Teaching Junior Student to develop an Artificial Intelligence (A.I.) Baby Monitoring System

Community Partner: Lok Sin Tong Yu Kan Hing Secondary School

The STEMest - Group 7

Project Introduction

Students were asked to make use of artificial intelligence (A.I.) to contribute to society and to solve the problems in our daily life with applied cutting-edge techniques. As Lok Sin Tong Yu Kan Hing Secondary school is developing the STEM education for Form 3 students, for the purpose of serving society in futuristic and technological ways, 10 secondary students were involved in this project to develop the system with the aids of Google AIY kits, and A.I. Google Cloud system, along with a user-friendly mobile application. Students practiced the ability of hand-making, coding and cooperation in this project and finally they made a product by themselves.

More narrowly, the product is an A.I. baby monitoring system, which is called "baby nanny", using the Google Voice Kit and Raspberry Pi. It takes pictures of the baby and records the voice in baby room, then uploads this information to google service automatically. The service analyzes the information for knowing the baby's emotion and tells the nanny what to do next. The nanny can be commanded to play a nursery rhyme for the baby when it finds the baby is crying. If the nursery rhyme does not work, nanny can notice the parents by the mobile app to look for the help from parents. This project dimension is to face the public, which is open to every client who has babies and cribs
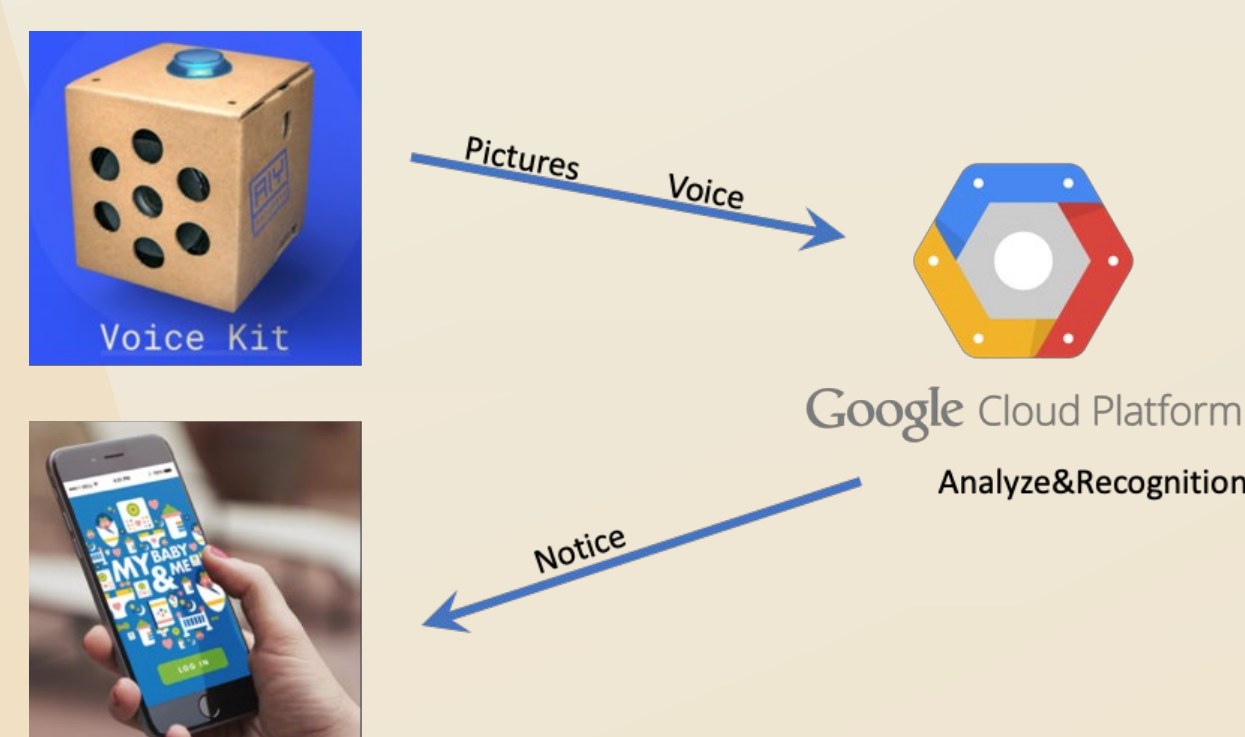
Design Rationale

News:薄被蓋頭半歲男嬰昏迷 送院不治
https://hk.on.cc/hk/bkn/cnt/news/20190412/bkn-20190412074612375-0412_00822_001.html

- How do we apply STEM elements to prevent this problem...?

- How about we develop a baby monitoring system for our parents?

The answer is yes!

Our project aims to provide a baby monitoring system to monitor and report to parents in an emergency.

There is a visual monitor connecting to Google Cloud placed in the crib. When the baby is at risk, say being covered by a blanket, the emergency reporting system will immediately notify the parent via the mobile app. Parents will notice if the baby is safe or not in real time. For the same reason, the system can also be suitable for situations, such as solitary elders have accidents without any instantaneous helps from the significant others and cannot report to the police under all circumstances.

Limitation and difficulties

For our groupmates: In our group, there are at least two group mates know nothing about coding. However, this is a project, which is based on python and app inventor. So we have to learn those new things in a hurry time and teach them to the students in an easy understanding way.

For Google kit: Nowadays, Google Cloud's Vision API offers powerful pre-trained machine learning models. It can recognize objects, faces, colors, languages and so on, even can talk with you. But crying is a sound, not a language. It is pretty difficult for the Google kit to catch the sound and analyze it.

For collaboration with the school: We had a pleasant cooperation with Lok Sin Tong Yu Kan Hing Secondary school. Our partner selected 11 students to take part in our program. It is a pity that we only had 2 lessons because of the time clash so that we cannot complete our plan.

Individual Reflections

In this project, we encounter a valuable opportunity to participate as a student-teacher in the local secondary school. We found that it is very important to introduce STEM element to the students nowadays because they are facing a dynamic future which is technology everywhere. Moreover, as the artificial intelligent eras are coming, the lessons we have taught illustrate a good concept and demonstrate a good example of how to elaborate on the application of AI concept to the form two secondary school student.

Conclusion and Recommendations

Throughout several workshops of teaching students simple knowledge of coding and a glimpse of Internet of Things, they are furnished with basic picture of how technology can change their living habits in the coming future. Combining with what they have already learnt in this school of STEM education pioneer, they are pinned with high hopes to use advanced technology to serve the community.

Regarding the recommendations, we conclude the target audience can be enlarged. This baby monitoring system can be transform to be a bigger house managing system. Not only does it look after the baby, but also serves different other age group people like the elderly as mentioned before, and notifying the house owner once the house or the flat is broken in. However, this requires a larger database for AI facial recognition, presuming different scenarios that might be encountered and if so we might not have enough time to carry out the project.

Students, the future ridgepole, are taught to handle a complete and mature healthcare and safety warning system. For one thing, it helps numerous busy parents; for another thing, it directly raises the sense of belongings to the community of students, allowing to better connect with society and to make more tailor-made products later for the whole sake.