Programming An Intelligent Watch

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Summary

This project plan expounds the details of the project. First, the basic background is described and the idea about the modification of the android wear system is introduced. Second, the plan states the objectives and deliverables. Third, literature review in this plan explains the previous works on the modification of the android system and the third party ROM. Fourth, the scope part explicates what the project will include and exclude. Fifth, the methodology part illustrates the approaches that will be utilized in this project and the feasibility part justifies why the project can be achieved. Finally, the risks part declares the challenges that may be confronted in the process of the project, and the schedule of the project is listed in the plan as well.

Introduction

Figure1: The android watch.

A new android smart watch has been designed recently (Figure 1). The watch has a number of excellent hardware: hi-res, dual-core MIPS CPU, 4GB eMMC, 8GB storage, audio, camera, sensors, bluetooth, etc. The developers intend to add some extraordinary applications or watch faces to the smart watch. [1] The watch is currently running the basic android wear system which is a system running on the android watch or other android wearable devices. [2] Unlike the android system on the phones or pads, the android wear system is elementary and only has some basic functions like watch, timer, google fits and alarm. Compared to those functions of the ordinary android system, the functions supported by the wear system are not so satisfying to the users. That's why some big android watch brands have developed their own android wear systems: Samsung has Samsung Gear system and LG has G watch system. Therefore, this project aims to modify the android wear system and add more functions to it to make it in a new style. To achieve the goals, a new watch face will be designed for the system, several apps or tools will be added to the system and

some new drivers will also be added to support more sensors and other hardware.

Objectives

The project is devoted to developing an android wear system based on the Google Android Wear system and making it a more powerful and user friendly system. Although some functions like notebook are included in the current system, those functions are not so user friendly, thus those functions will still be included in the modification of the system.

Specifically, the first goal is to develop a set of basic tool applications and a watch face for the system. The applications include an input method app, an album app, a calculator app and a notebook app, most of which are commonly seen in the android phone system but usually excluded by the android wear system. And a new watch face for the system can make it look distinctive and more user-friendly.

The second goal is to develop or install some drivers into the system. The new watch has some unique sensors and some other hardware thus some special drivers are required. After the installation of the drivers, corresponding applications will be developed therewith.

Literature Review

There are not so many projects related to the android wear system modification but there exist some works about the customization of the android system. The modification can be done on the kernel, modules or apps. The apps will be developed by android programming. After the development, the app will be placed in the system packet to make it a default installed app. To support some sensors and hardware, some drivers will be added into the system kernel in the form of module. The applications will use the modules to access the hardware and realize the related functions. [3]

There are several versions of android wear system. One of the most popular android wear systems is zenwatch system. The current zenwatch system has the functions of

weather, agenda, alarm, compass, fit, translation and timer. However, the system is based on the voice control and lacks the input method. Sometimes the voice control is not the most convenient, suitable and accurate way to input words.

Scope

This project will cover the application development, watch face development and the addition of the drivers. So the android watch is supported by unique hardware configuration and user can use a series of unique applications on the watch.

This project will exclude the hardware development.

Methodology

There are two working modes of the android watch application. The first one is running the app on the phone or pad and displaying the notification on the android watch. The second one is directly running the app on the watch.

The android watch app can be developed in the same way as the android phone app by using the Activity and XML layout. The UI design will be developed by XML programming. The Activity that controls the behaviors of the app will be developed by JAVA. Moreover, some android wear apps need to send data to the phone or pad, hence the GoogleApiClient library is needed. The GoogleApiClient library can help synchronize the data between the phone and the watch. [4] After the development of the application, the apk file of the app needs to be put into the app folder in the system folder to make it a default installed app.

To add new drivers for the sensors on the watch, some modules need to be added into the kernel, so that the applications can use the modules to access those sensors. The kernel part will be developed in Linux.

Feasibility

The android wear system is an open source project of Google. Although some parts of the source code of Google service are not available to the public, the basic content of the system can be downloaded from Google. There are also some other published versions of the android wear system. Moreover, the first personal designed thirty party android wear ROM “Gohme” was released on 2014. So this project is feasible.

Risks and Challenges

The android wear system is a new android system published just one year ago. So there are not so many resources and information about the modification of the system. That’s the most significant challenge for this project.

Some unique sensors or other hardware may need some drivers, and kernel may need to be modified. Since it will include modifying the kernel part the system, it will be a huge and difficult work.

Schedule

Date	Content	Deliverable
4 Oct 2015	Study the android wear system. Decide the apps and drivers that will be used in the system. Make detailed project plan. Make a project web page.	Detailed Project Plan. Project Web Page.
Oct-Nov 2015	Develop the set of apps.	
Dec 2015	Design and develop the watch face. Prepare for the first presentation and interim report.	

Jan 2016	First presentation Preliminary implementation. Detailed interim report.	First presentation. Preliminary implementation. Detailed interim report.
Feb-Apr 2016	Install new drivers for the system and develop the corresponding apps. Finalized tested implementation Final report.	Finalized tested implementation. Final report.

Conclusion

This project is aimed at developing a set of applications and a watch face for the android watch, and also adding some drivers to the existing android wear system in order to make it to be a new customized, powerful and user friendly system. Methods of android programming and knowledge of Linux drivers will be utilized in this project. The final deliverable is an enhanced android wear system with a special watch face, some new apps as well as some other hardware drivers and their corresponding apps.

References:

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