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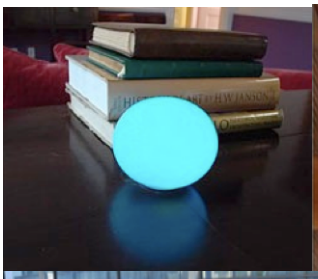
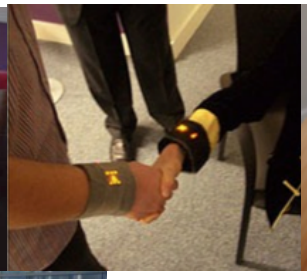
Individual Report

This course has been a great learning experience for me because I came into it with little understanding of building digital systems. My only skills were with fabrication and 3D rendering with Rhino. I have never heard of Ardiuno before we started working with it and am very pleased we did as well. It opened me up to a whole new world of interactivity because I've only created visuals systems through computer software. My previous experience with Processing came into play when it was time to figure out the code to program the board. It is relatively similar to that programming language, so I didn't feel disheartened at what I was doing. The practicals sincerely became valuable to learn the microcontroller and the potential it has to build interactive objects or environments.

In class we went over 4 types of digital systems: ambient, wearable, art, and public displays. They each have different purposes and target specific audiences. Ambient systems are embedded into our everyday tasks and sit there in the background when the user needs quick information. These systems have one simple purpose and are easily comprehensible like the colored globe we observed that changes colors to portray fluctuating data (weather, stock prices, etc.). Wearable systems are important for users as they enhance our daily activities. The system has to be sleek and beneficial at the same time because they would serve no purpose if it were heavy and bulky. We often see these types of systems encoded into clothing. An example of this is through the armband that transfers contact information in which we looked at earlier this semester. Art systems are helpful for driving our communication and expression. Art can be done more efficiently with the help of these types of systems. A useful tool in creating art is the machine that can sketch faces using a video sensor, which determines the outline and shadows of the face. The last systems are public displays that are found in public environments. Usually they are playful and are aware of the space around. Users can move and interact with the screen or system while everyone in the space contributes to the feedback it

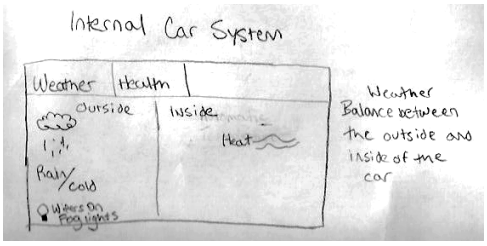
presents. One particular example is the large touch screen we looked at that is placed within a workplace where users can check how well the company is doing and gather valuable data. The system supports multiple users at one time.

The process of building digital systems is a complex process and has many questions to consider. The procedure starts with brainstorming ideas for the system you want to build. What will it be used for and how will it be used is the first area to look at. What environment will it also be placed in whether that be an office, outdoors in a park, on the side of a building, or in a home. This is key because it will determine the type of people that will interact with the system and have to be adjusted based on their needs and purposes. Once the purpose of the system has been figured out, the next process is to design and plan out the system on paper or on computer software. How big or small will it be, what materials are needed, and how will it look overall? Once the fundamental questions have been determined it is then time to design the system and actually construct it based on all of the outlines.

In our final project we had to brainstorm ideas for new technology that we could place into the car in order to prepare the driver and car for the unexpected. This answers the first inquiries noted above. The system will be placed in a car to help drivers become more prepared while on the road. My group came up with a wide range of ideas but wanted to keep it simple with little input for the driver, as it becomes a safety concern while he or she is driving. We threw out concepts at first that could possibly be built into existing systems in the car like GPS and weather information.

We originally wanted to create an app for a mobile device that could be incorporated into the map feature and give regular updates as changes occur. The user could then organize their trip before they even got in the car and know how everything will turn out based on real-time data. For this project, it wasn't a reliable idea, so we went back to the drawing board and thought up of more ideas. We looked at the Arduino furthermore and decided to build a system around this instrument we've come to understand over the semester. With that in mind, we approached a model that used lights to warn the driver of what part of the car needs attention. Tire pressure, oil change and the headlights were the main aspects of the design. These are common issues with drivers in our world today. Drivers usually forget to turn on their headlights or they never check the oil levels and tire pressures of their car. Believe it or not, most people don't even know how to check their oil and let alone their tire pressure anyways. All three of these could be programmed on this board and easily incorporate feedback with lights that anyone could understand. It's as easy as reading streetlights. An ambient system would be most effective in a car. The driver could stay up to date with any issues occurring in the car no matter what knowledge they have with cars.



Our main focus of this project was to have a working system, then worry about how it will look. However, I know that with any system, it needs to be engaging as well as look presentable. A user's first glance at the system will determine if they want to interact with it or not. Aesthetics are just as important as how innovated the system is. Consumers are going to want a system that looks good just as well as it performs. We initially planned on placing the Arduino board inside a toy car. This way we could give users a model of how the system will function based on a smaller level that you could

physically see. Our future plan is to position it in the dashboard of a car. As we finished up wiring all the parts, we came to the conclusion that placing it inside a toy car would be hard to do. The board had so many bits and LEDs sticking out that it would become nearly impossible for use to place each part where we wanted it in the car because we would have to solder a mass amount of parts to fit. The working Arduino board and code became sufficient enough, along with a simple demonstration, to give our audience a simple working prototype of what we are trying to achieve. The images we created in Photoshop help display our system as well.

After completing the project, my mind has become much more open to design and the types of processes that go into building digital systems. Many questions have to be looked into and answered before the development of the system can begin. I have absorbed what contributes to an effective system and the systems that have epically failed because of poor design. This gives me a much more open appreciation of systems in our world, and I will take the information that I obtained in this course to achieve higher success in the future.