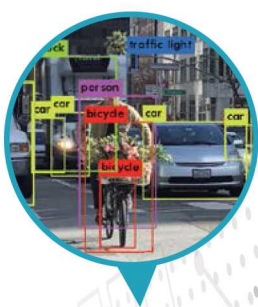


AI _ Artificial Intelligence

AI IoT Smart Server



Starting from the basic concept of IoT, it is possible to learn various tasks such as face recognition, object recognition, facial expression recognition, sensor control, various communication, IoT server construction, machine learning, and deep learning based on TensorFlow JS through server end node control.

It also provides a wide range of experiences in various OS through development environment build using various languages.

AI _ Artificial Intelligence

AI IoT Smart Server

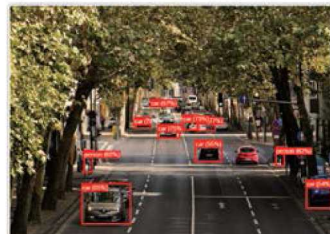
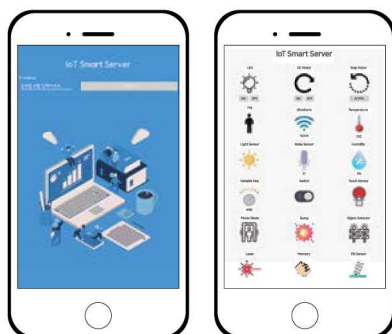


This is a product that enables learning not only the basic concept of IoT, but also IoT remote control system which is implemented in various ways and deep learning using TensorFlow. This was developed to provide a wide range of knowledge and experience from the start of the IoT field to the deep learning of artificial intelligence. You can learn IoT sensor control, remote communication and control using wireless network, server construction, face recognition, object recognition, facial expression recognition by using languages such as C, HTML, PHP, JavaScript, and Python in various environments.

Product Features

- You can learn various sensor control method such as basic control and remote control through wireless communication.
- You can control and experience over 30 different sensors used in real life.
- Provides the experience of building a server as required by IoT.
- Provides experience with Raspberry Pi and Linux.
- You can learn about Bluetooth communication.
- You can experience HTTP protocol and server / client communication.
- Experience in a wide range of programming languages including C, HTML, PHP, JavaScript, and Python.
- Training on web page composition through JavaScript available.
- Provides Android based HTTP interworking application.
- Provides practical exercises for TensorFlow using Python.
- Provides Deep Learning example using TensorFlow JS.
- You can learn AI-based face recognition, object recognition, and facial expression recognition.

APPS



Hardware Specifications

Module	Category	Specifications	Module	Category	Specifications
Raspberry Pi 3B	Processor	Broadcom BCM2837 1.2GHz Cortex-A53 Quad-core	Sensor Modules	Touch Sensor	Sensor : TTP223 Operating Voltage : 3.3V~5V Dimension : 15x11(mm) I/O Interface : 1pin Digital Output
	Memory	1GB LPDDR2 SDRAM		Photo Diode	Sensor : FC33 Operating Voltage : 3.3~5V I/O Interface : 1pin Digital Output
	Storage	MicroSD 8GB		Hit Sensor	Sensor : SW-420 Operating Voltage : 5V I/O Interface : 1pin Digital Output
	USB 2.0	USB A Type 4 ports		Dust Sensor	Sensor : GP2Y1014AU0F Operating Voltage : 5V I/O Interface : 1pin Digital Input, 1pin Analog Output
	Power	Micro USB socket 5V, 2A		Gas Sensor	Sensor : MQ-2 Operating Voltage : 3.3V~5V I/O Interface : 1pin Analog Output
	Audio	3.5mm A/V Jack		Soil Moisture	Operating Voltage : 3.3V~5V I/O Interface : 1pin Analog Output
	Video	HDMI 1.4 Video		IR Tracking	Operating Voltage : 3.3V~5V I/O Interface : 1pin Digital Output
	Ethernet	10/100 Base T		Thermistor Temperature	Operating Voltage : 3.3V~5V I/O Interface : 1pin Analog Output
	Wireless	802.11n, Bluetooth 4.0		Temperature	Sensor : LM35 Operating Voltage : 3.3V~5V I/O Interface : 1pin Analog Output
	Expansion I/O	40EA GPIO (2x20 2.54mm Pitch Header)		Limit Switch	Operating Voltage : 3.3V~5V I/O Interface : 1pin Digital Output
Size	116x56mm	Knock Sensor	Operating Voltage : 3.3V~5V I/O Interface : 1pin Digital Output		
RSP Shield	Expansion I/O	40EA GPIO (2x20 2.54mm Pitch Header)	Relay	Feature : NC/NO Relay, 250VAC 10A / 30VDC 10A Operating Voltage : 3.3V~5V I/O Interface : 1pin Digital Input	
	ADC	8ch 12bit Analog to Digital Converter	Actuator Modules	LED Module	Feature : RED Operating Voltage : 3.3V~5V Current : 20mA Lumminous Intensity : 6000~7000mcd at 20mA View Angle : 30 Degree I/O Interface : 1pin Digital Input
Sensor Modules	PIR	Sensor : RE200B Sensing Range : 110 Degree Operating Voltage : 3.3V I/O Interface : 1pin Digital Out		DC Motor	Motor : Micro Type DC Motor Motor Driver : TB6552 Operating Voltage : 5V I/O Interface : 2pin Digital Input
	Sound Sensor	Sensor : Microphone Feature : ambient sound detection, sound level detection Operating Voltage : 5V I/O Interface : 1pin Analog Output		Step Motor	Feature : 32 Step, 1/16 Gear Motor Motor Driver : ULN2003 Operating Voltage : 5V I/O Interface : 4pin Digital Input
	Humidity Temperature Sensor	Sensor : DHT11 Feature : temperature and humidity sensor, ambient temperature and humidity detection Operating Voltage : 5V I/O Interface : 1pin Digital Output		Switch Module	Feature : Tact Button I/O Interface : 1pin Digital Input
	UltraSonic	Sensor : HC-SR04 Feature : 2~500cm distance measuring range, 40kHz Frequency Operating Voltage : 5V I/O Interface : 2pin Digital Output		Buzzer Module	Sound Output at 10cm : 60dB (Min) Operating Voltage : 3.3V~5V Current Consumption : 2mA Dimension : 15x19 (mm) I/O Interface : 1pin Digital Input
	Light Sensor	Sensor : CdS Operating Voltage : 5V I/O Interface : 1pin Analog Output		Laser Module	Wavelength : 650nm Operating Voltage : 5V Dimension : 15x19 (mm) I/O Interface : 1pin Digital Input
	Variable Resistor	Sensor : 1kΩ Variable Resistor Feature : 0~5V DC Variable Voltage out I/O Interface : 1pin Analog Output		RGB LED	Operating Voltage : 3.3V~5V I/O Interface : 3pin Digital Input
	Tilt Sensor	Contact Resistance : 50mΩ max Operating Voltage : 3.3V~5V I/O Interface : 1pin Digital Output Dimension : 15x19 (mm)		Camera Module	- HD 1080P USB camera module
	Mercury Sensor	Operating Voltage : 3.3V~5V I/O Interface : 1pin Digital Output Dimension : 15x19 (mm)			- Output image format : YUV2 (YUYV) / MJPEG
	Reed Sensor	Operating Voltage : 3.3V~5V Switching Current : 0.5A Contact Rating : 10W/VA Dimension : 21x36 (mm) I/O Interface : 1pin Digital Output			- Minimum illumination : 0.01LUX
	IR obstacle Sensor	Operating Voltage : 3.3V~5V Sensing Range : 2~40cm Dimension : 16x41 (mm) I/O Interface : 1pin Digital Output, 1pin Analog Output	- Working current : 140mA~220mA		
Flame Sensor	Operating Voltage : 3.3V~5V Sensing Range : 60 Degree Adjustable Sensitivity : Variable Resistor Dimension : 15x41 (mm) I/O Interface : 1pin Digital Output, 1pin Analog Output	- Support free flooding protocol : USB Video Class (UVC)			

Software Specifications

Module	Category	Specifications
RaspberryPi 3B	Raspbian	4.9.2-10
	Kernal	4.4.11-v7+
	GCC	4.9.2
	lighttpd	1.4.35
Server Software	PHP	5.6.36-0+deb8u1
	Bluetoothctl	5.23

Module	Category	Specifications
Android Application	SDK	API 18(4.3 Jellybean) to API 28(9.0 Pie)
	JRE	1.8.0_152
Learning Engine	TensorFlow.JS	API 1.0.0

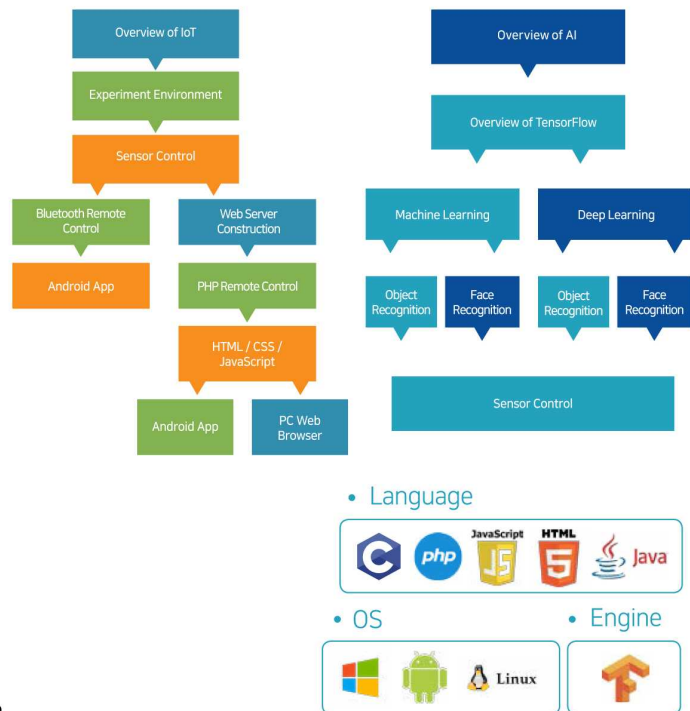
Training Contents

[Book1]

1. Overview of the Internet of Things
2. Configuration of IoT Smart Server and Experiment Environment
3. Practice of Smart Sensor Control using Raspberry Pi
4. Remote Control using Bluetooth
5. Web Server Construction using Lighttpd
6. Remote Control using PHP
7. Configuring the Interface using JavaScript

[Book2]

1. Sensor Control Practice with Python
2. Server Creation and Remote Control with Python
3. TensorFlow Using Python
4. TensorFlow Using Javascript
5. Object Recognition Using Javascript & TensorFlow JS
6. Face Recognition Using Javascript & TensorFlow JS
7. IoT Practice with Object Recognition & Face Recognition



Block Diagram

