussions

In addition there are a wolf howl, a rising wind and two different steps samples.

The sub bass has a delay parameter that is based on the heartbeat **bpm**.

Abandoned Church

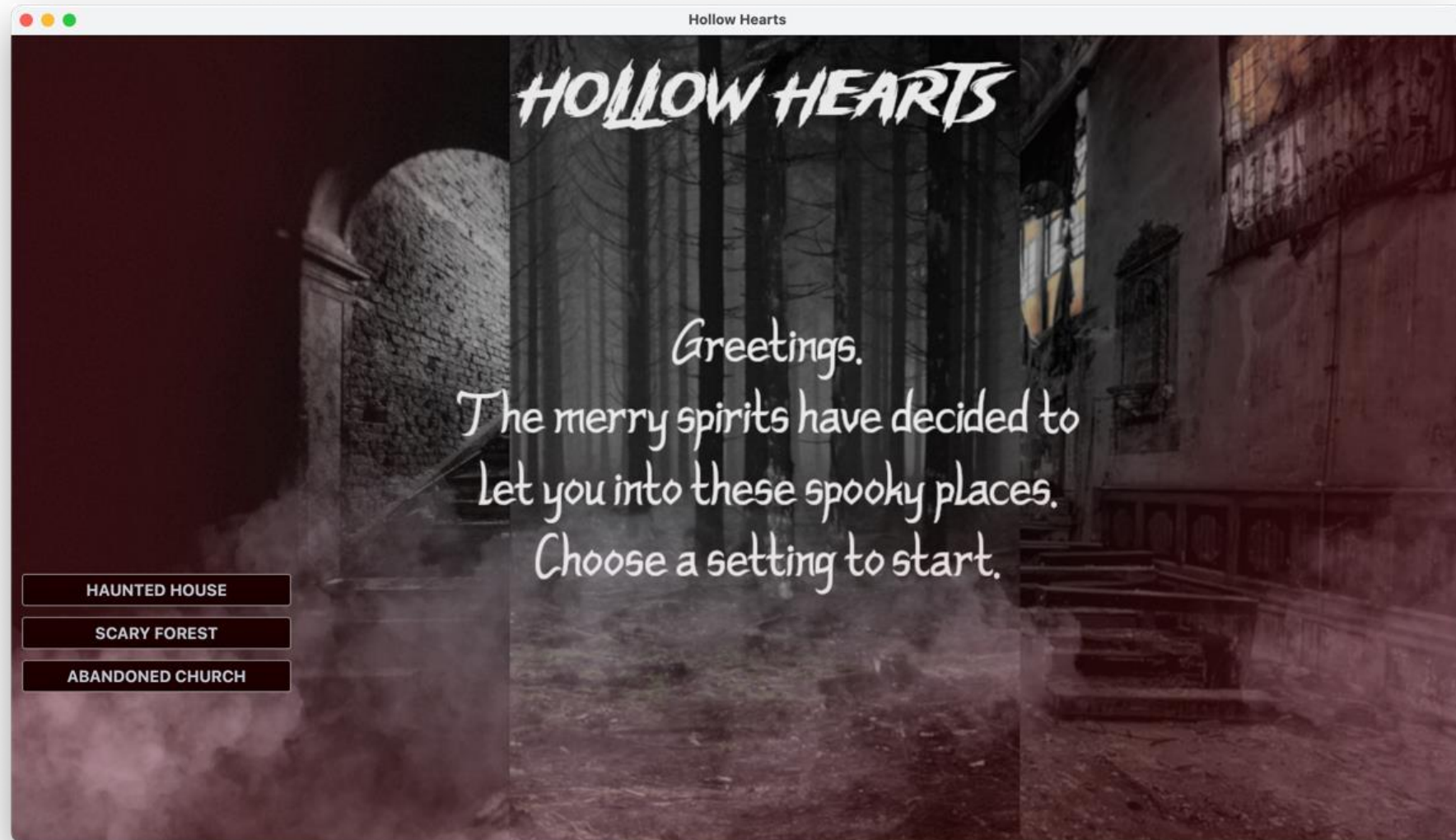The sounds in the church setting are:
- bells
- organ
- harpsichord

In addition there are chains sliding on the floor and a deep choir samples.

The organ is modulated with a pulse whose width is controlled by the **bpm**.
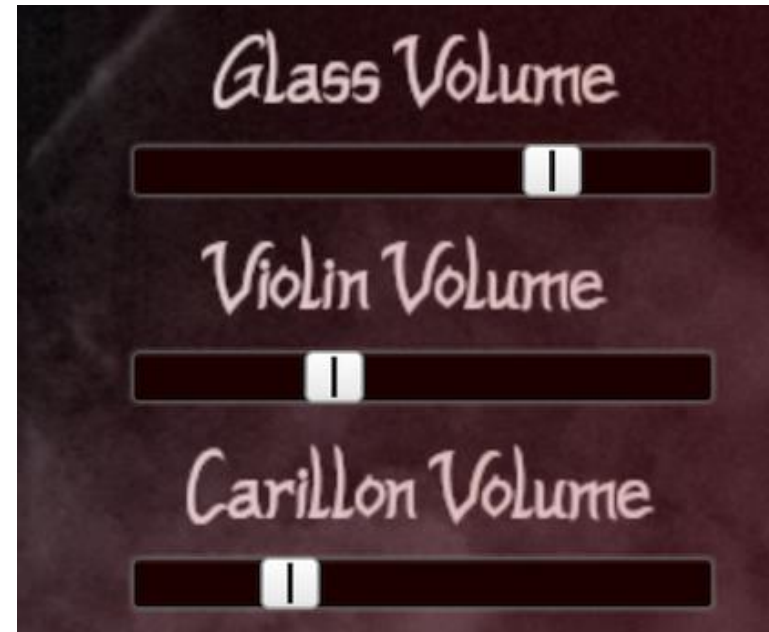
GUI

GUI

In the GUI there are buttons that allow the user to choose the scenario and a *"Run Away"* button to go back to the intro scene.
In each scenario there are three volume sliders that allow to change the volume of specific setting sounds.

Possible uses

This application can be used to enhance the experience in several different fields, from **horror games** with immersive tools such as VR to **movies** and **audio books.**

As our heartbeat tends to match what we are experiencing as we are experiencing it, adapting an ambient sound to the heartbeat itself is an interesting feature that can be studied and explored.

Demonstration Video