Motion Clock: The Affordable Silent Alarm

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BACKGROUND

Alarm clocks are a fundamental part of our everyday lives. As a society, we use them to wake up on time so we can guarantee we make it to our daily obligations on time. This is whether it's work, school, an appointment, or anything else. However, it's important to note that audio alarms can't be utilized for everyone; individuals who are hearing-impaired cannot make use of it. Not only that, but it can also be inconvenient for couples sharing a bed if they have different schedules. This is an issue considering most of the alarm clocks in the market were designed with audio in mind, and the few non-audio alarms on the market are typically unaffordable and can be cumbersome to use. This is the issue we wish to address with Motion Clock.

PROPOSED SOLUTION

We sought out to create to create an alarm that primarily focuses on vibration to function. This will be relatively cheap compared to its competitors, and easy to use from the comfort of your own phone with our customizable Motion Clock application.

To make the alarm cheap and easy to use, it was designed with the idea to only use two major electrical components and be controlled directly from your phone from an app we designed from MIT App Inventor. The alarm functionality was to be programmed onto an Arduino Nano Development and can be controlled from the phone via a Bluetooth receiver. From your phone you can set the time you want the alarm to go off, as well as customize the intensity of the vibration as well and its frequency. The Arduino Nano Development Board is connected into a USB cable and placed into a small CAD designed box to be placed under a pillow. The CAD box's dimensions were designed with the size specifications in mind.

FINAL PRODUCT
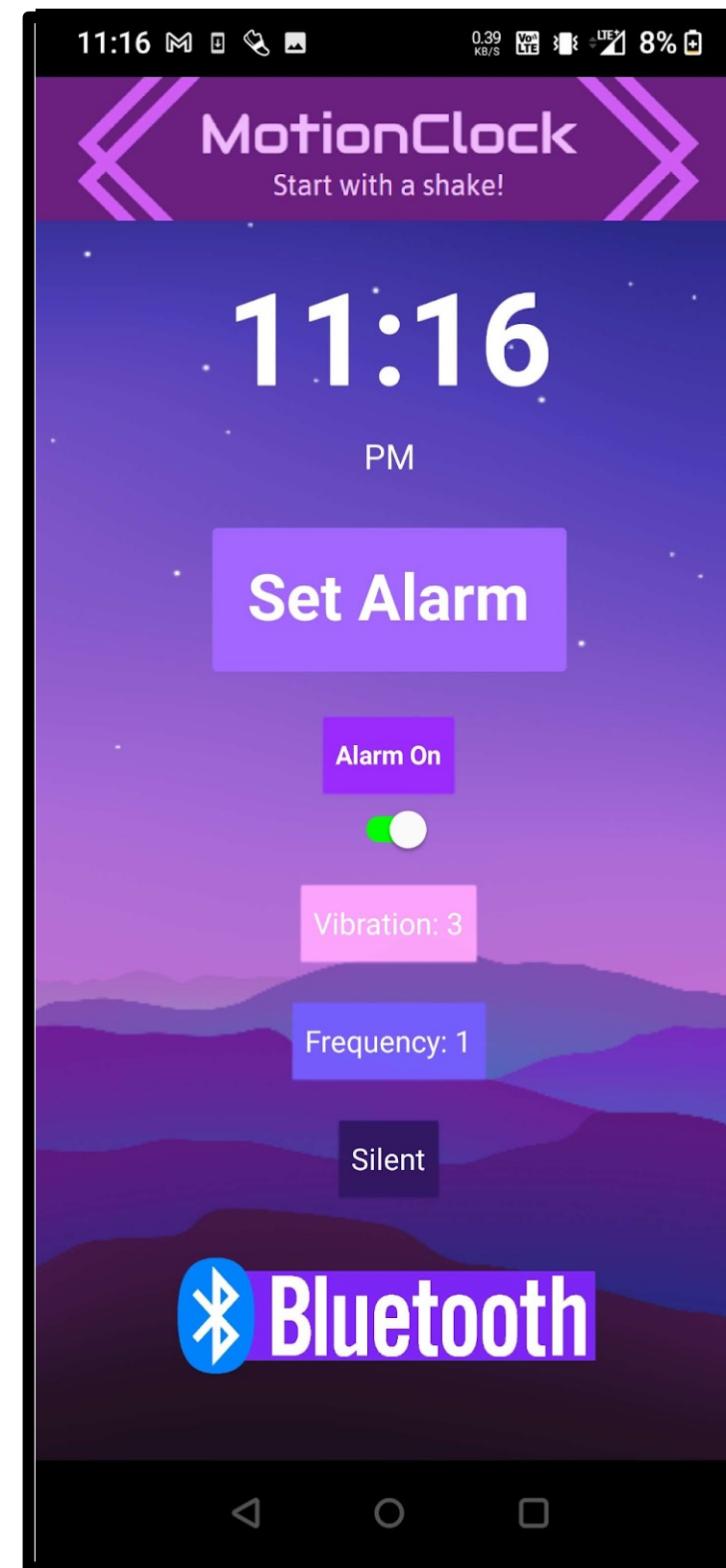
Motion Clock App
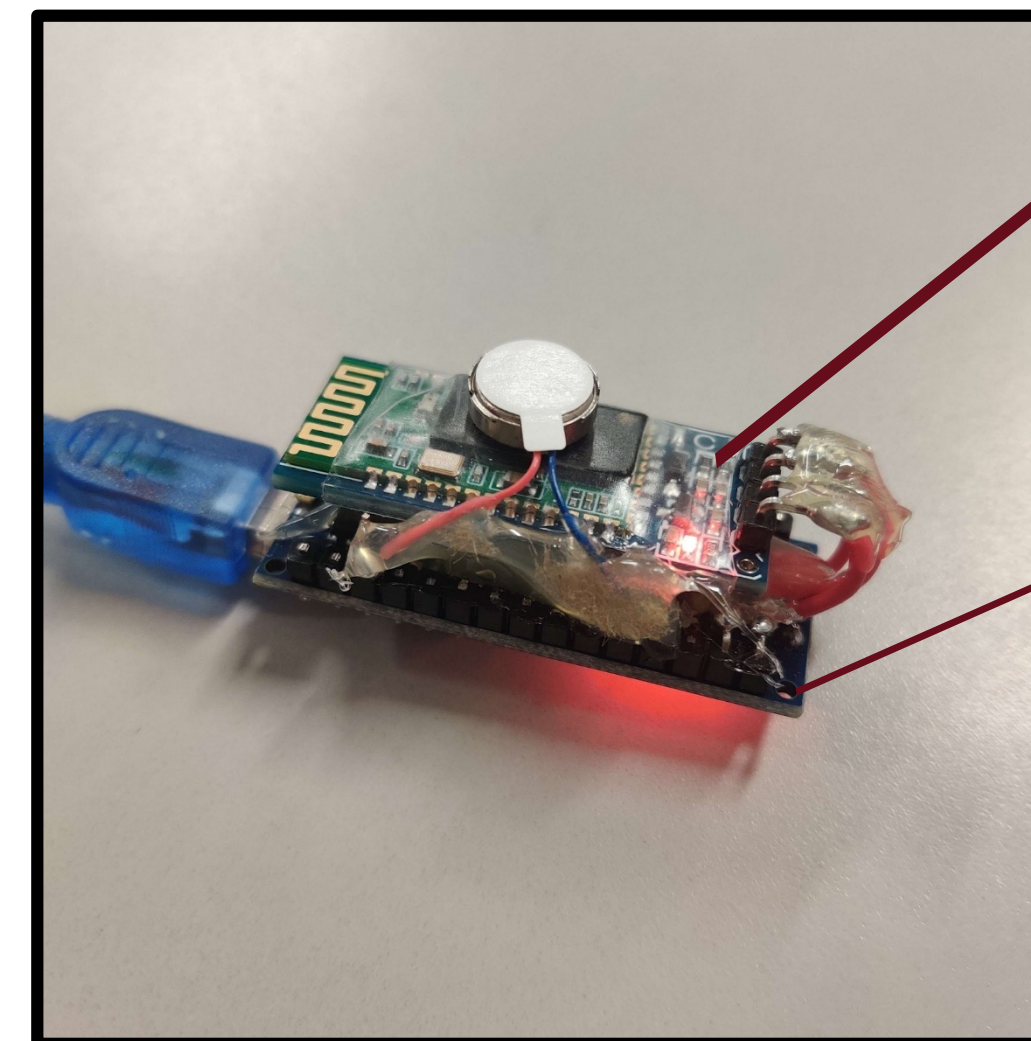
Arduino with Bluetooth Receiver

SYSTEM LEVEL DESIGN

MAJOR COMPONENTS

HC-06 Bluetooth Module
This HC-06 Bluetooth Module acts as a receiver. This is what triggers the Arduino to go off and vibrate, functioning as an alarm.

Arduino Nano Development Board
Arduino is flexible and easy to use. This nano board is the basis of Motion clock, as it will vibrate in response to receiving an input from the Bluetooth Module.
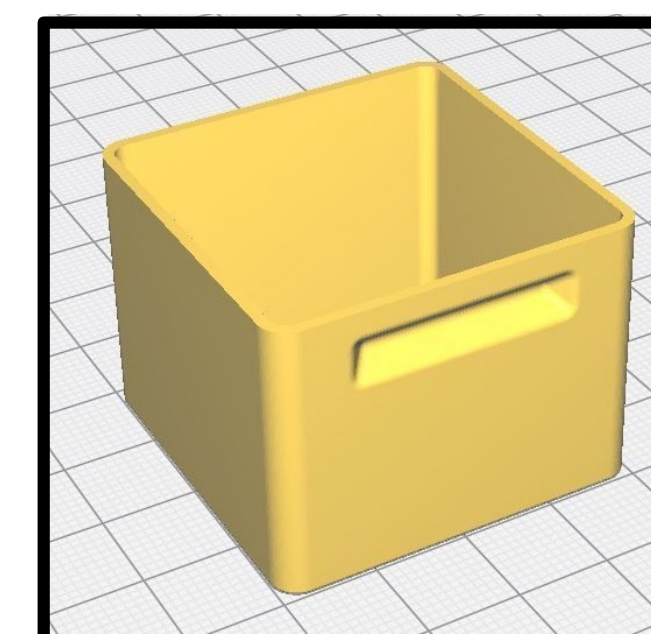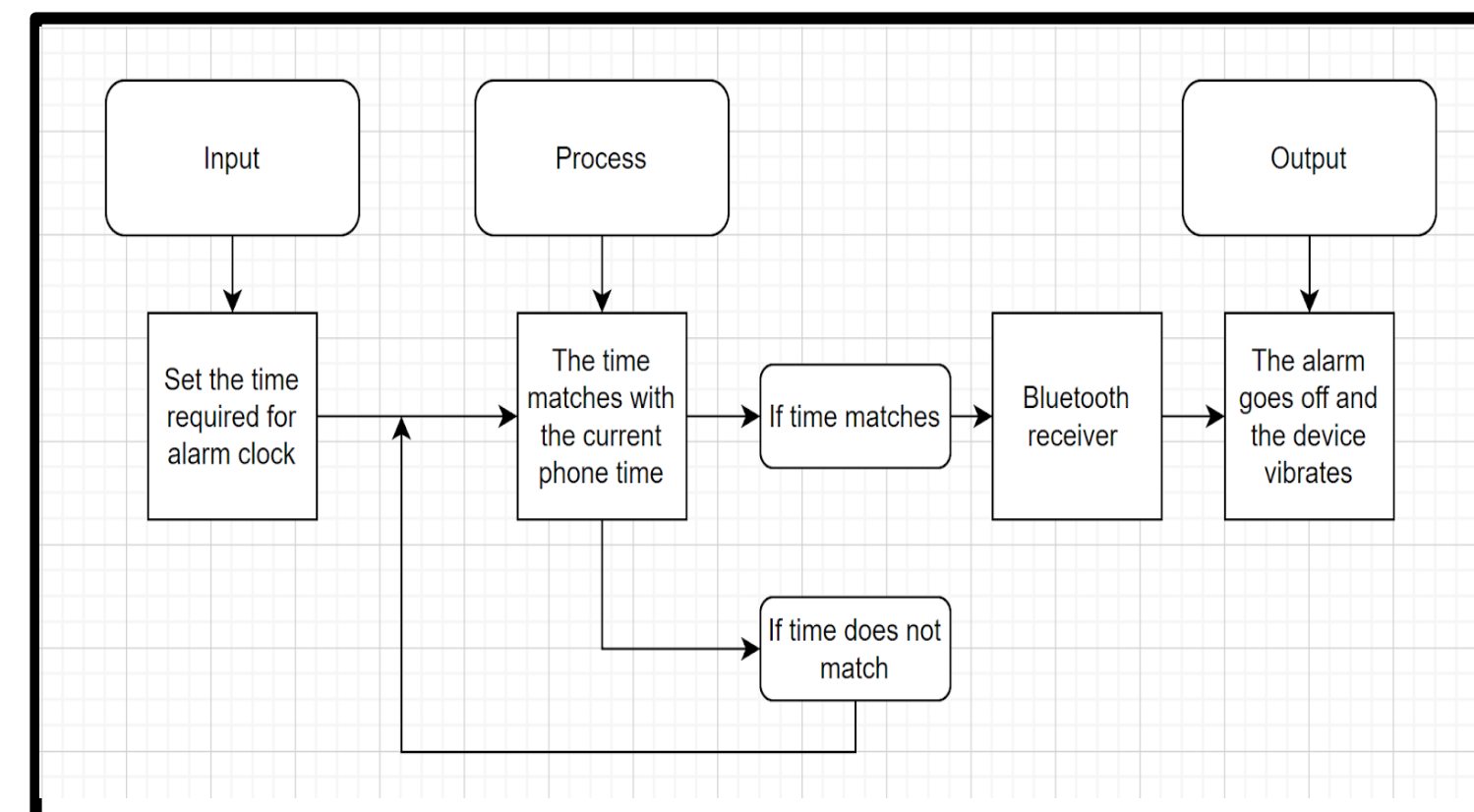
3D Printed Box
The rectangular box stores the Arduino Nano Development Board and HC-06 Bluetooth Module. Designed with a slit for the USB to go through, and the Arduino's vibration doesn't get muffled.

FUTURE DIRECTION

The nature of the project lends itself to several features that can be implemented simply via additional coding. Such possible features include:

- Snooze feature
- More vibration pattern
- Multiple different alarms
- Song selection
- Battery controlled

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CONTACT INFORMATION

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