ChromaCubEEE

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IEEE QP Team 17

I. Introduction

    A. The project's main goal was to provide some sort of a solution to help overcome the challenges associated with the difficulties of personal productivity and staying focused, alert, and motivated to complete a goal, assignment, or task. One of the most common issues that one faces is a tendency to lose focus or get distracted from completing their tasks or plans, which can be attributed to this day's technologically advanced society and social media dominated world. To stay productive and focus on one's tasks and goals, time management and awareness is needed. Staying zoned in to complete a task can be a daunting task with constant distractions with the internet, social media, and everyday life. Homework, projects, studying, and overall productivity can be truly impacted by one's phone and desire to freely allocate time towards staring at the device rather than doing productive work. Our project attempts to help deal with the issue of cellular devices hindering one's productivity potential, by providing a visual attention grabbing lamp to remind the user the time they lost which could have been allocated to better use.

II. Motivation

    A. We created ChromaCubEEE with the intent of helping people become more aware of the amount of time they spend on their phones, when, in fact, they intend to be working or studying. As college students, we were motivated to build something that could insist our fellow college students in being reminded to get off their phones and work after a certain period of time. Sometimes people need visual and blatant reminders to get off their phones, and the Chroma CubEEE with its flashing lights is intended to serve this purpose. Overall, the productivity lamp created is meant to be a visual reminder and motivational device the user can utilize towards being productive in completing all tasks, assignments, and work that needs to get done.

III. Week-by week timeline

    A. Week 1:

        1. We brainstormed ideas and considered the most prevalent problems society faces regarding productivity. Eventually, we settled on creating the Chroma CubEEE idea.

    B. Week 2:

        1. We brainstormed and developed a timeline for the rest of the quarter.

    C. Week 3:

        1. We created the user application and started the arduino code.

D. Week 4:

    1. We started building the lamp with the LEDs and breadboard.

E. Week 5:

    1. We continued to build and test the lamp with the user application and arduino code.

F. Week 6:

    1. We made final decisions on how we wanted the lamp to function ie which lights turned on after a certain amount of time.

G. Week 7:

    1. We began testing the lamp and LEDs while making adjustments to the Arduino code as needed.

H. Week 8:

    1. We tried to 3D print a cubical lamp structure, but we were unable to do so. Instead, we brainstormed of other methods for building the lamp.

I. Week 9:

    1. We did some final testing and debugging with user interface application, arduino code, and LED set up. We additionally finished making the lamp structure with a pre-made container.

IV. How-to-use

A. The Chroma CubEEE will only work for Android phone users. Users first need to download the Chroma CubEEE application using a QR created

through MIT App Inventor. After they open the application, they have to connect to the HC06 bluetooth module, and when they are about to browse on their phone they can press the green START button to begin the lamp's timer. After 30 minutes, the green LEDs will blink five times to alert the user of the amount of time they have been on their phone. Once the LEDs stop blinking, the user can then press the red END button on the application to end the timer or continue being on their phone. If the user chooses the latter option, the yellow LEDs will blink five times. Once again, the user now has the same two options as before. If the user chooses the latter option again, the red LEDs will blink five times, and then the timer will end regardless of whether the user pressed the END button. It is important to mention, with the way the code is currently written, users may only press the END button once any of the LEDs have stopped blinking in order to receive the desired outcome.
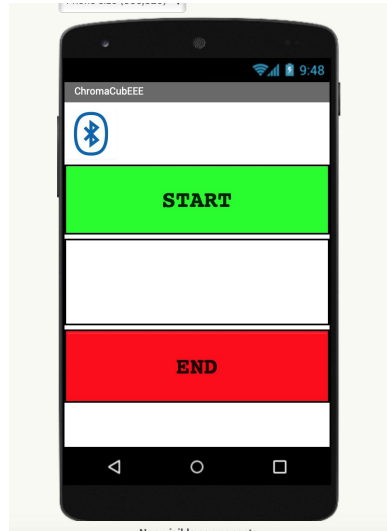
Figure 1. Current ChromaCubEEE application contains a simple environment. 'START'

begins an internal timer that will cause LEDs to blink when time at predetermined

intervals. 'END' stops the timer and any current LED blinking. Created using MIT App

Inventor
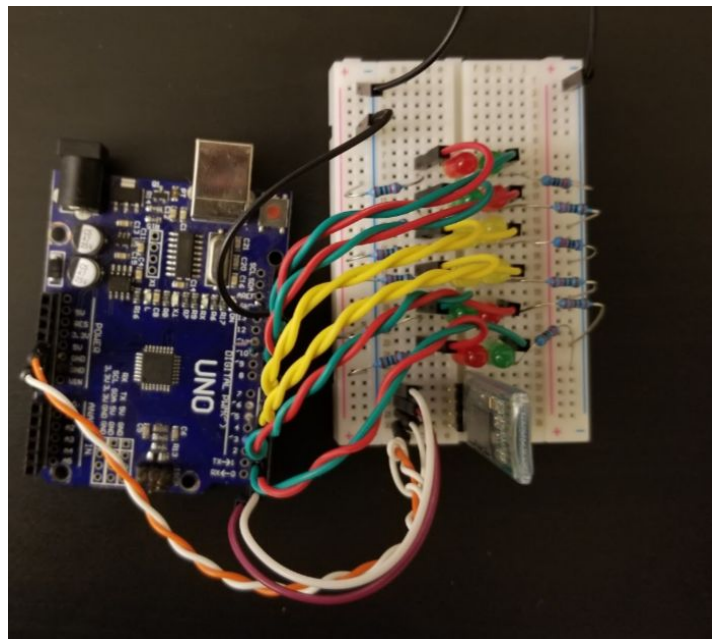
Figure 2. Circuit, involves an Arduino Uno, breadboard, leds, HC06 bluetooth module,

and wires

Figure 3. Lamp

V.   Teammate contributions

    A. Sydney Wong: I contributed by developing the application users use to turn the lamp off and on. To do this, I used MIT app inventor. The basic application features start and end buttons and is able to connect the phone to the lamp through bluetooth. I also wrote the arduino code that is used for the lamp's functionality.

    B. Jacob Hohn: I contributed to ideation and brainstorming the ChromaCubEEE idea and making a model of our project in Solidworks. Unfortunately, it wasn't feasible to 3D print our model, so we looked to other options to house our project. I also contributed to testing/debugging code and our final set up.

    C. John Ruffy: The contribution that I provided to the team was in working on the hardware portions of the project. I physically worked with the arduino to wire the leds, connected the HC06 bluetooth module, edited the code to the right arduino pin numbers utilized, and ensured the working ability of

the lamp. Having the android to test the capability of the project, I worked

closely with the product to test its functionality.

VI.   Real-world applications

    A. Any person who wants to change their habits of living a distracted life

could utilize the ChromaCubEEE. It gives the power to the user to realize

they spend more time on their phone than they think they do. In its current

stage, ChromaCubEEE contains hard coded times for when the LED lights

will blink for different stages. In the future, this application could be

personalized for the user to set time increments when they want the LED

lights to blink. The ChromaCubEEE could be placed on one's desk, where

before going on their phone they start the lamp via the app and the

visualization of the colored cube will provide the user a blatant reminder of

time spent on their phone instead of working. The ChromaCubEEE has

the mission of increasing the productivity and time management of its

users, where in the real-world the visual piece will be a constant reminder

to stay focused and grind to get work done, in order for success and

overall greatness in being a productive person.

VII.   Difficulties/challenges

    A. We faced one difficulty while trying to create the outer lamp structure.

Originally, we planned to 3D print a cube with holes to fit around the LED

set up. Unfortunately, we ran into problems when trying to print, and for

the sake of time, we had to improvise by creating a lamp structure out of a store bought container.

B. Originally, we wanted to receive phone usage data from the phone using a phone's internal screen time feature. However, we could not figure out how to collect the data from the phone and had to switch to a different method of data collecting. Our solution was building an application which would start a timer.
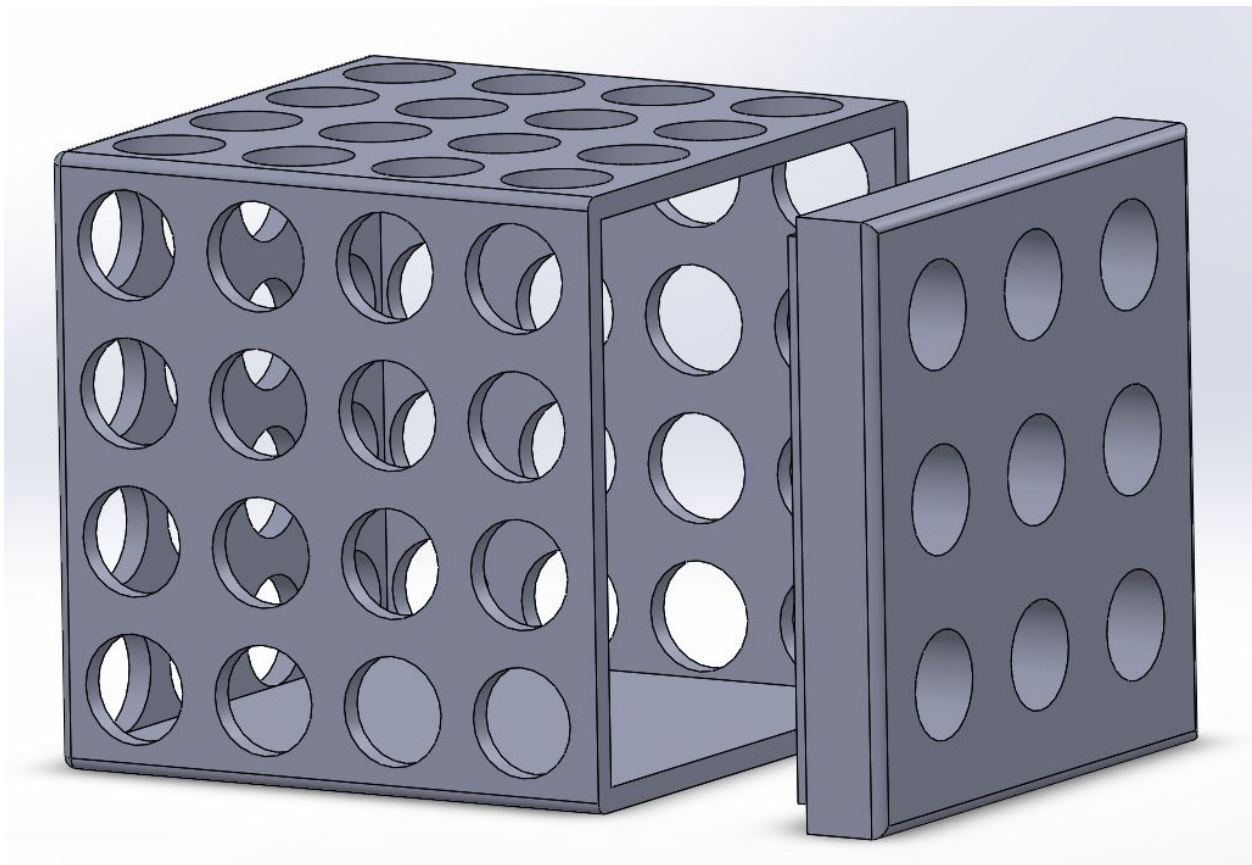
Figure 4. Original conception for container to house arduino LED setup

VIII. Improvements/enhancements

    A. If we were to extend this project into the future, we would focus on developing a better lamp structure. One of the biggest problems with the Chroma CubEEE is that it is not shaped like a cube as our group originally intended. Therefore, a major improvement would be building our own lamp structure that is a cube and not created from something that was originally store bought.

    B. Another enhancement we would make is improving the accuracy of the timing between the display of each color. Prior to the showcase, we were unable to debug the arduino code so that the time between colors actually reflects the intended amount of seconds. Correct timing is an important factor for users so we would try to fix this in the future.

    C. We would also try to improve the user application in the future. The user interface is not that well designed and reflects a very basic version of the lamp's capability. The application is not aesthetically pleasing and also is hard to use at times because the user cannot immediately tell if the start/end button they pushed actually set off the timer. To step it up, the interface would not only be more aesthetic, but have extra capabilities like setting how much time should be allocated for being on the phone.

    D. Another detail that could have been added involves the hardware, with the circuitry of the lamp being soldered.

IX.   Conclusion

A.   Overall, we were able to develop the foundation of a lamp which would help with user productivity. Aside from the issues and improvements which could be made in the future, we developed a product which would remind users, especially students, to get off their phones when they intend to work. Our team also learned a lot about teamwork, the process of brainstorming to creation, and how to circumvent unpredictable obstacles. We were still able to make achievements despite the multiple issues which arose throughout the quarter. The QP quarterly project was a really good learning experience as it enabled for first hand experience on working as a team towards a common goal of creating a product to help provide a solution to the challenging problem we were expected to combat. The process itself from the start of the quarter was good, as the various workathons and supplies provided, allowed us to convene and work towards creating a product that we brainstormed. This quarterly project allowed us to come up with an idea, work towards implementing it, and then having a product to help increase productivity. Overall, this process was advantageous for providing extra practice with working in teams, utilizing the knowledge learned in courses, and having a hands on project that provided more experience that will help in our future careers and lives.