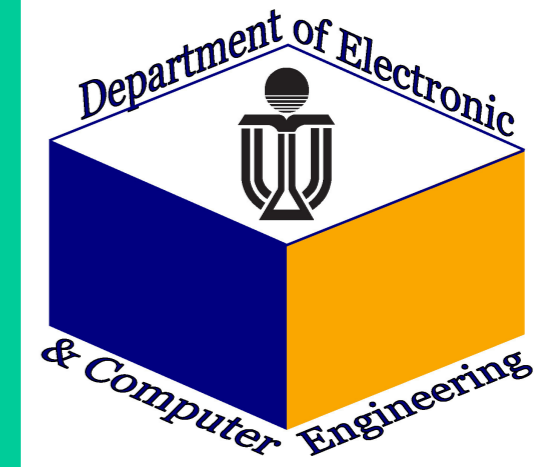


Using Smart Phone to save energy (TCY3-10)

Supervisor:
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Chan Kin Fung
Yau Hiu Lam



Overview

Introduction:

Misusing of house appliances is a very serious problem. Many power is consumed. In this final year project, the system will be developed on embedded system to achieve energy saving.

What is embedded system?

- System Specification (Functions, Real Time)
- Area
- Cost
- Portability
- Low Power (Battery Life)



Aim and Objectives

Aim

The aim of this project is to develop a system on Android device for energy saving. Fundamentally, users could control home appliances by using their mobile phones remotely. Additionally, the mobile phone is combined with different kinds of sensors such as temperature, humidity and motion. These are parameters for the Auto-control system and the system can also control home devices on the internet.

Objectives

Using a power saving system, the objective of this project is to understand the concept of the embedded system design, to learn the whole development device cycle, to analyze microprocessor architectures, to learn how to write hardware drivers on Linux kernel and applications on the AndroidOS.

On the hardware development, learning the sensors application is also an important task in this project, because different types of sensors need different connections and methods to drive the sensors and those also affect energy consumption.

Data Collection	Android	Base Server	PDU
temperature humidity position	-Display device status -User interface -Data analysis -control PDU	-Display device status -User interface -position calculation -control PDU	-return PDU status -request handling

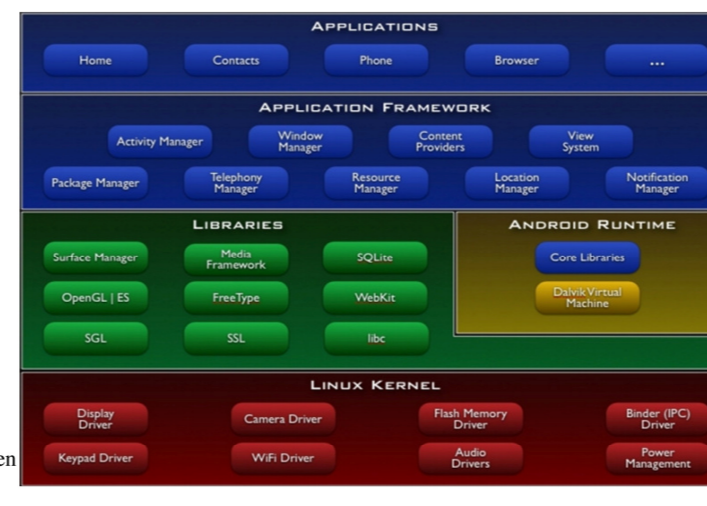
Data transmission method:

- Smartphone ← Wifi → Base controller
- Base ← Zigbee → house appliances

Methodology

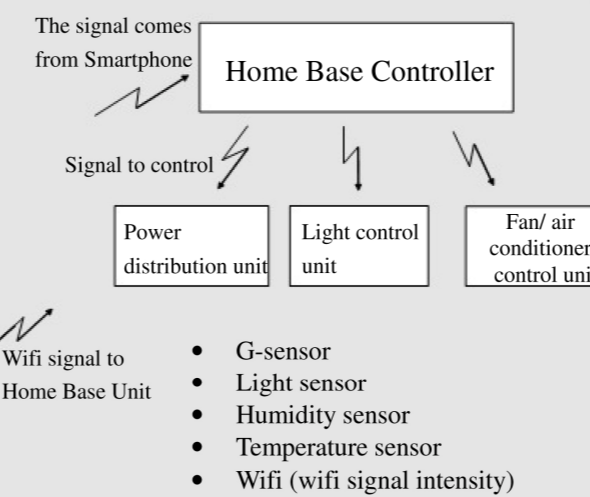
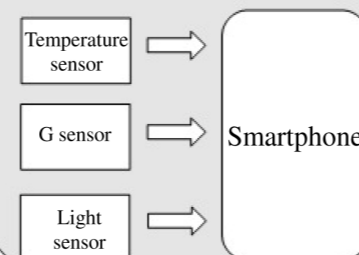
Architecture used in project:

- **Application layer**
All applications are run on this layer
- **Application Framework**
Provides a set of services and systems to build applications
- **Libraries layer**
Provides powerful libraries for development
- **Android Runtime layer**
Android application runs in its own process
- **Linux Kernel layer**
Handles communication between hardware and software



Home Base Controller:
Control all of house appliances
Collect data from smart phone
Power consuming Calculation

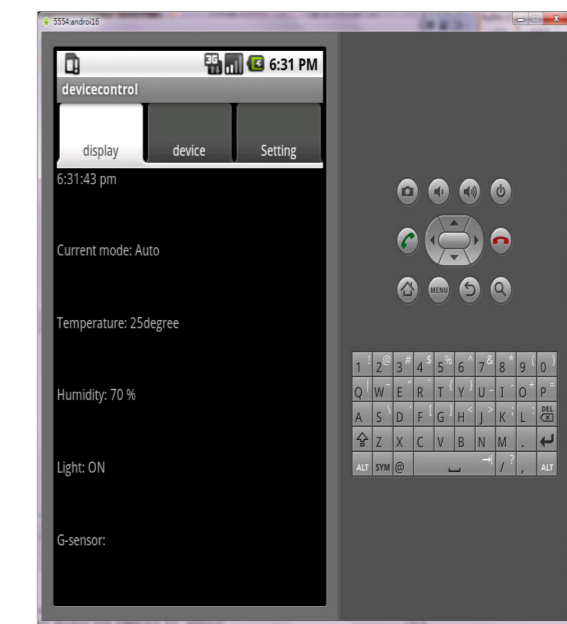
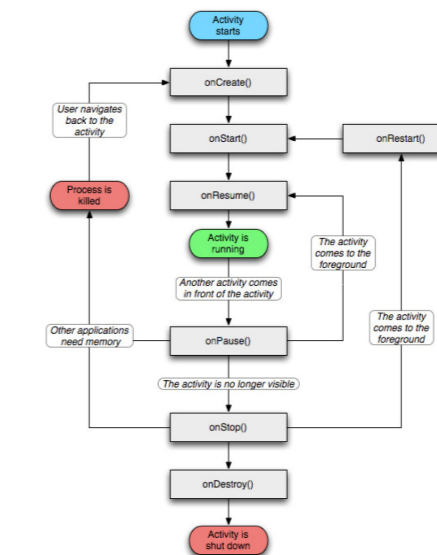
House appliances:
Return its status
Measure power consuming



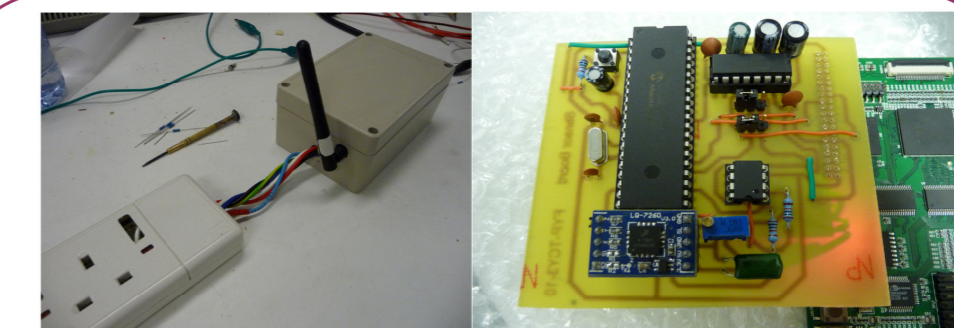
- G-sensor
- Light sensor
- Humidity sensor
- Temperature sensor
- Wifi (wifi signal intensity)

Methodology

Simulation and flowchart of Android with Eclipse



Result



The output of the project:

Top left:
Power distribution Unit

Top right:
Sensor board with g-sensor and temperature sensor

Right:
Sensor board plug in to the devkit8000 development board for Smartphone simulation.

