Remote control of robots on mobile device

through two way video chatting to
direct movement and communicate

For iOS devices

Milestones

7 days  Build basic iOS application with user interfaces
10 days Build online video chatting application in Java or Adobe Air
7 days Embed the video chatting feature
10 days Set up remote control of robot for the application by button
10 days Set up remote control by pointing at image
14 days Testing and Debugging

Short Description

This project aims to develop an iOS application that turns an iPhone to a remote control to specific robots. This application would enables user to access robot’s camera’s video stream by embedding the two-way video chatting feature. User can direct the movement by either using the direction buttons or pointing on the video image.

Advantages of iOS mobile devices

⭐️ easy to carry around ⭐️ long battery life ⭐️ more network options ⭐️ Multi-touch gesture function
Motivation

Compare to traditional computers, iOS devices such as iPhone and iPad have the advantage of much lighter. One iPhone only weighs 0.137g and an iPad weighs 0.6g. However, a typical laptop’s weight is 2.37kg. Other features include battery life and 3G network.

People have developed many different programs for computers to control robots remotely. These programs broaden the usage of robots both in working environment and at home. In addition, graphs above show that the growing popularity both in US and around the global.

And now, implementing it on the iOS platform will further expand the market of robots that features remotely control. And this project will benefit users from these mobile devices’ advantages.

who are the potential users

One major potential user is company that have employee working remotely. Instead of scheduled videoconference, employees can walk around in the office and talk to people by using this application to direct a robot.

Besides employee working remotely, companies can also direct these robots to work in dangerous or toxic environment.

Other users include parents who can use robots to watch over their children, patients that need to use wheelchair.
How should user operate and control the robot through this application?

**Four Windows:**
- Log in Window
- Main Window
- Contact List
- Connect Window

**Login In Window**
User needs an account number and its password to log in to the application.

After logging in, user will come to the main window.

**Main Window**
In the main window, user can test their camera’s video quality. They are also able to choose different cameras. User presses to connect button to start a video chatting or log out the application.

If user presses the connect button, the contact list appears.

**Contact List**
In the contact list, it includes all robots that the user has access to control.

Choosing a robot on the list, user is connecting to the robot.
How do we build it?

**Xcode:**

It is a suit of tools for developing software for Mac OS X and iOS. Xcode uses the Model-View-Controller.

**OpenTok API:**

The OpenTok API is a free and flexible cloud-based API, making it easy to add video chat to applications without having to worry about infrastructure and scale.

**Connect Window**

The robot’s camera video stream is on the top half of the window. Pointing on the video image, the robot then moves to the pointed spot.

The user’s camera video stream displays on the left down corner.

The Move/Disable button enables users to turn off the movement control of robots. Therefore, the robot can stay at a fixed place without accidental directing.

The direction buttons give users a second option of controlling movement.

User can also press End Call to disconnect.

**Conclusion**

The still-growing number of iOS mobile devices’ users indicates a larger market. Furthermore, features of mobile devices would help the application and usage of robots to expand and move forward.

This project aims to develop a two way video chatting application. Users are able to direct robots while video chatting.

This application is built using Xcode in Object-C language and open source API/Library to implement the two-way video chatting feature.