

gPBL for IoT Device Analysis used in Society

Date	Place	Partner Organization	Students' Major and Grade	Participants' Information	SIT Instructor
Mar10 ~Mar27,2021	Japan	King Mongkut's University of Technology Thonburi	<ul style="list-style-type: none"> Department of Electronic Engineering Undergraduate 2nd grade Undergraduate 3rd grade Undergraduate 4th grade 	(SIT) Students 4, TA 1, Professor 3 (King Mongkut's University of Technology Thonburi) Students 4, Professor 1	YOKOI Hideki (Department of Electronic Engineering) ISHIKAWA Hiroyasu (Department of Electronic Engineering) UENO kazuyoshi (Department of Electronic Engineering)

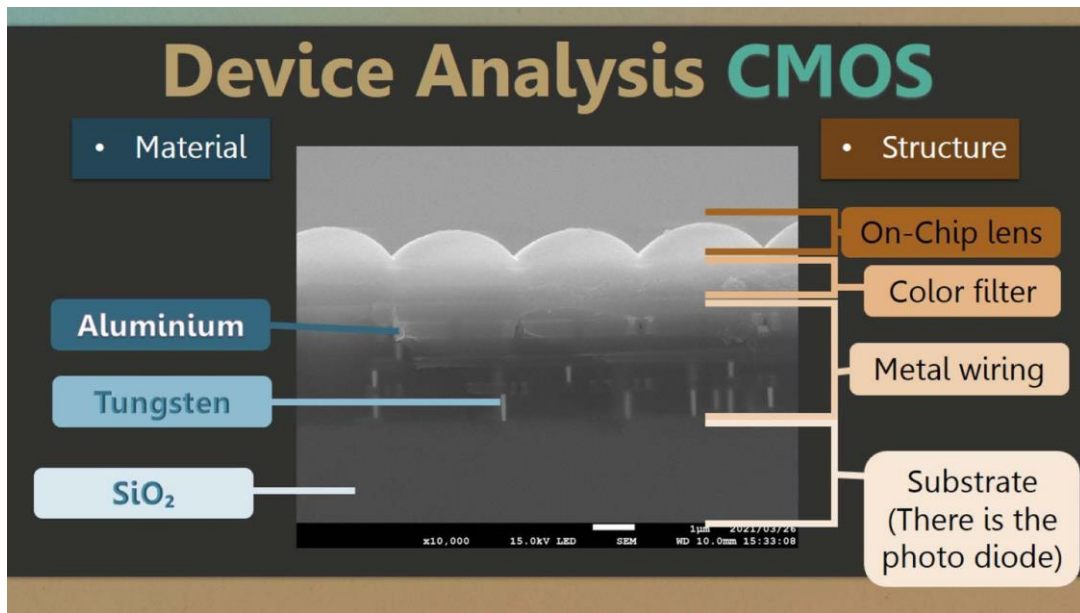


Image1 Cross-sectional device analysis of CMOS image sensor in the web-camera

Students teared down electronic products such as IoT devices used in society and investigated their functions and mechanisms. In addition, the students learned through product analysis what kind of electronic parts are used in those electronic products, what kind of functions the electronic parts have, and what kind of materials and technologies are used. Furthermore, the studensts discussed what kind of electronic products and electronic components will be needed in the future. A team of two students each from SIT and KMUTT disassembled and analyzed a webcam and a smartwatch and gave a presentation in English. Finally, they made presentations about the product analysis results.



Image2 IoT electronic products around us



Image3 Web-camera for product analysis

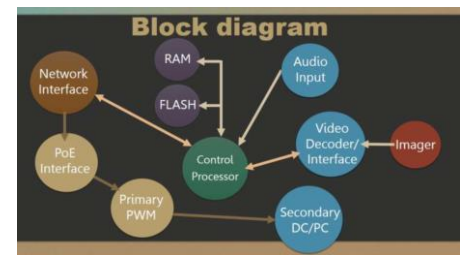


Image4 Block diagram of the web-camera (components)

1. Why we choose Galaxy fit2 smart watch?



Galaxy fit2 is a typical IoT device. It have several sensors and a main microcontroller. It can detect activities and heart rate and so on. It also have many other functions.

Reasons we choose Galaxy fit2

- There are many functions
- The price is too low compared with other brands
- It can make our life more convenience

Image5 Smart watch for product analysis

Galaxy fit 2 Product Analysis

2. Block diagram

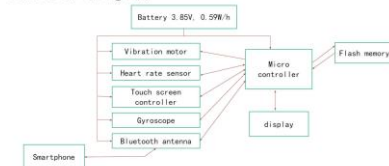


Image6 Block diagram of the smart-watch (components)

Device analysis for Galaxy fit2 (optical microscope)

5. Optical heart rate sensor

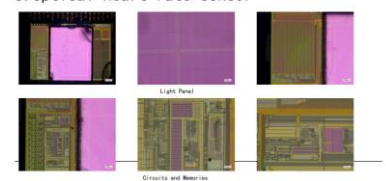


Image7 LSI chip analysis of heart-rate sensor in the smart watch