Progress Report

Introduction:

Students' irregular attendance is a source of concern for most educational institutions. This was the motivation behind this project. The main idea of the RFID and face recognition base attendance system is tracking students' attendance. Over the past few weeks, Secure Com Solutions made substantial progress in the completion of a prototype of the automatic attendance system. This report details the progress of our project.

Schedule:

Based on the Gantt chart dedicated for this project, we were supposed to be integrating the software and the hardware parts. However, we still believe that the project will meet the final deadline since we left enough time at the end for any unexpected problem. This also can reduce the final testing time, since enough units testing has already been conducted.

Subsystems Progress:

Hardware:

The RFID circuit of this project consists of the power supply; the 125 kHz square wave carrier frequency clock generator, the antenna driver, the antenna, the envelope detector and filters, and the microcontroller. The clock generator, the antenna module, the module and the microcontroller have been assembled on a solder-less breadboard with wires connecting to the power supply in the lab. The clock generator generated a 125 kHz square wave, but there is some noise around 2 kHz in the signal. We can view a 125 kHz sinusoid wave at the end of the antenna driver. The antenna captured the FSK encoded waveform returning from the tag if the tag is placed within 5 cm. At the output of the envelope detector and filters, we get rid of any high frequency noise and 125 kHz carrier. We can view the 12.5 kHz and 15.6 kHz frequencies, which contains the useful data, out of the filters. We use the ISCP (In Circuit Serial Programming) port connect the microcontroller to the computer.

Software:

The software part of this project consists of three main parts: camera, application and the database. At this stage we have been able to read a picture form the camera connected to the computer through a USB. Moreover, we made a good progress in the application part which is the most challenging. A face detection technique was applied when capturing the picture from the camera. Also, an algorithm was implemented and tested to compare the captured picture to the existing ones. For testing purposes, the

program outputs the name of the person under the face detected after comparison. The algorithm is not as powerful as expected; however, it is still working properly for more than 75% of the time.

Future Plan and Action Items:

Hardware:

We will add an active high pass filter between the clock generator and the antenna driver to filter out the noise around 2 kHz. If the filter does not work, we may generate the square wave using the microcontroller. We will also add the power supply circuit, which we already designed, to the circuit so that the whole RFID circuit is powered by batteries. We will add a toggle switch to our circuit so we can save power. If time permits, we may modify the antenna driver to increase the reading range to meet our function specification, and also create a GUI (Graphical User Interface) to use the data coming from the microcontroller for comparison to the student's data base.

Software:

For the software part, we believe that more tuning needs to be conducted to make the algorithm more robust and accurate. At the same time, we will be working on the database part. MySQL database management system will be used since it is an open source and the team has an adequate knowledge about it. Furthermore, we will take care of the GUI part by making an easy to use application with feedback to reduce the complexity of the product.

Throughout the coming one to two weeks, the database will be integrated to the software part, the hardware implementation will be ready and unit testing will be exhausted. The integration of the two main parts will be done shortly after this and the project will hopefully be working at least four to five days before the demo day. To make up for the time lost, the team members showed willingness to work harder and put more effort into this project.

Budget:

Table 1 Budget

Component	Price
Microcontroller PIC 16F88	$6.00
USB PIC Programmer	$34.95
Magnet wire 24 AWG	$6.40
Battery holder	$8.94
Power toggle switch	$7.09
Total	$63.38

As listed above the actual expenditure is higher than the expected one with almost 20% increase. However, the total amount is still affordable and within the expected range.

Human Resources:

Secure Com Solutions team has done a good teamwork for the past few weeks. We were committed to the weekly meeting to keep track of the progress of the work. During the meetings, we discuss the developments and issues of each group members. We also communicate through Trello and Dropbox to keep track of all updated documents.

Conclusion:

To conclude most of the goals set at this stage have been met. We believe that the implementation phase was longer than what we expected. However, we will apply our action items to compensate for the time lost. And we are confident that the project will meet the deadline.