Project 3: Wearable Device

Overview:

We will be spending the remaining six weeks of this course building high-fidelity prototypes of wearable devices from the ground up. You now have enough base knowledge to design devices that include a small PCB component, an Arduino device (e.g., the Bean), and, potentially, an iOS/Mac program that links via Bluetooth. This is your opportunity to be creative and to have fun -- we want to see cool devices that people would enjoy if they were a commercial product.

Device Expectations:

You will build a **wearable** device that has some **real-world application or purpose**. It will include (at bare minimum) one novel component and will involve a balance of software, hardware, and physical design to achieve its purpose. The device's purpose will be **interactive —** hardware should extend beyond passive monitoring, and should expect to be used, interacted with, or triggered in some way by the user. A successful device will **effectively and efficiently maximize the usage of each component** it utilizes and be **modular** in its design of both software and hardware. Hardware will be **minified** and **nicely integrated** in the wearable design.

Each device must have a 1in x 1in surface-mount PCB designed by your team, and we will be fabricating the PCBs through OSH Park (the course will pay for the initial fabrication).

Teams:

Teams will be of size 3-4 and will contain students with a balanced range of expertise in each of our focus areas: Hardware, Software, UI/UX Design. Each team will have one member 'take point' on each focus area; no team member should be in charge of multiple focus areas. Teams will be expected to meet regularly and **keep a record** of their meetings and what they accomplish. While teams may, at times, take a 'divide-and-conquer' approach to completing different tasks, we expect that all members will be involved in all phases of the project to make meaningful contributions in all of the focus areas. Your overall grade will take into consideration your group's ability to come together and work effectively, as well as each member's ability to **contribute equally** to the final product.

Budget:

Each team will be given a Visa Gift Card worth $50. These should be used to purchase necessary items (sensors, output devices, etc.) for your device (not including the initial PCB fabrication). Your team can use the resistors, capacitors, and LEDs from the course, but you should ensure that we have the ones you need. Unused funds will be returned to the course. All teams will be required to itemize their purchases & provide receipts.

Major Deadlines:

This project will consist of 5 major deliverables, with some intermediate deadlines:

- March 14 — Project Proposal Due
- April 1 — Phase 1: Hardware Component Due
  ★*(PCBs will be ordered on March 31 and returned by roughly April 18. Plan your timeline accordingly)*
- April 15 — Phase 2: Software Component Due
- April 29 — Phase 3: Final Device Prototype Due
- May 5 — Project Showcase (@ Artisan's Asylum)
- May 6 — Final Deliverable due at 5:00pm

Grading:

Project grades will take into consideration the following:

Team's Device (40%):

- Device's Wearability
- Device's Functionality
- Device's Effectiveness/Efficiency in achieving its purpose

Team's Project (20%):

- Project was conceptually challenging
- Project was technically challenging
- Project saw consistent and iterative improvements

Written Work (20%):

- Reflects a clear sense of plan and purpose
- Includes thoughtful justification of design decisions
- ...and identifies alternative approaches to design [as a back-up]
- Goes into appropriate depth on the subject at hand
- Covers all topics specified in assignment

Individual (20%):

- Contribution to Group. Teammates will be asked to provide input on their teammates participation.

Points may be deducted if:

- Your work is not received in a timely fashion
- Your device is not wearable
- Your project is driven by a single focus (Hardware/Software/UIUX) with little attention to the other two
- Your device includes a breadboard (or other prototyping materials) in its final design

Project Showcase:

Final presentations will be **May 5th, 6:30-8:30pm** at the ***Artisan's Asylum, Union Sq., Somerville***. The asylum is easily reachable by bus / Uber, and we can work out transportation details if necessary. If you, for any reason, will not be able to attend at this time please *email* comp50WD@gmail.com *by March 18th* with your conflict. Teams will bring their final device prototypes and demo them to a group of makers at the Asylum. Asylum Makers and course staff will evaluate your device's form, functionality, and innovativeness at this time. Your final deliverables will be due the following day (5/6) at 5:00pm.