CUSTOMER RESEARCH: Group 16(Face Identification based Attendance System)

Background:

Currently there are three main types of attendance system used.

1)**Manual attendance systems**:

These kind of attendance systems are manual based where the responsible person(supervisor) would manually make sure the populous he/she is checking is present by manually calling out the names or visually making sure the person's presence. These kind of attendance systems needs manual labour and there is lways a resource involved to check on the populous. This type systems also involve possibility of manual error.

2)**Tag based Attendance systems**:

This is kind of systems were first of the automated systems. Each of the person would have unique ID tag which would be linked to his identity (Roll no/Employee ID). Here a person would use RFID based tags to manually register his attendance, the system would have a database which would be updated as the person registers his/her tag. These kinds of methods can be also used to check identification-based entry to the restricted areas. Even though these systems are automated they and they are not error prone but the systems can be easily cheated as the TAG is used as identity .Here there is possibility that the person is registered as present in the database even when he is not present(Friend can swipe his card to register).Secondly the person has to manually register himself near the tag and carry and preserve the tags.

3)**Biometric based attendance systems:**

These are similar to tag-based system but the way how person registers himself in the attendance is different. These systems use biometric finger prints to register himself in the attendance. These systems are difficult to cheat as each person would have its own fingerprint. But these still have the problem that the user has to manually register himself on the attendance system. The hardware system for this kind of system is costly and thus its difficult to scale. Imagine there is just one biometric machine and there 300plus standing in line to punch in the machines. It would take a lot of time for people to enter as this system is not scalable.

Market study:

Most of the face-based identification system are growing in china. Thus, we did a superficial study of how the Chinese market are doing currently in terms facial recognition. (1) Market size of face recognition industry: In the industry, another view is that the market size of the face recognition industry in 2012 was 1.67 billion. In 2015, the industry scale will reach 7.5 billion. By 2018, the market size of the industry will exceed 10 billion. Up to 100 billion.

(2) Face recognition industry market scale promotion path: With the urgent need for online identity authentication and user habits, the application scenario of face recognition will increase. Considering the factors such as security upgrade, online identity authentication and Internet innovation application, the market size will reach 100 billion yuan in the future.
(3). Market size of face recognition industry: According to the development status of the face recognition industry, it is estimated that the size of the face recognition market in China accounts for about 10% of the global market. In 2010-2016, the size of China's face recognition market has increased year by year, with an average annual compound growth rate of 27%. In 2016, the market size of China's face recognition industry was about 1.725 billion, a year-on-year increase of 27.79%, and the growth rate increased by 4.64 percentage points over the previous year.

Case studies:

After doing the market research we also did case studies which involved subjects which were involved in attendance-based systems such as professors and supervisors. Below we present two such cases studies from different professions and how our product would impact them. These studies were question answer-based format.

Case Study 1:

Dr. Dewan Ahmed,
Teaching Assistant Professor, Computer Science
University of North Carolina at Charlotte

The current attendance system consists of every student signing on a sheet of paper against their names where the sheet is passed around to each student. The faculty should have proper method to verify and maintain the students record especially in classes attended by large number of students. So, to lessen the administrative burden from faculty, we have proposed the automated attendance system which recognize the human face and extract some key features and proceeds to mark the attendance.

So, we talk with some of the professors and shared our idea with them. We asked them couple of questions as follows,

1. What are the issues with the current attendance system?
   - The main reason as to why attendance is taken to account for the student participation in the lecture. But some students are silent, so that's taking attendance becomes mandatory.
   - Now because there are points for attendance, we land in issues of credibility where a student may sign for his/her friend leading to malpractice.
   - If we assign some points for attendance and we have paper on which names are written, then its time-consuming task to enter those in the system.

- Some people are present in the class, but they miss to mark the attendance.

2. How would a Facial Recognition attendance system alleviate this problem for you?
   - When the student signs on a sheet, that attendance again has to be entered into the student portal online manually. This is again a time-consuming process.
     But a facial recognition system can directly take a live stream of students entering the class and the attendance gets updated simultaneously. This saves on a lot of time, effort and accounts for credibility.
   - This will eliminate the buddy punching
   - We can track the time of the student in class.

3. Would you use the facial recognition system to mark attendance?
   - Yes, as long as it doesn't require a huge database and is convenient for set up and operation, I would use the product.
   - Depends on what type of class it is. Some classes do not require attendance. Some classes require online presence instead of physical presence.

4. How would you like us to better the product?
   - The idea presented seems like it will a very high success rate, but if it were as convenient as taking picture and marking the faces to the student roll, then the product would be a huge success.
   - If the proposed system compares the time of the class and the time student present in the class, then that will give more accuracy

5. Would you recommend this application to your peers and colleagues?
   - If they too face the same issues, I would highly recommend this system to them.

6. What are their pain points?
   - Our group project is that face recognition technology is applied to the attendance system, which can make full use of the existing face database resources to verify identity more intuitively and conveniently. However, the actual face recognition attendance system will also face some challenges, such as lighting conditions, face gestures, face ornaments and other changes need to be compensated by artificial intelligence. To this end, our project is focus on face recognition technology used in the attendance system.

Case study 2:

Althea Cook.
Facilities Management BES Zone Supervisor. EPIC UNCCC.

1. What is your current attendance system?
   We are using Biometric Based system.

2. What are the issues with the current attendance system?
   Cannot track the people properly, once they are punched in for the day they can stay away from the work. I don't have an actual number of how much time they did work. Sometimes people have to wait for long to punch in even after they arrived to work at time.

3. How would a Facial Recognition attendance system alleviate this problem for you?
   - Would reduce the chaos created at the punch-in time.
   - If we can track the people I cam find how efficiently they do the work.

4. Would you use the facial recognition system to mark attendance?
   - Yes, as long as it doesn't require a huge database and is convenient for set up and operation, I would use the product.

5. How would you like us to better the product?
   - If the product provided us with tracking of the human resources also then it would be helpful

6. Would you recommend this application to your peers and colleagues?
   - Yes

Competitors

Face recognition technology is becoming the next wave of technology in the IT industry. Many well-known companies at home and abroad are actively deploying this field, especially Tencent and Ali. In the face recognition technology, the core technology is the algorithm, so the accuracy of the algorithm largely represents the technical level of a corporate face recognition.
Our customer will be the individual for now. Since we are still thinking about this.