Anti Procrastination Device

Group 19
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Spring 2022
Objective - Problem

- Procrastination is a habit of life that is plaguing our society

- Productivity and throughput and even quality of life is hindered by procrastination
The World Without Procrastination
The World With Procrastination
Introduction - What is the solution?

- Designed to discourage procrastination while working online.
- Connects to either a PC or laptop via Bluetooth.
- Emits an annoying buzz when on specific websites/applications or away from the computer.
Evolution of the Design
Main Changes From Previous Versions:

- No longer a shocking watch, instead annoys user with an annoying sound
- Replaced ATtiny microcontroller and BlueTooth module with ESP32
- Added IR sensor and 5v boost converter circuit
Final Design

Subsystem Overview:

- **Power Subsystem**
  - 3.3v Voltage Regulator
  - LiPo Charging Circuit - MCP73831 IC
  - 5v Boost Converter Circuit - UM3429S IC

- **Control Subsystem**
  - ESP32 and BlueTooth
  - IR Sensor

- **Output Subsystem**
  - Piezo Buzzer

- **User Interface Subsystem**
  - Chrome Extension Software
  - Main Desktop Application
  - Frontend Software
Design - Power Subsystem

Charging Circuit

5v Boost Converter Circuit

3.3v Regulator
Piezo Buzzer

J5
PIEZO

1
2

PIEZO

GND
PCB Design

If this doesn't work then we're screwed.

Kyle Chiu
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Hardware Challenges

- PCB Issues
  - Incorrect Footprints
  - PCB Ordering

- Connection Header Compatibility Issues

- IR Sensor Pins
Design - User Interface Subsystem (Software)

Main Components:

- Website and Application Detection
- Communication Between ESP32 and Python Script
- ESP32 Arduino Code
- GUI For Blacklist/Whitelist Modification
Current Tab and Application Detection

- Chrome extension detects tab that is currently in focus

- Localhost server keeps track of the current focused website, needs to be updated by the chrome extension, and can be queried by the python script

- Python script has lists of blacklisted and whitelisted websites and apps. Gathers a list of all open applications and queries server for current url every 2 seconds and looks for matches in blacklist.
Communication Between ESP32 and Python Script

- If the Python script detects a blacklisted website/application, it will send a message to the ESP32 to start buzzing.
- If the Python script does not detect blacklisted websites/applications it will send a message to the ESP32 to stop buzzing.
- ESP32 sends messages back to the Python script terminal based on its status.
GUI For Blacklist/Whitelist Modification

- Allows for visualized addition and deletion of applications/websites to a whitelist/blacklist
- GUI created with React framework
- Data stored in JSON file and modified via local Express backend server
- Changes in JSON updates to our software in real-time
Conclusion

- Overall we are happy with how our project turned out. It works well in the areas that we hoped, detection of distracting apps or websites and keeping the user at their desk. We were disappointed that our snooze button was unable to be integrated and we believe that it was due to setting a pin to digital high on the ESP was not the same as the soldering assignment which we based out button on.

- One important thing that we learned was to get hardware working as soon as possible, because software does not have shipping delays like hardware!

- If we were to redesign the project we would do more testing with the ESP and button to make sure we have a way to register button presses.

- Further work that can be done to improve the device would be to allow the user to set parameters for the IR detection to allow for different postures and placements of the device.
Thank You

Any Questions?
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