Project Recap

Genocide happens today, despite the good faith efforts of governments and international law enforcement organizations and agencies. Many of the human atrocities and crimes against humanity occurring in the world go virtually undetected, without witness, in remote “third world” locations. Once the crimes have been committed, and the media or the rest of the world are allowed access, we see only evidence of mass graves, and the destruction that took place. We see victims, destroyed families, villages, and communities. In the “third world” locations where these atrocities take place, cameras, video cameras, and audio recorders are difficult if not impossible to acquire. These devices are expensive, bulky, and complicated to use depending on the technical knowledge of the user, which is likely not very high. At the moment, there is no means of easily identifying the individuals responsible for these mass murders and other atrocities and sequentially enforcing the law while also acting in time to save the lives of innocent people. The Power of One Device aims to solve this problem.

The Power of One Device (See above figure) is a digital image transmitter that uses the latest technological advances in communication and global positioning systems in an economical device simple enough for anyone to use. The distribution and use of this device during major threats scenarios such as genocides or even natural disasters will allow authorities to automatically match visual evidence with geographical location allowing for prompt response.

Since the scope of the design of this project is so large, our team decided to shrink the design down to a project that could be completed in one semester, with the hope that future semesters will work to incorporate all of the features of the Power of One Device. To do this, our team planned on designing a device that would capture an image, send the image to digital memory, add a location stamp to the image, and wirelessly send the image and location stamp to a nearby computer or laptop. Once these objectives were formed, we were ready to order components that would be in the design.

The components that were used in our design were researched and decided upon by the team. The microcontroller (Freescale Semiconductor - DEMOQE128) was used to control the processes of all the other components within the device. The camera module (OmniVision Technologies Inc. - OV02655) was included to capture the image that is displayed on the lens. The GPS module (Futurlec – EM-410) was used to add the location stamp of the device to the image data. The memory chip (SST - SST39VF020) was used to store the image and location stamp within the device while the device was establishing communication with the Bluetooth module. The Bluetooth module (Multitech - MTS2BTSMI-L) was included to take the image and location stamp information and send it wirelessly to a computer or laptop. Once we had our parts, we began testing and debugging the components and overall design.

The testing and debugging of our components and device turned out to be very unsuccessful. We began by programming the microcontroller to turn on an LED when a pushbutton was depressed. We then connected the memory to the microcontroller to see if they would communicate with each other, however, they would not send/receive the correct data. Our plan was then to not include the memory and use the microcontroller to store the image. We then worked with the camera module to have it capture the image and store it as a JPEG file, however we were delayed in doing this due to the lack of datasheets sent by the vendor. This greatly set us back in the project since we had planned on getting the microcontroller and camera module working together and then adding the remaining components. We finally did receive the camera module data sheets during week before the design showcase, so it was impossible for us to integrate it with the microcontroller. Because of this, we were also unable to add the remaining components (Bluetooth, GPS) to what we had working.

After experiencing so many problems during the testing of our components and device, we compiled a number of suggestions for the future teams of the project. One of these suggestions is to order parts early so that there will be a lot of time for testing/debugging. The second suggestion is to find an expert in the field who can be consulted for technical issues throughout the project. Our contact towards the end of the semester was Professor Kyusum Choi in the Computer Engineering department. Another suggestion we had is to upgrade the microcontroller to a microprocessor (model number ARM 1176), which has a faster clock rating than the microcontroller that we used.