

Android application for easy and medical use of Wireless BCI system

yongwool@gist.ac.kr
infonet.gist.ac.kr
+82-62-715-2251

Lee Yongwoo, Lee Seungchan, Shin Younghak, Konrad Wichrowski, and Heung-No Lee*
Dept. of Information and Communications, Gwangju Institute of Science and Technology(GIST)

1. Abstract

An easy-to-use BCI system with affordable price can be widely used in geriatric and senior industry. With wireless BCI device and Android application <INFONET BCI> that are developed by INFONET, GIST School of Information and Communication, we can provide it. The system is consist of 3 parts – an EEG cap which is easy to wear, wireless BCI device with a size of credit card and an any Android device.

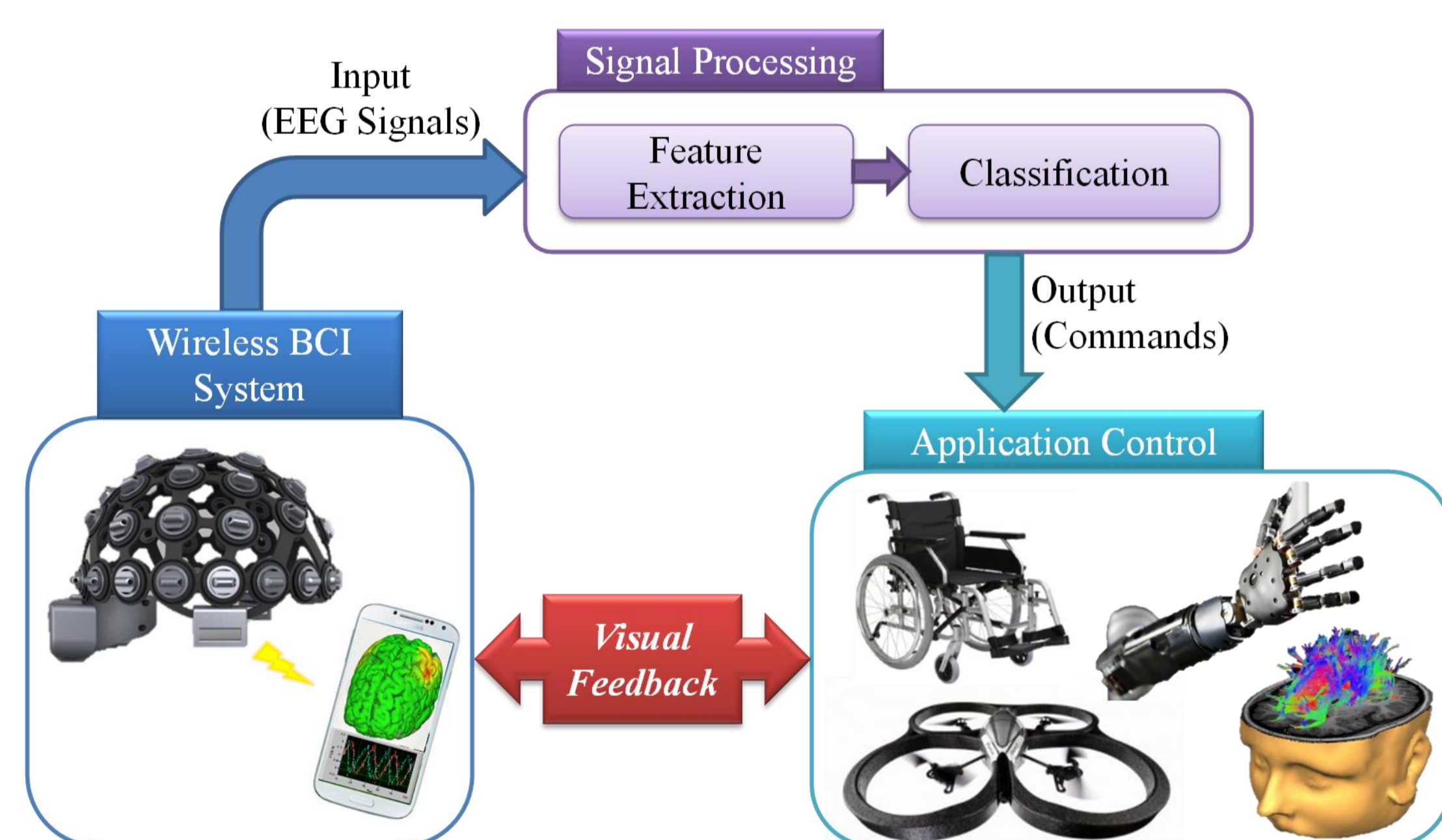
While using <INFONET BCI>, we can collect EEG data. With these big data, it is possible to find out accurate information about EEG signal of brain disease like dementia, epilepsy or apoplexy. User can easily have tested for these disease in home. It will make a contribution to early diagnosis and treatment.

<INFONET BCI> let users use Android with brain wave that is, without fingers. Therefore, <INFONET BCI> can be used not only for medical purpose but also every usage of Android. The benefits of this system is great to old people and patient who is not free to using fingers especially. We replaced the general input equipment of android – touchscreen – with EEG signal.

We accommodate using smart phone for the aged. We hope person can use android with just thinking someday. When it comes, elders do not spent time to find and familiar with functions of android, just think what they want do.

2. Introduction

Wireless BCI system



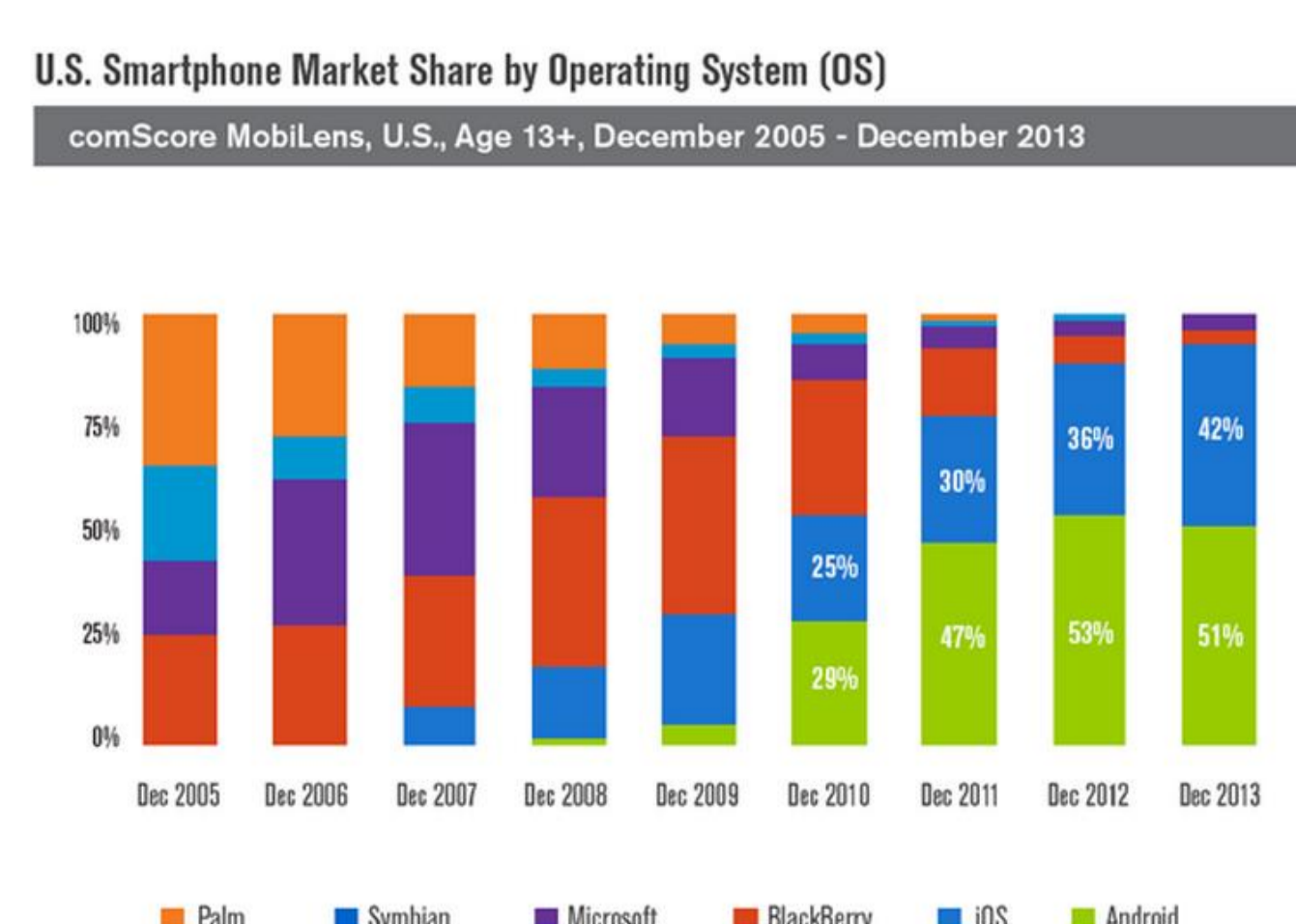
Block diagram of BCI systems

Demand for mobile BCI

- Tries at BCI as a wearable device
 - ✓ Google glass + MindWave Mobile NeuroSky
- A great combination for wireless BCI
 - ✓ The wireless BCI should be used on wireless device.
 - ✓ Mobile devices are not only wireless, but also portable.

Android as a mobile BCI platform

- High market share



3. Structure

A. INFONET Wireless BCI system



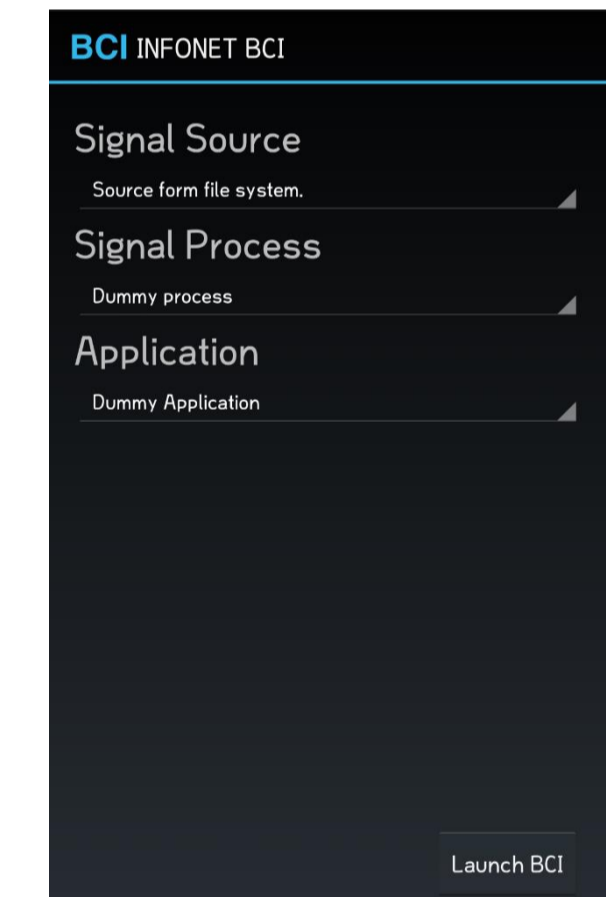
System block diagram for INFONET Wireless BCI system

B. Application Structure

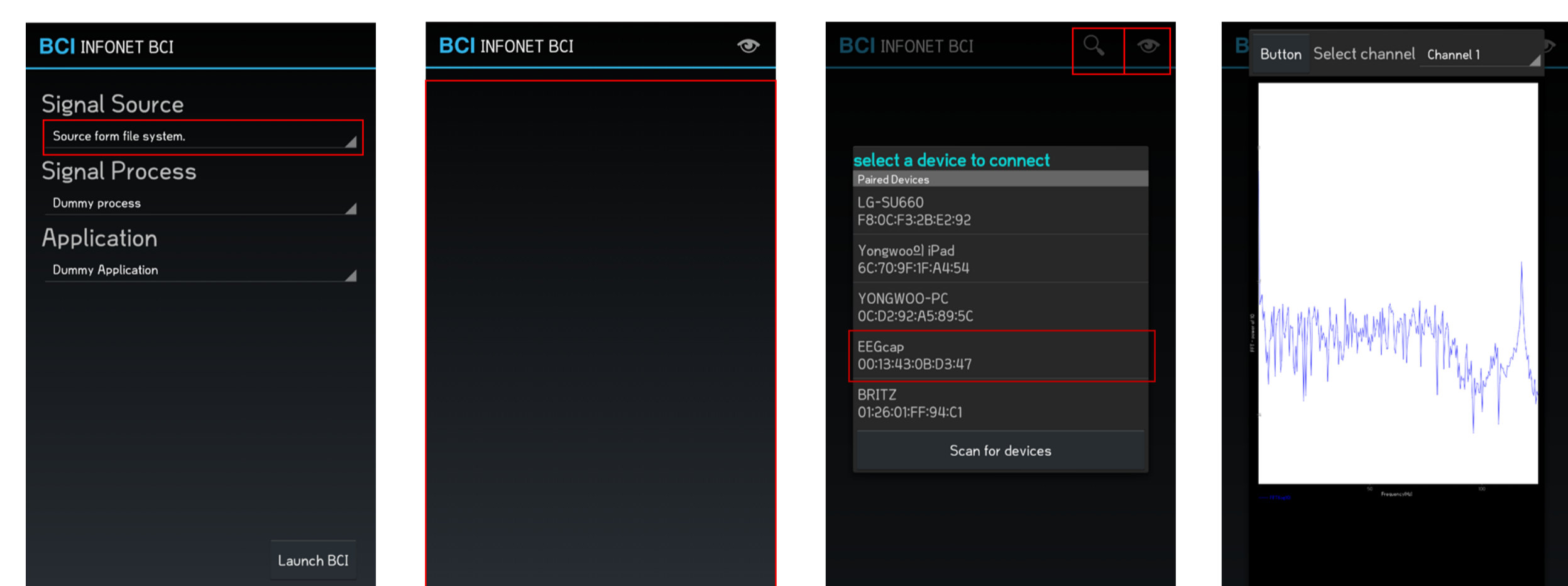
- 3 Main modules
 - Source module
 - Signal processing module
 - Application module

C. Modularized application

- Easy update - Develop additional module and adapt it is all for update
- Unlimited usage - Since it is easy to adapt new functions, It can have variable usage with updates.



D. Features



4. Future works

A. Big data of EEG signal

- We can collect EEG signal with this application.
- Big data of EEG signal will contribute BCI.

B. Much easier use of Android

- Elders are having difficulty using smart phone.
- Replace general input method with EEG signal.
- As BCI are evolved, it might possible using android with just think what user want to do.

C. Real time monitoring for patients

- Send alert to hospital and guardian when emergency occurs.

D. Anything can be done with android