



reddot design award
winner 2017



Startup Global Maker Education



LUXROBO

CEO Oh Sang Hun



이 나라의 모든 사람들은 컴퓨터 프로그래밍을 배워야 합니다.

Introduction

We provide Robotics of Things platform for your creativity.



Winner of World – wide competition

We provide Robotics of Things platform for your creativity.



World **ROBOFEST**® Championship 2008

Second Place Performance Award
Senior Game

SANGHHUN OH

Team ID: 767-4 Team Name: HERO

April 26, 2008

Chan Sin Chung

CJ Chung, Ph. D.
Founder & Director of **ROBOFEST**
Associate Professor of Computer Science

David E. Bindschadler

David E. Bindschadler, Ph. D.
Chairperson and Associate Professor
Department of Math and Computer Science

www.robofest.net



Scholarship Certificate

Robofest 2008

Robofest \$2,000 LTU Scholarship

World Robofest Championships, April 26, 2008

Presented To: Sanghhun Oh

World Robofest Team: HERO

This is to certify that the above person has received a Robofest LTU Scholarship in the amount of \$2,000 as an annual renewable scholarship, provided the student meets LTU admission criteria and scholarship criteria of High School GPA of 3.0 or better and ACT score of 22 or better. This Scholarship is renewable each year provided the student is enrolled for a least 12 credit hours each semester and maintains a 3.00 GPA or better. Additional details about the scholarship are available in the LTU office of Admissions. If there are any questions, please contact the Office of Admissions at (248) 204-3160 or the Robofest Office at 248-204-3566. This Certificate should be saved and presented at time of enrollment. This Scholarship is non transferable; it may be combined with other Robofest Scholarships.



Chan Sin Chung

Dr. Chan Jin Chung
Director, Robofest
Lawrence Technological University
October, 2008

David E. Bindschadler

Dr. David Bindschadler
Chair, Math & Computer Science Department
College of Arts & Sciences
Lawrence Technological University
October, 2008

John M. Kugawa

John M. Kugawa
Assistant Provost for Enrollment Management
Lawrence Technological University
October, 2008

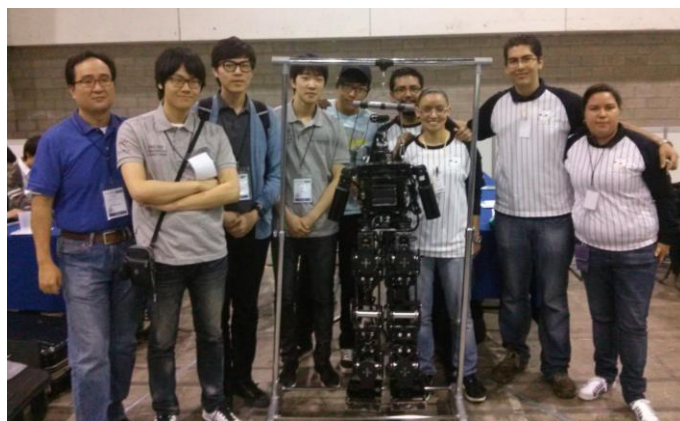
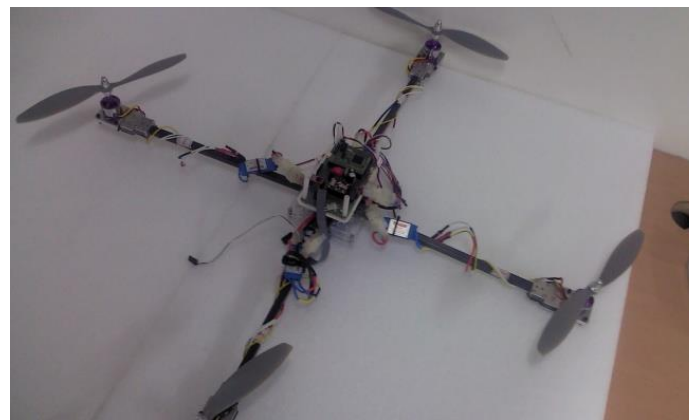
Lawrence Technological University
College of Architecture and Design | College of Arts and Sciences | College of Engineering | College of Management
21000 West Ten Mile Road, Southfield, MI 48075-1058 | 248.204.4000 p | 248.204.3727 f | ltu.edu

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국 방 과 학 연 구 소
Agency for Defense Development



HYUNDAI



LG

ETRI





Luxrobo의 시작



Why we go to School

Every single MODI modules have MCU including our own micro operating system.

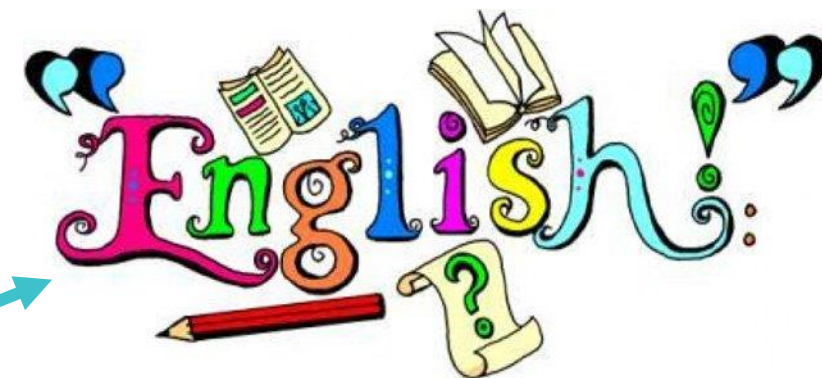
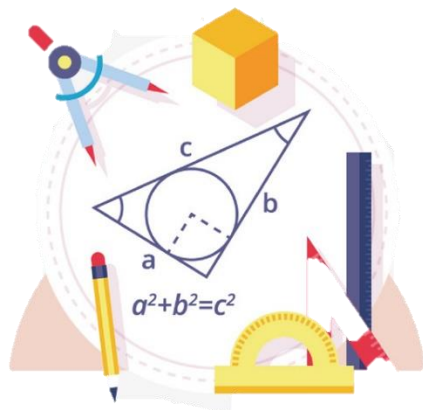
꿈을 갖고 싶다

직업을 갖고 싶다



What we study in school

Every single MODI modules have MCU including our own micro operating system.



But...

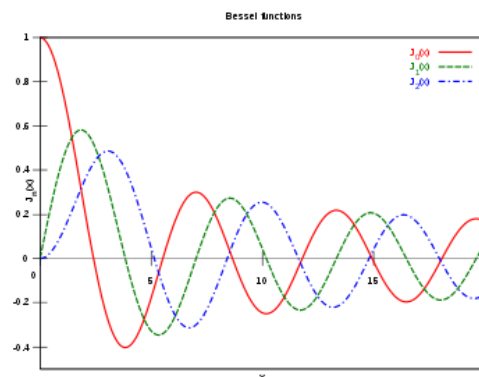
Every single MODI modules have MCU including our own micro operating system.

$$s_x = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}}$$

n = The number of data points

\bar{x} = The mean of the x_i

x_i = Each of the values of the data



$$\int x^n dx = \frac{1}{n+1} x^{n+1}$$

$$\int x^{-1} dx = \ln(x)$$

$$\int e^{ax} dx = \frac{1}{a} e^{ax}$$

$$\int x^n e^{ax} dx = \frac{1}{a} (x^n e^{ax} - n \int x^{n-1} e^{ax} dx)$$

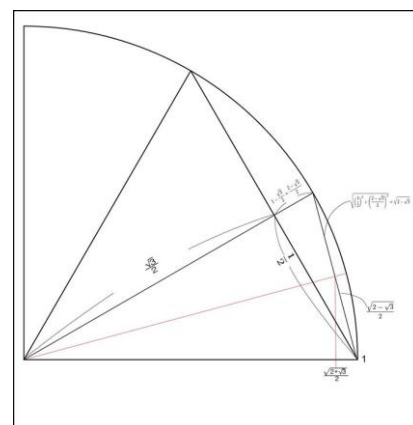
$$\int \sin(ax) dx = -\frac{1}{a} \cos(ax)$$

$$\int \cos(ax) dx = \frac{1}{a} \sin(ax)$$

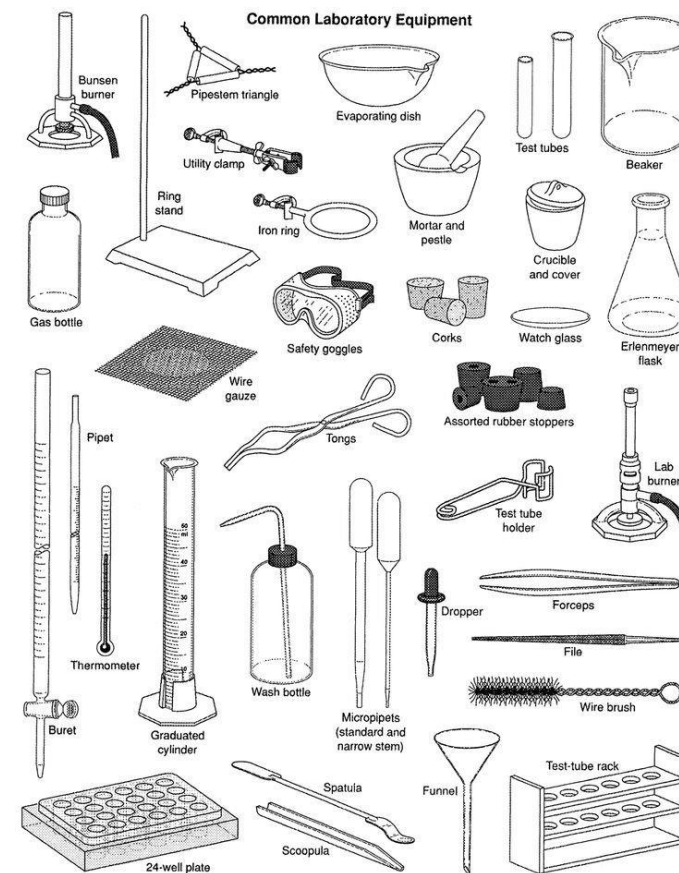
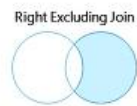
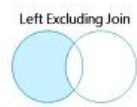
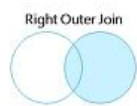
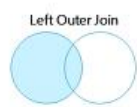
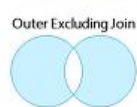
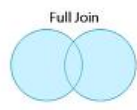
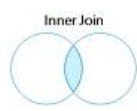
$$\int f(x) \left[\frac{dg(x)}{dx} \right] dx = f(x)g(x) - \int g(x) \left[\frac{df(x)}{dx} \right] dx$$

$$\int \frac{dx}{x^2 + a^2} = \frac{1}{a} \tan^{-1} \left(\frac{x}{a} \right)$$

$$\int \frac{dx}{a^2 - x^2} = \frac{1}{2a} \ln \left(\frac{a+x}{a-x} \right)$$



SQL JOINS



Coding education for better cognitive ability

We provide Robotics of Things platform for your creativity.



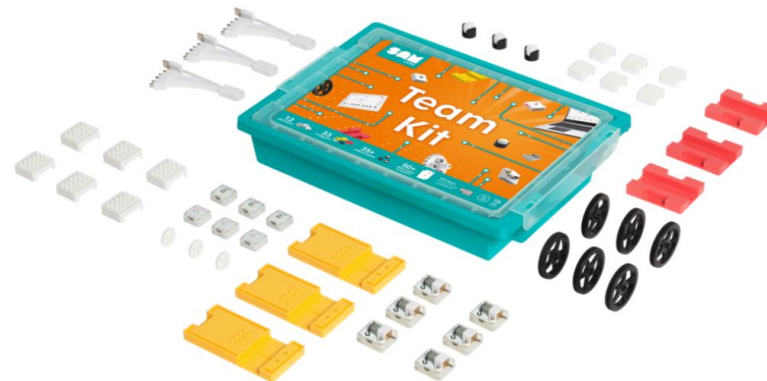


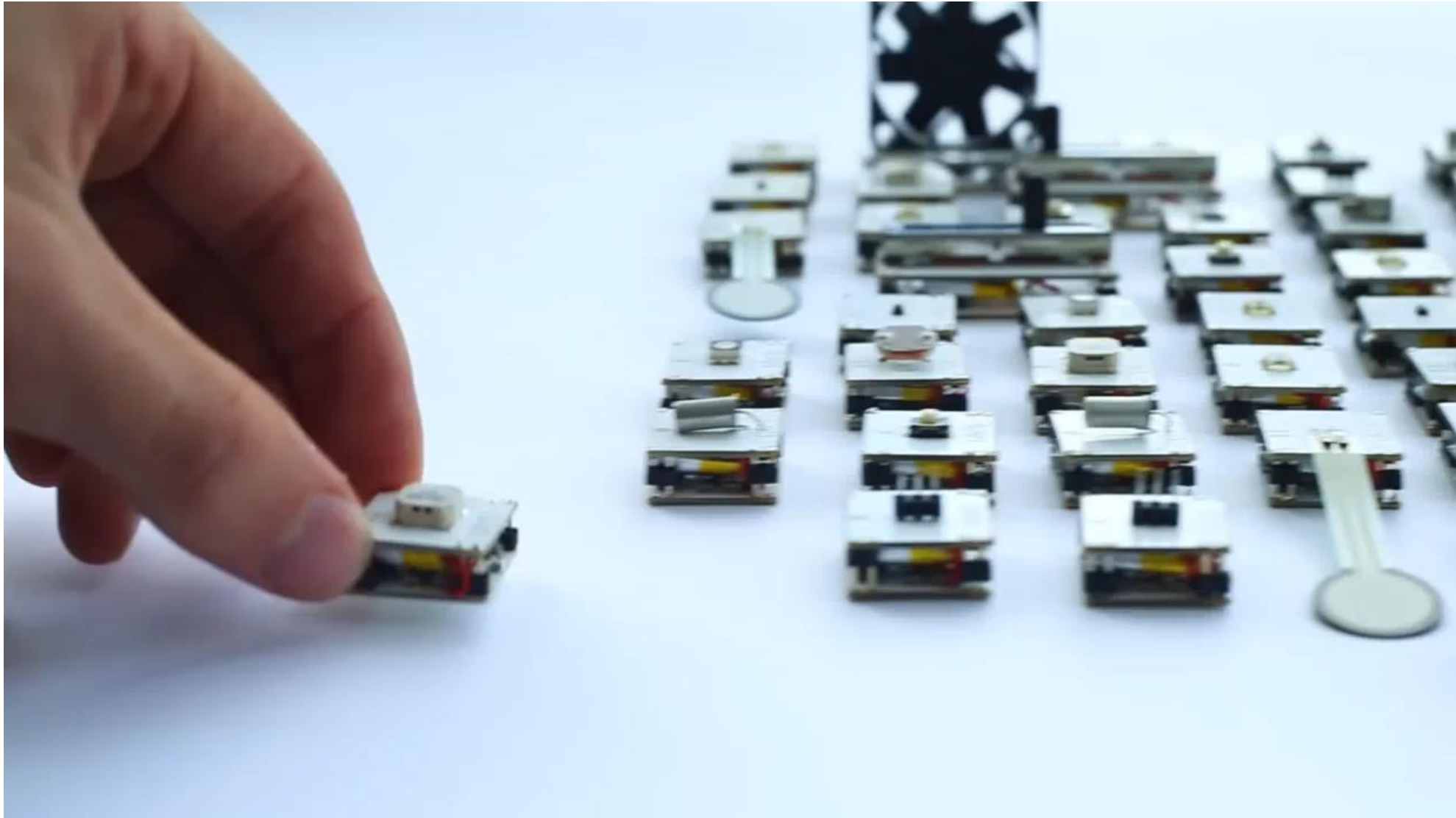
Market Competitor appendix

SAM Labs has 13 modules.

Each module is connected wirelessly and has a battery in each module.

- Every SAM Labs module can be connected to a computer via Bluetooth.
- Mobile application 'SAM Space' is intuitive.
- Each module has a battery, so only one module can be charged at a time.
- Without computer, it does not work.





Neuron has consistent size and provides various programming platform.

- Neuron modules are safe. This appeals to young age users.
- Neuron provides various coding tools such as Mblock5, mBlock Blockly, Neuron app.
- Only power module has MCU. Each module cannot control themselves.
- Modules can be connected through only two sides.



makeblock neuron

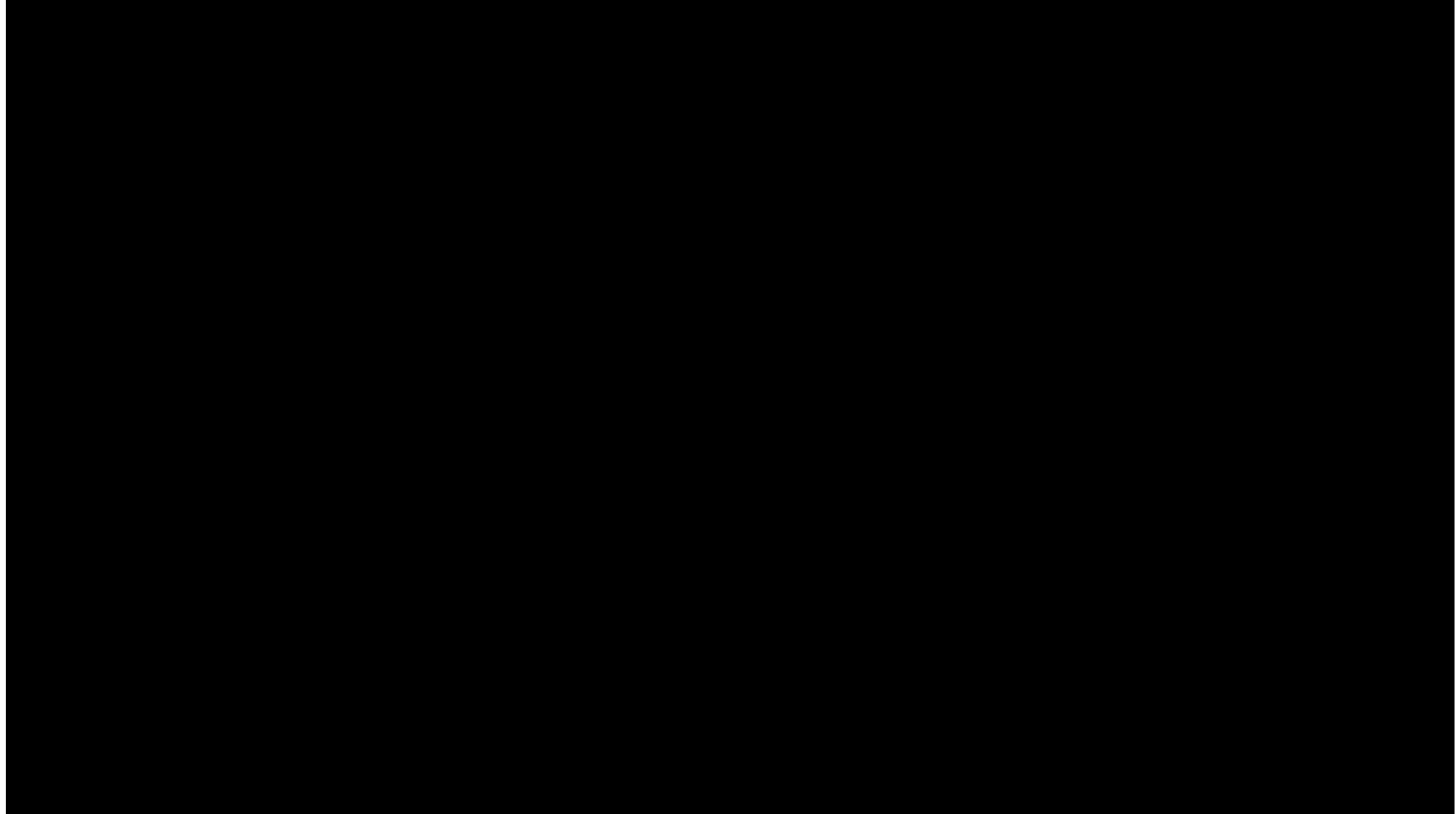
Programmable electronic building block platform



LittleBits leads module-based open source hardware platform market
modules provided by Littlebits are analogue-level.

- Little Bits is matchless open source hardware platform.
- Does not need to be connected to computer.
- Only code bit and Arduino has MCU. Each module cannot control themselves.
- Modules can be connected through only two sides.





One of market leading open source hardware platform.

- Arduino has world-wide User community.
- Users learn circuit construction and computer language at the same time.
- Targeted only high level users.
- Some sensors needs to be soldered to be connected. It can be dangerous.

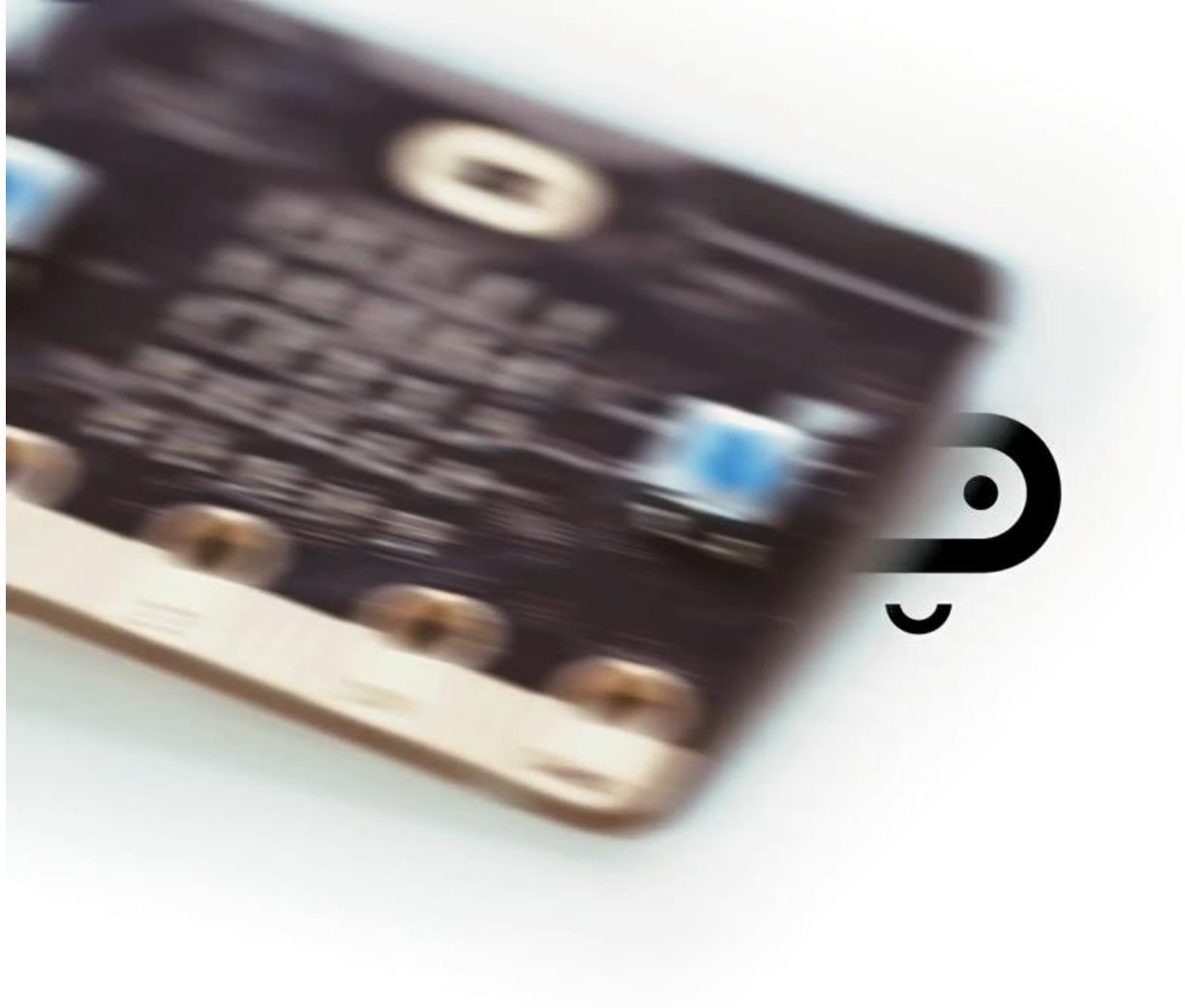


Micro bit provides various types of programming tools.

- Micro bit allows users to choose proper coding method among various options such as java script block editor, python editor.
- Much cheaper than any other software education tools.
- Only has 3 input / output rings. To connect more than 3 modules, You may need extending connector or bread board.
- Has less extendability than Arduino as a open source hardware platform.



Micro Bit



Cubroid - Coding Block

Cubroid coding block has LEGO-like hardware and safe.

- Cubroid Coding Block has High compatibility with LEGO.
- User experience is extensively focused on young age users.
- There are only 7 modules in a kit.
- Only master block can control other blocks.



Cubroid - Coding Block



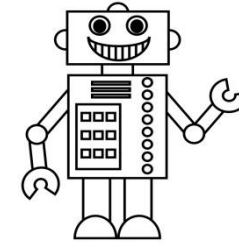
R o b o t i c s O f T h i n g s

Robot Of Things 전략

2015.09.15
제품기획

Company Vision

Life & Robotics



생활 속의 로봇을 꿈꾸다...

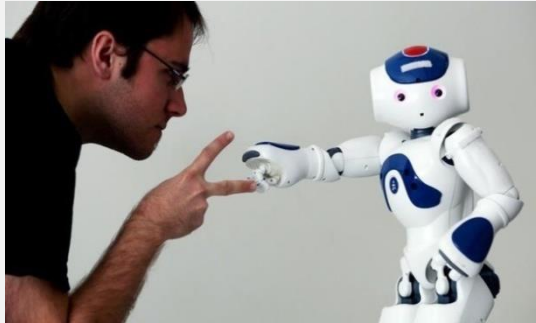


Robot of Things

Life & Robotics

Robotics

- IoT 기반 하에 사물로 부터 정보를 받아 로봇이 정확히 판단하고 행동 것으로 예측
- 인공지능, HRI 기술의 발전으로 사람과의 상호 작용이 점점 자연스러워 지고 있음



Internet Of Things

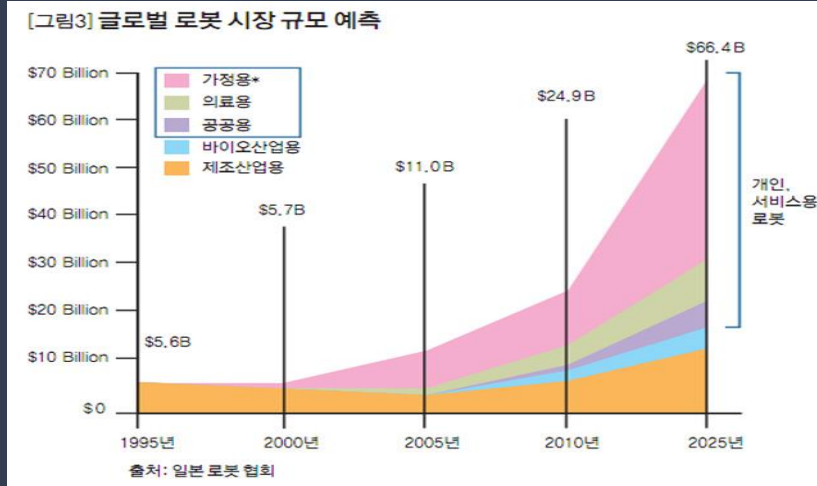
- 사람.사물.공간이 연결되는 초연결 혁명 예측
- 사물들의 지능화 및 자율화 되고 있음



Convergence

- 사람.사물.공간의 연결과 함께 로봇도 연결되어 상호 작용
- 지능화 . 자율화로 IoT과 Robotics 기술이 융합

➡ IoT & Robotics 서비스/플랫폼 통합



글로벌 로봇 시장

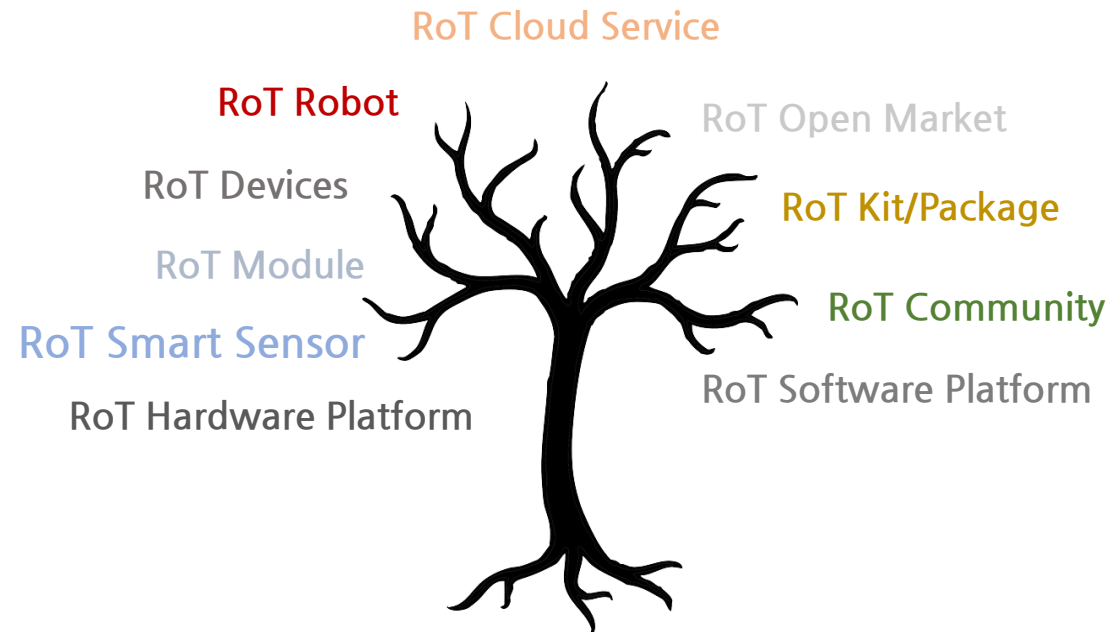
향후 2~3년 안에
개인, 서비스 로봇 시장의 도래
및 폭발적인 성장 전망



➡ 서비스 로봇 시장 본격화에 대비

When IoT meets Robotics, we can say that is...

Robotics of Things



Long-Term Goal

지능형 RoT 클라우드 서비스

- RoT Robot & 클라우드 서비스 제공
- ✓ RoT Smart Robot & Cloud Service

Intermediate-Term Goal

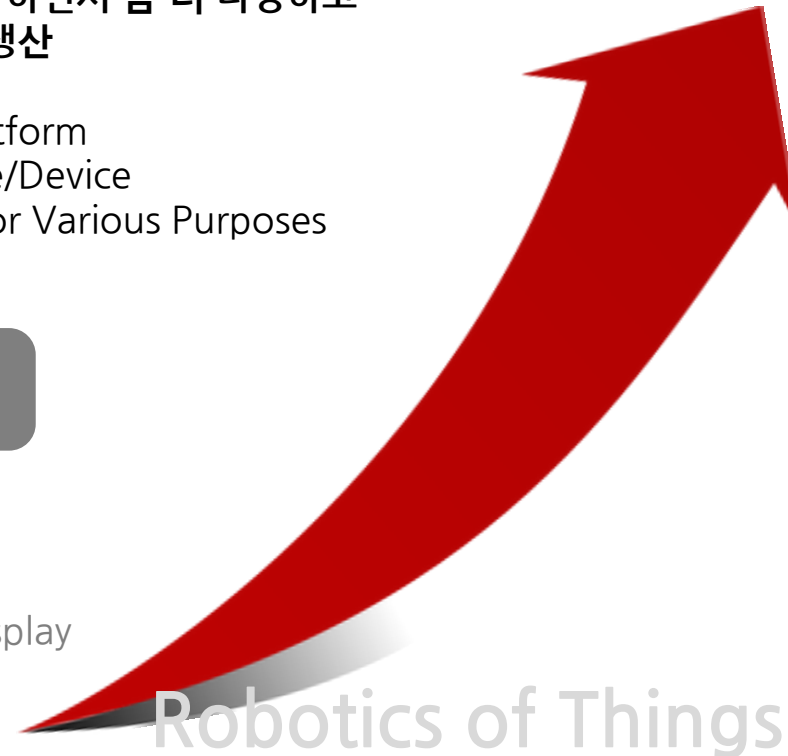
RoT Platform 지능화 및 제품 다양화

- RoT 플랫폼을 지능화 하면서 좀 더 다양하고 완제품 형태의 제품 생산
- ✓ RoT Intelligent Platform
- ✓ RoT Smart Module/Device
- ✓ RoT Kit/Package for Various Purposes
- ✓ RoT Ecosystem

Short-Term Goal

RoT Platform 개발 및 DIY 제품 출시

- RoT 오픈 플랫폼 및 모듈 기반의 DIY 제품 상용화
- ✓ RoT Base Platform
- ✓ RoT Basic Module : Sensor, Motor, Interface, Display
- ✓ RoT Kit for Kidult/Expert/Education
- ✓ RoT Community, Open Market





내가 갖고 싶은 로봇이
세상에 없다니....



Camera Robot



부품들을 사서 만들자니
너무 어렵고...

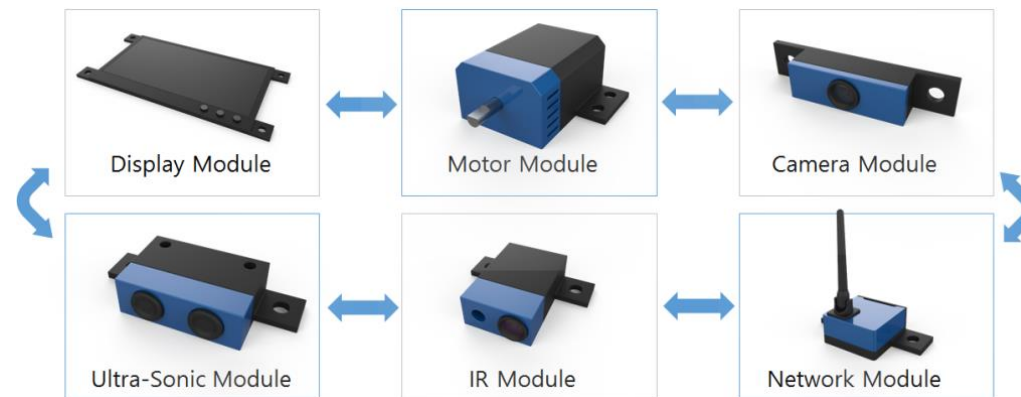
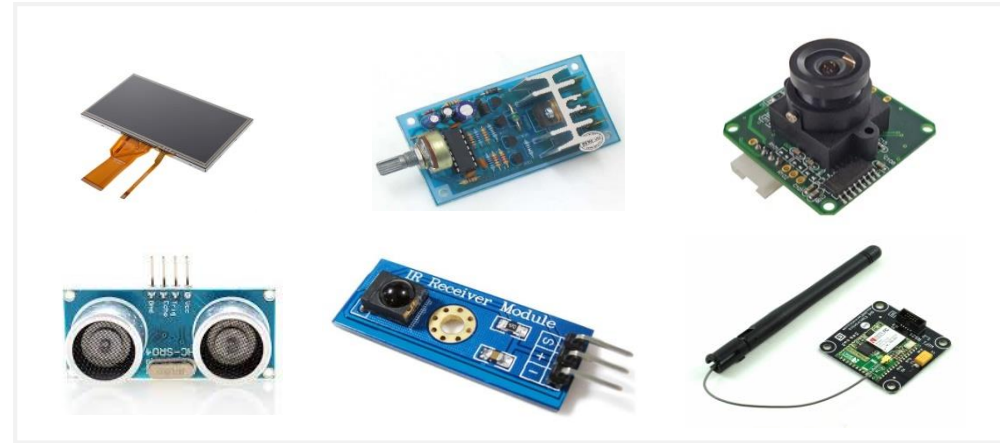


KIT를 사서 만들자니 필요한
기능을 만들 수가 없고...

나만의 로봇을 쉽게 만들 수 있는 방법이 없을까?

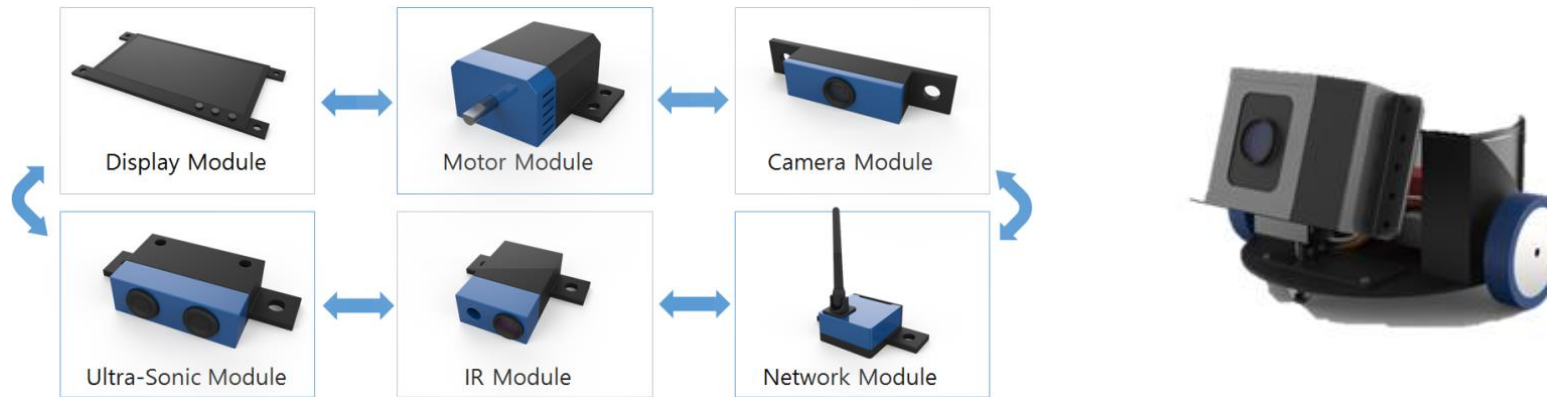


부품이 이 정도로
단순해지면 나도
만들 수 있을 것 같아!



Product Vision

누구나 로봇같이 어려운 형태의 기기도 쉽게 만들 수 있는
하드웨어 플랫폼을 세상에 제공한다.



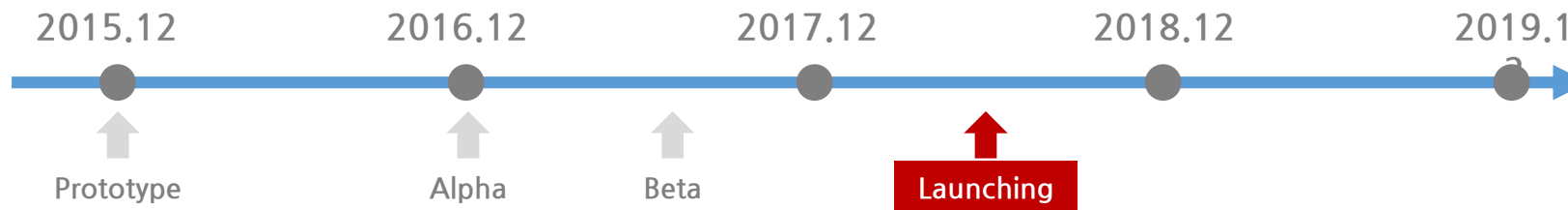
Robot of Things



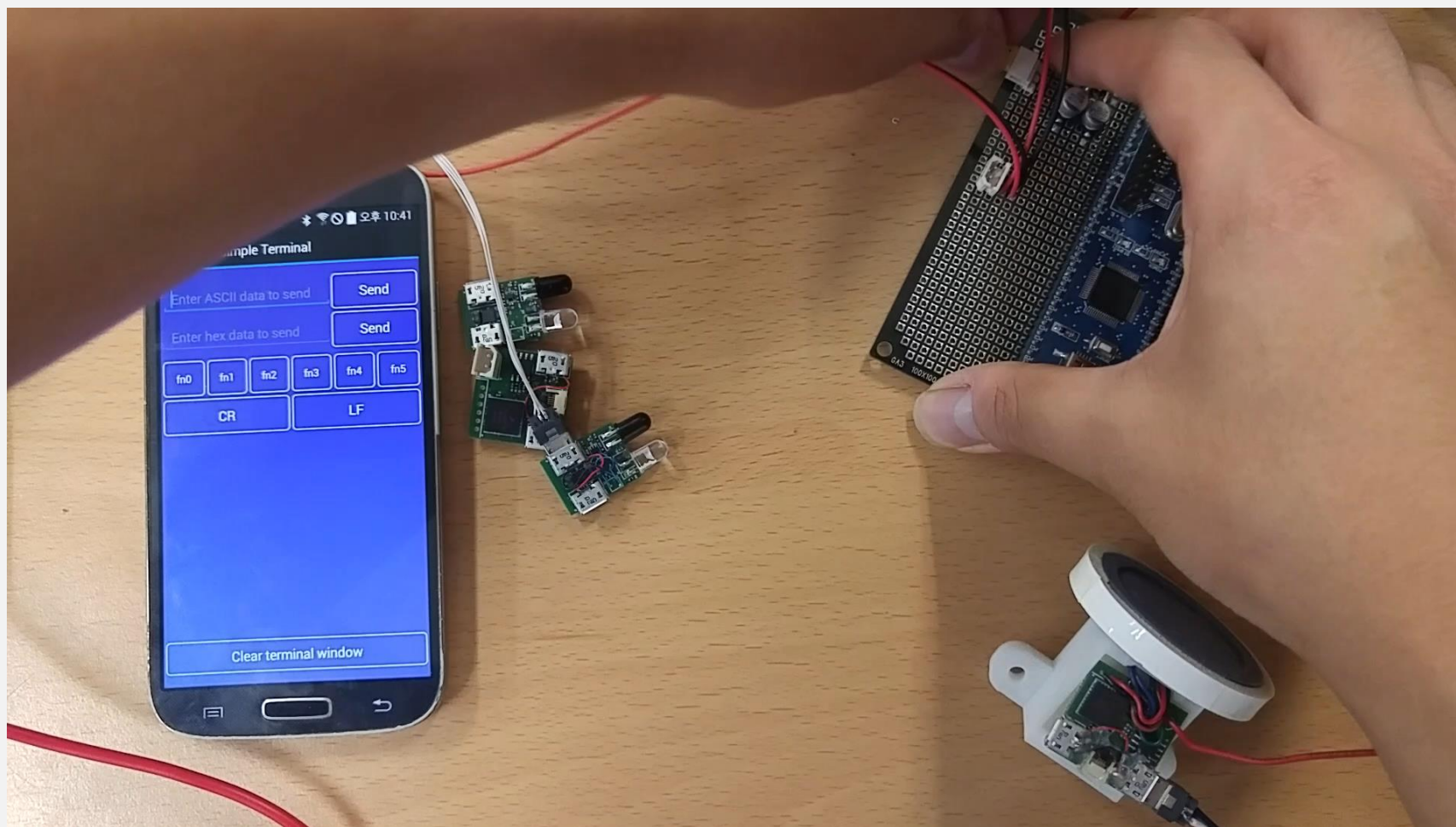
Product Goal

부품을 단순한 형태로 모듈화하고
펌웨어 개발과 같은 어려운 단계를 생략하며
로보틱스 기술이 포함된 다양한 모듈을 제공함으로써
누구나 원하는 기기를 쉽게 만들 수 있는
오픈 소스 RoT 플랫폼을 제공함

주요 Milestone



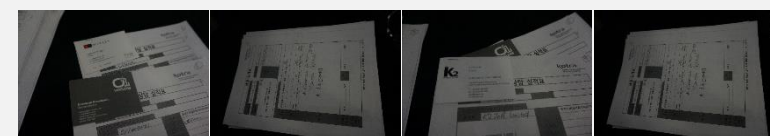
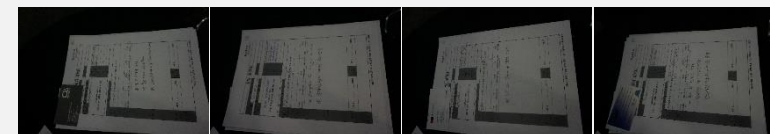
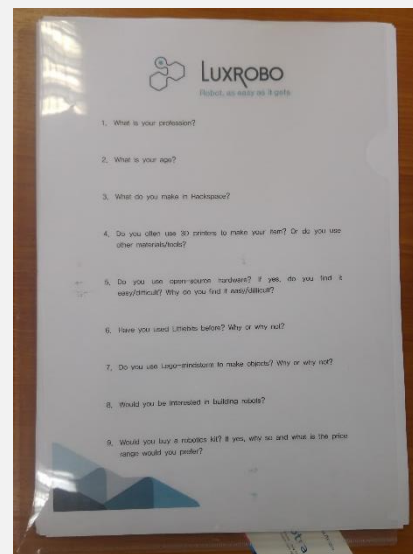
- 2015.12 : Prototype
- 2016.12 : Alpha Version
- 2016.06 : Beta Version
- 2017.06 : 제품 런칭



MODI Ver.1





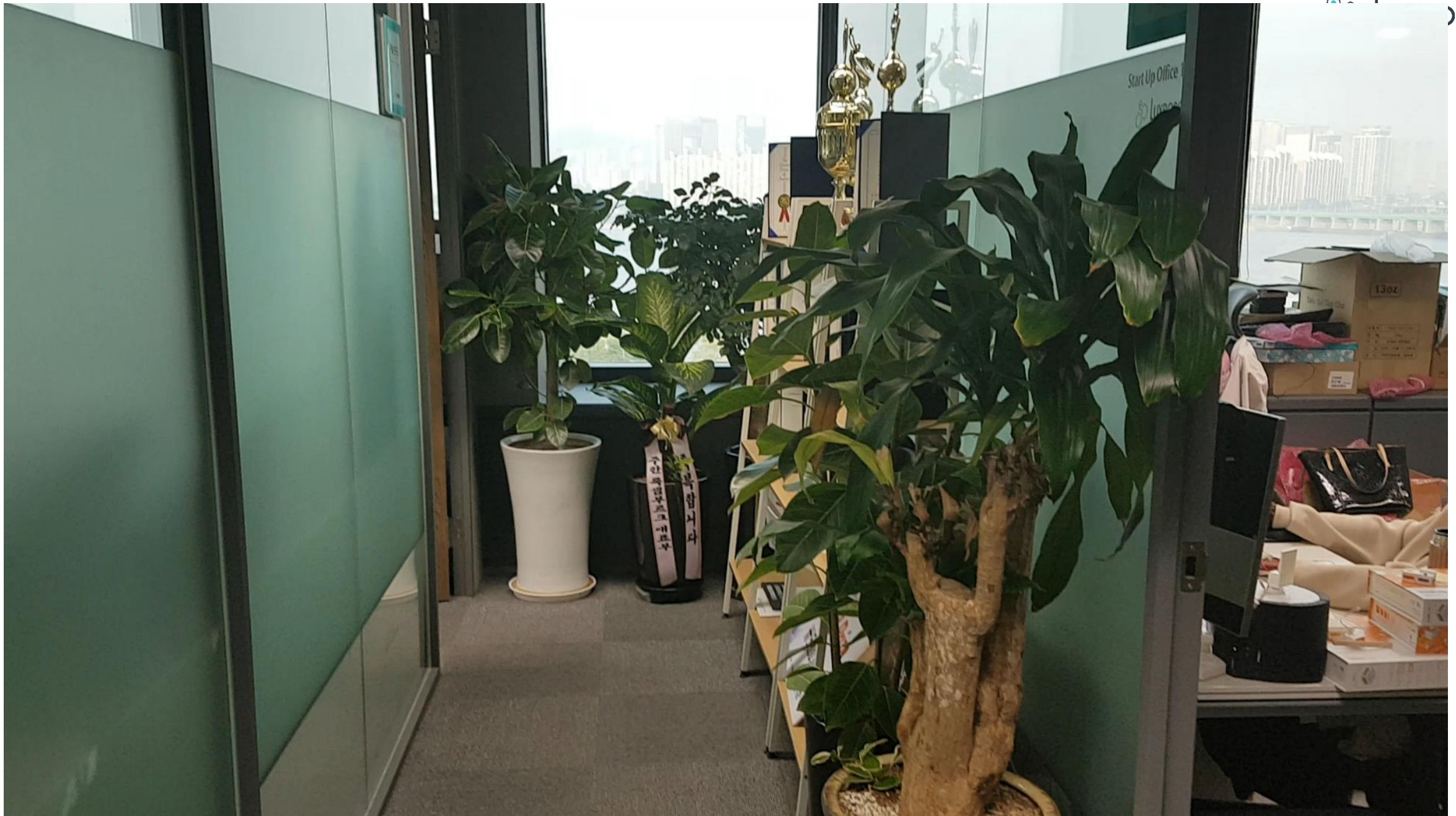






MODI Ver.2



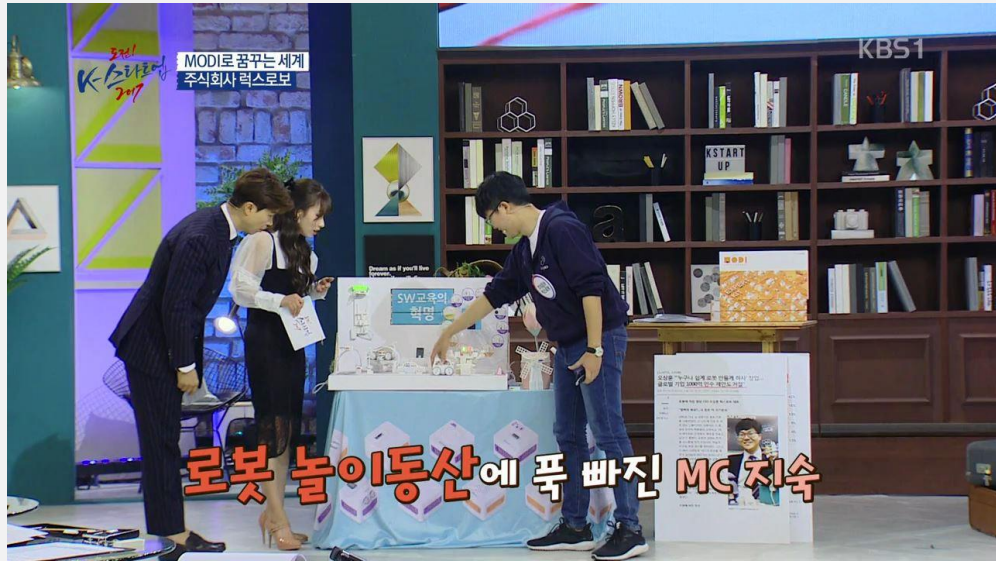




A world map with a grey background. Countries are colored in teal or light teal. The teal countries include Canada, the United States, most of Europe, Russia, China, India, Japan, South Korea, Australia, and New Zealand. Light teal countries include Brazil, South Africa, and several countries in Africa and Asia. A white horizontal band with black text is centered across the map.

MODI has been exported to 48 developed countries.







 Hanwha Public TV commercial

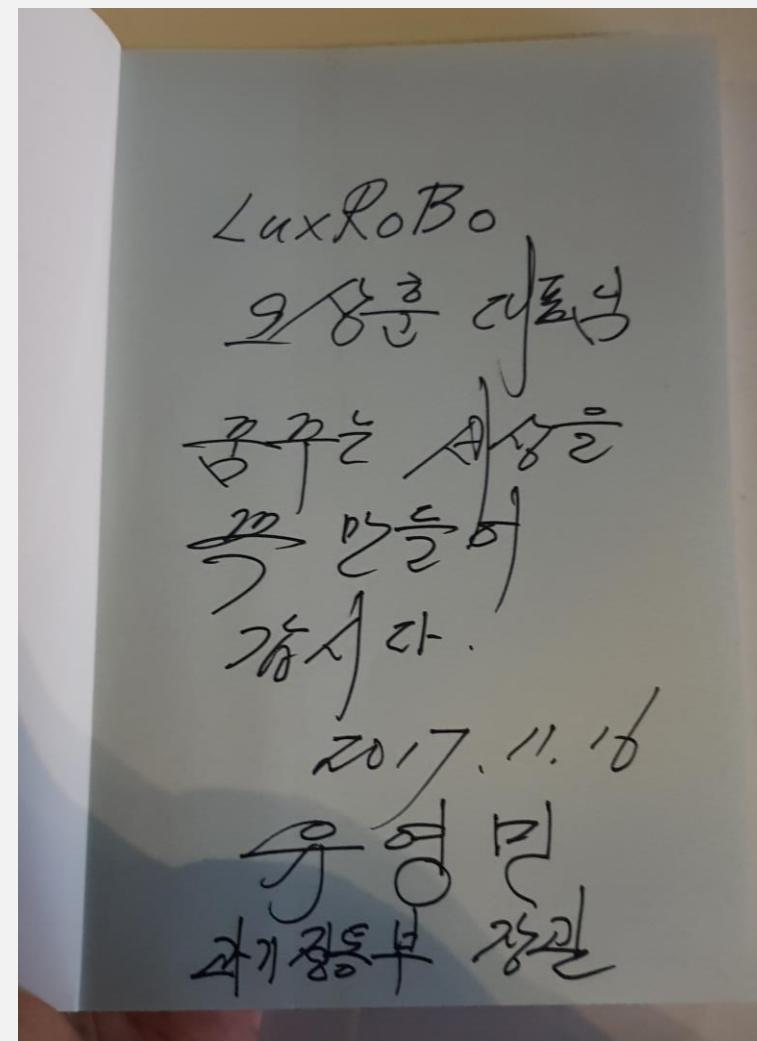




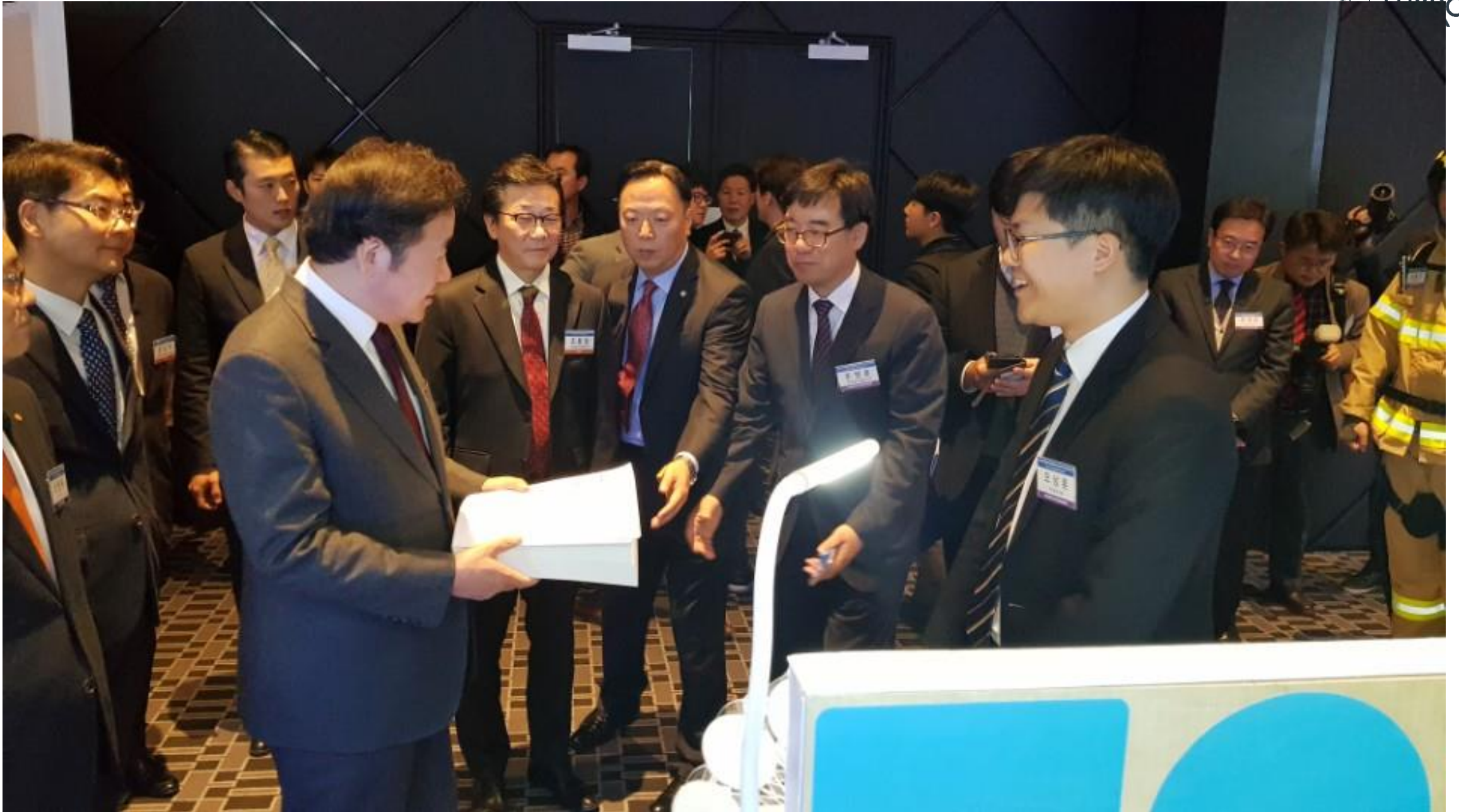
LUXROBO

Cofounders, LUXROBO



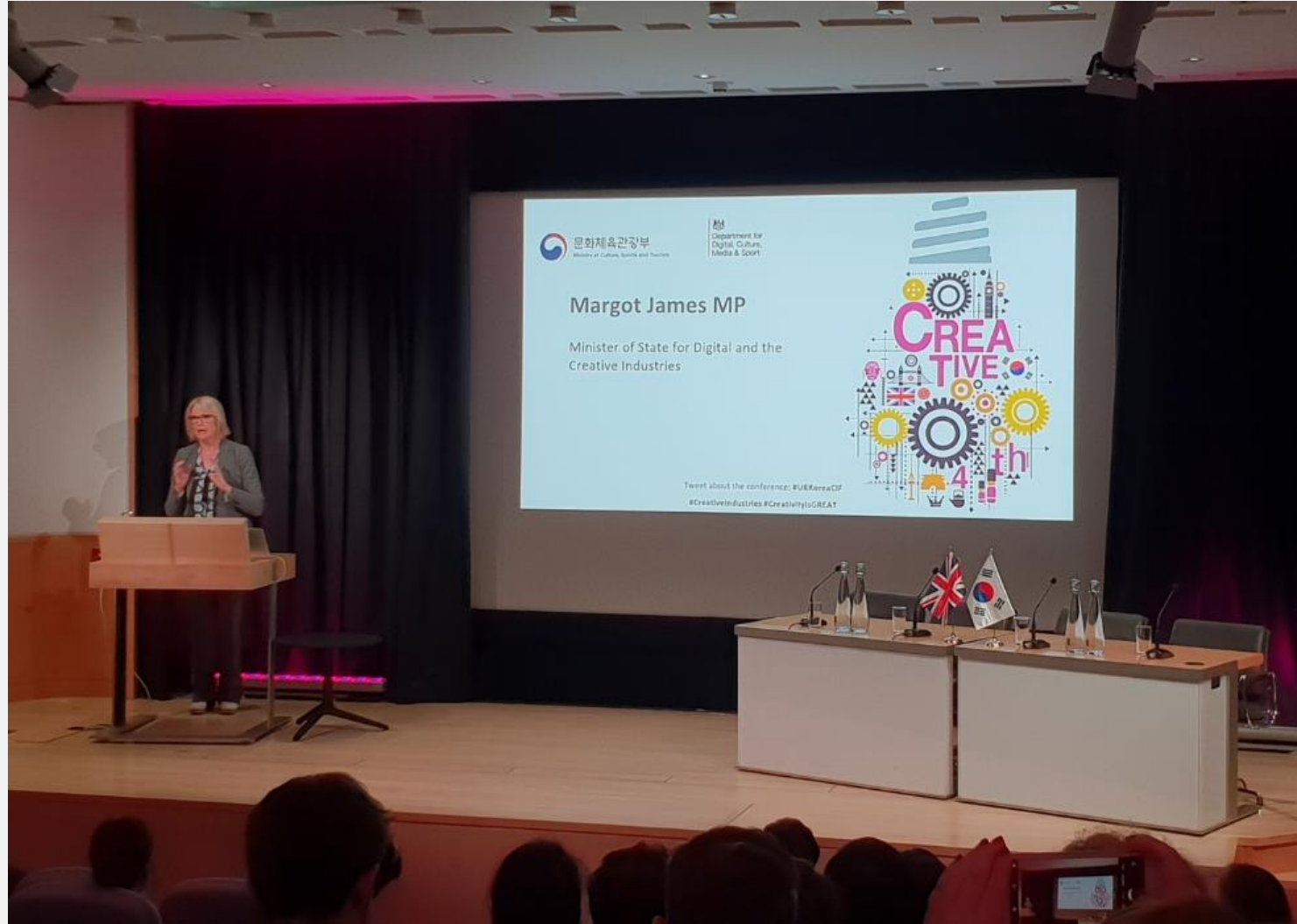


















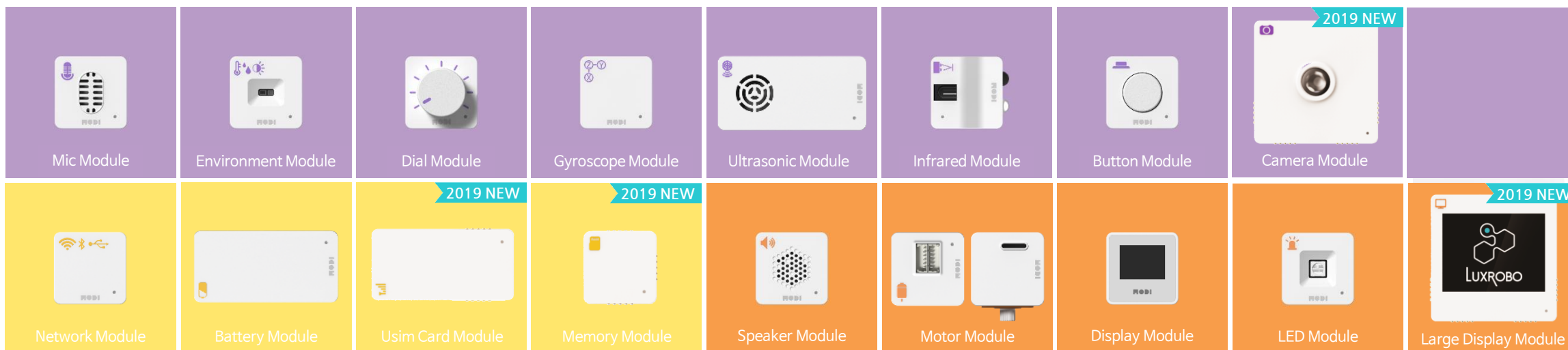


Turn your idea into reality
LUXROBO



ROBOTICS OF THINGS Platform

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reddot award 2017
winner



Competitive features of MODI

Every single MODI modules have MCU including our own micro operating system.



Micro OS



Three-stage compression
communication

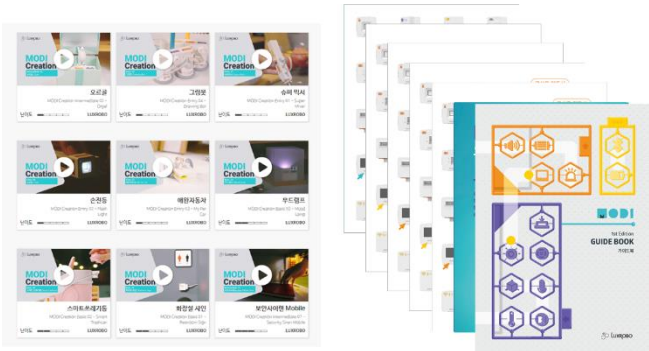
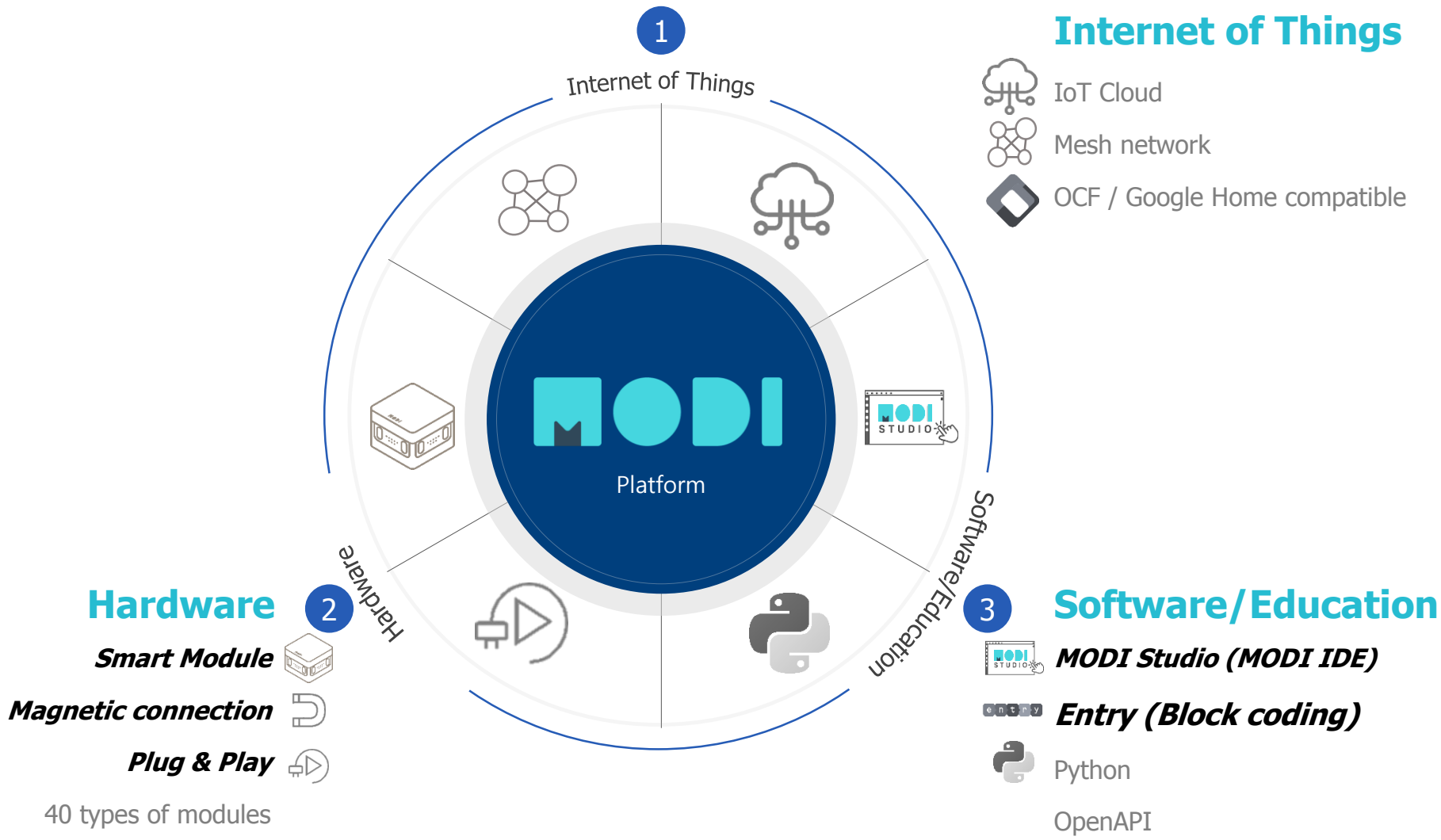


Multi-compile



Synchronize virtualization parameters

MODI System to Platform



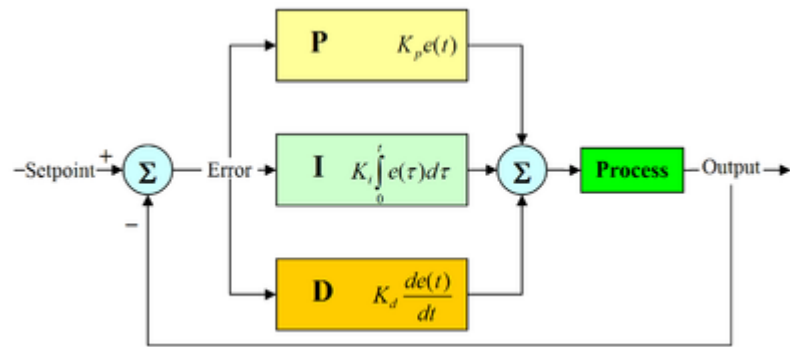
Education contents



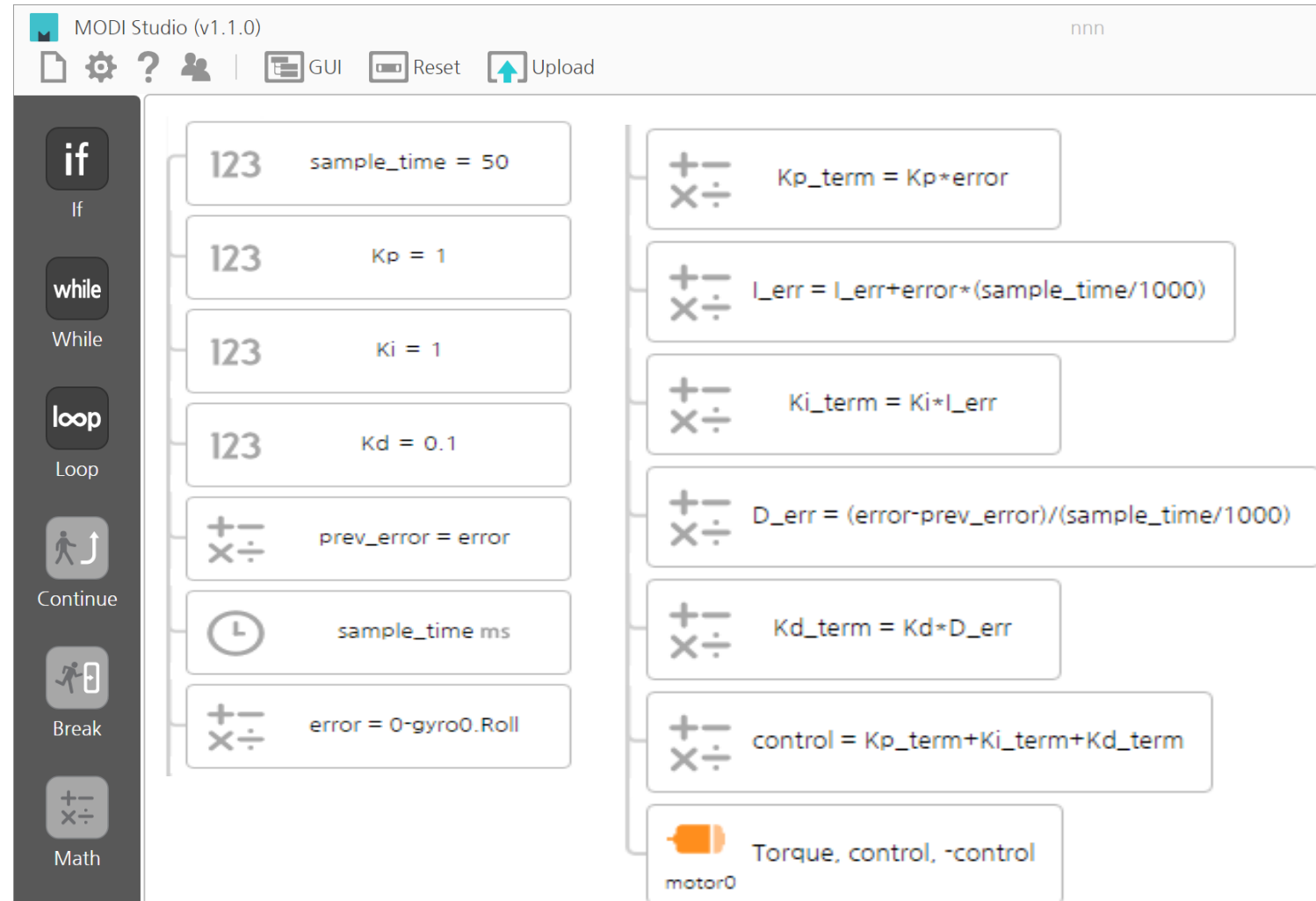
Education Service

Examples of the projects

We provide Robotics of Things platform for your creativity.



Segway as an example of high school math curriculum alignment applying differentiatinal / integrational equation.



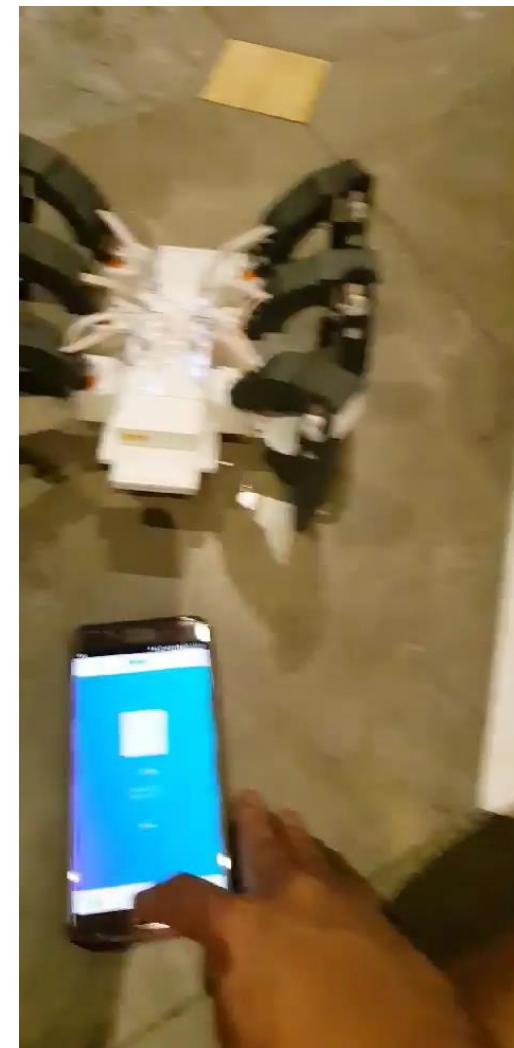
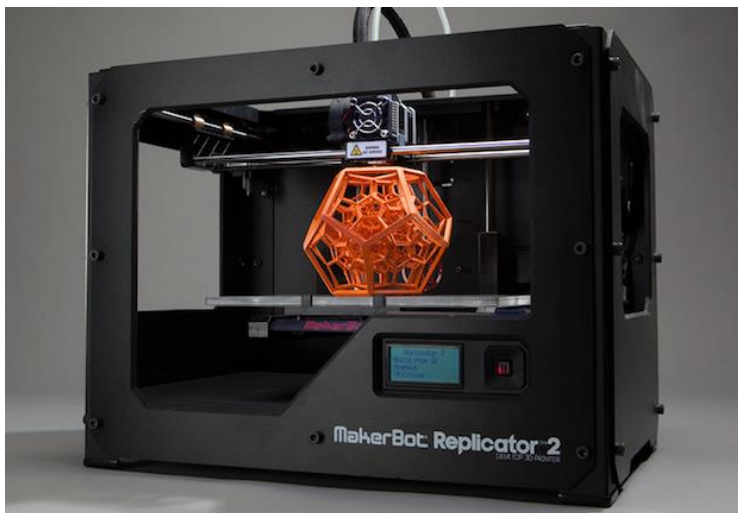
Examples of the projects

We provide Robotics of Things platform for your creativity.



Examples of the projects

We provide Robotics of Things platform for your creativity.



Examples of the STEAM

We provide Robotics of Things platform for your creativity.

Science Smart Farm

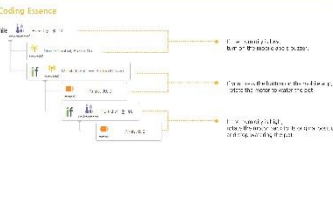
Let's experience a greenhouse that manages light, temperature, and water so the plants grow well.

Modules Needed

- Light
- Temperature
- Humidity
- Water
- Relay

Related subject area and lesson objectives

Coding Essence



Science Who drives faster?

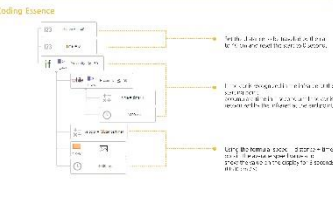
Let's move the car by tapping the floor alternately with both hands and experience the principle of the speed detector.

Modules Needed

- Light
- Temperature
- Humidity
- Water
- Relay

Related subject area and lesson objectives

Coding Essence



Science Earthquake Detector

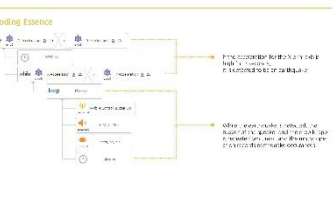
Let's experience an earthquake detector that detects vibrations and alerts the disaster alarm.

Modules Needed

- Light
- Temperature
- Humidity
- Water
- Relay

Related subject area and lesson objectives

Coding Essence



Mathematics Control the Viking Ride

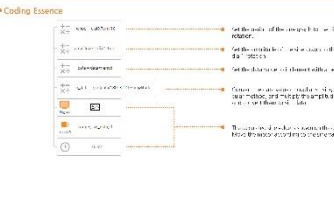
Let's experience the Viking ride by changing the cycle and amplitude of the ride according to the sign graph.

Modules Needed

- Light
- Temperature
- Humidity
- Water
- Relay

Related subject area and lesson objectives

Coding Essence



Mathematics How's the weather today?

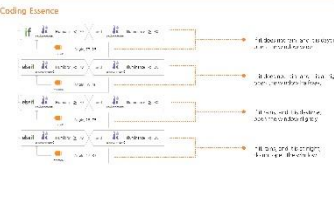
Let's experience a smart home that opens the windows according to the weather conditions.

Modules Needed

- Light
- Temperature
- Humidity
- Water
- Relay

Related subject area and lesson objectives

Coding Essence



Mathematics A puppy that follows you around

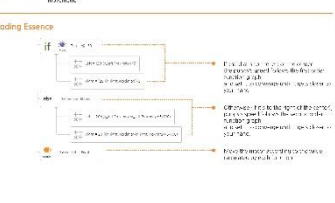
Let's experience the difference between the first-order function and the second-order function graphs by creating a puppy that follows a hand at different speeds.

Modules Needed

- Light
- Temperature
- Humidity
- Water
- Relay

Related subject area and lesson objectives

Coding Essence



Art Measure your lung capacity

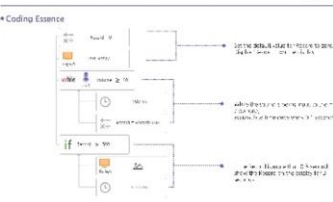
Let's experience a spirometer that measures how long you can breathe.

Modules Needed

- Light
- Temperature
- Humidity
- Water
- Relay

Related subject area and lesson objectives

Coding Essence



Art Stage lighting that follows me

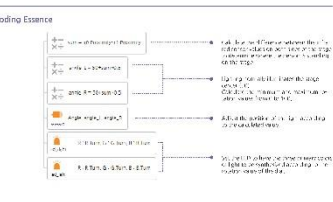
Let's experience the stage lighting that adjusts the color of the light by combine the three primary colors of light and follows the target by recognising the target's position.

Modules Needed

- Light
- Temperature
- Humidity
- Water
- Relay

Related subject area and lesson objectives

Coding Essence



Art Magic harp and the feast of light

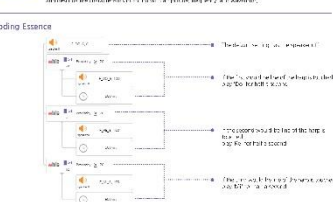
Let's experience the harp that can recognize the movement of the hand and play with no strings, and the mood lamp which changes color according to the music.

Modules Needed

- Light
- Temperature
- Humidity
- Water
- Relay

Related subject area and lesson objectives

Coding Essence



Tech & Engineering Self-balancing Segway

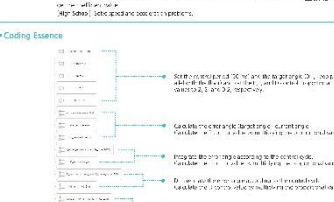
Let's make a self-balancing Segway through proportion, integral, derivative (PID) control.

Modules Needed

- Light
- Temperature
- Humidity
- Water
- Relay

Related subject area and lesson objectives

Coding Essence



Tech & Engineering Cargo Bot

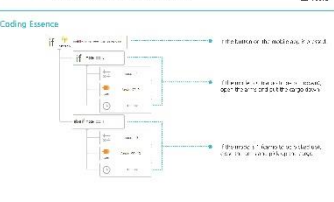
Let's experience a robot that moves cargo at the factory.

Modules Needed

- Light
- Temperature
- Humidity
- Water
- Relay

Related subject area and lesson objectives

Coding Essence



Tech & Engineering Working with a Robot Hand

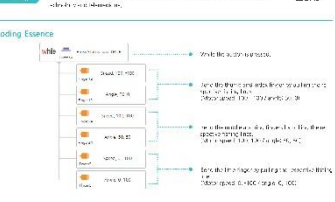
Let's experience a robot hand made with 3D printing that duplicates movement of a person's bones and muscles.

Modules Needed

- Light
- Temperature
- Humidity
- Water
- Relay

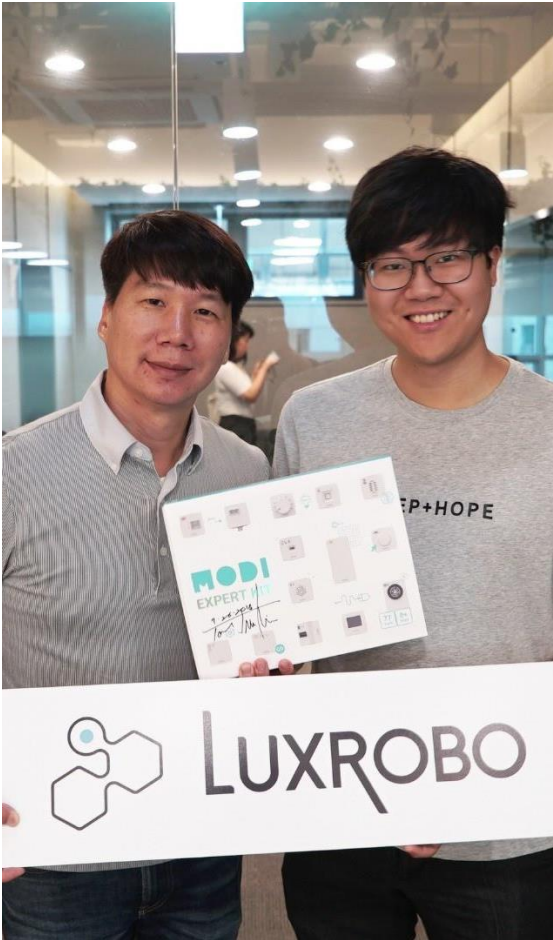
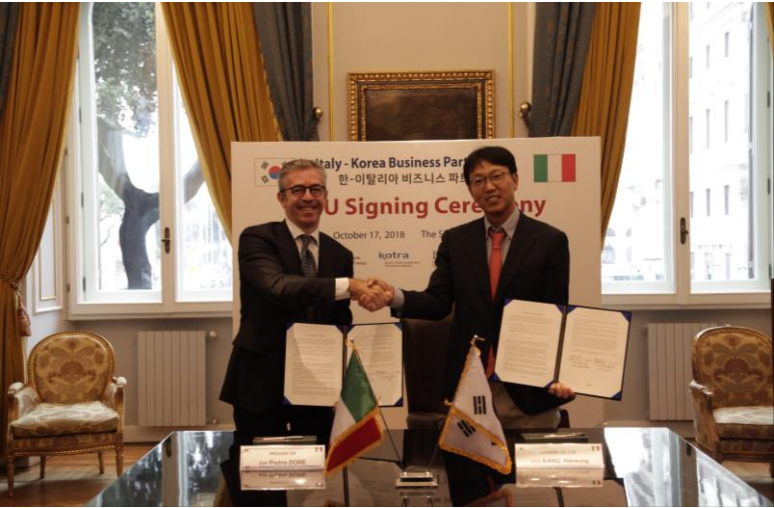
Related subject area and lesson objectives

Coding Essence



MOU of Global

We need you to be our family.



MODI IoT Platform

Introduce Luxrobo



Members of LUXROBO

We need you to be our family.



“the calling of LUXROBO is to sell the technology of things, spaces, values that you want “

- CEO Oh Sang Hun, LUXROBO -

