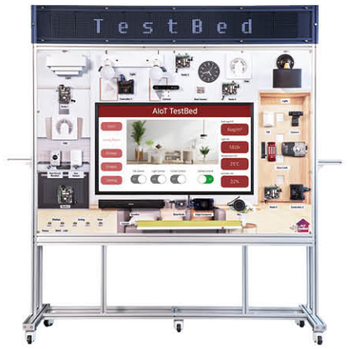
스마트홈 기반의 **AIoT 테스트베드 플랫폼** | HANBACK ELECTRONICS

- 스마트 홈 제품 연동을 테스트할 수 있는 Open API 기반 IoT 테스트 베드 플랫폼
- 출입문, 거실, 주방 영역으로 나눠지며, 각 영역별 인공지능 IoT 서비스 지원
- 고성능 AIoT 서버와 고성능 액세스 포인트 및 IoT 노드(센서 및 액추에이터), 디스플레이, 카메라, 오디오(마이크, 스피커)로 구성
- 고성능 IoT 서버는 CUDA GPGPU를 통해 인공지능 가속 연산 지원
- 터치 스크린을 포함한 43인치 4K UHD 대형 모니터를 통해 GUI 기반 테스트 베드 운영 모니터링 지원
- 감성 조명 및 실시간 알림 서비스를 구현할 수 있는 대형 픽셀 디스플레이 제공
- 기가비트 이더넷과 Wi-Fi 및 블루투스, 지그비를 통해 다양한 IoT 커넥티비티 지원
- 인공지능 기반 음성 명령 서비스 구현에 필요한 고성능 디지털 마이크 및 스피커 제공
- 사용자 맞춤형 서비스 구현에 필요한 딥러닝 기반 영상 인식 서비스 지원
- AIoT 전용 운영체제인 Soda OS와 Pop 라이브러리 지원
- 파이썬3를 비롯해 프로그래밍 입문에 최적화된 인터프리터 기반의 C/C++ 개발환경 지원
- PC를 비롯해 태블릿 등에서 파이썬3와 C/C++를 동시에 학습할 수 있는 웹브라우저 기반 전용 학습 환경 지원
- mDNS/DNS-SD 기반 분산 이름 확인 및 네트워크 서비스 게시, 발견 지원
- 전문적인 응용 개발을 위해 Visual Studio Code 기반 공개용 통합개발환경 지원
- 기존 AIoT 교육 장비와 연계한 AIoT 종합 실습 컨텐츠 제공

제품 구성품



AIoT TestBed


USB Repeater Cable 5M
5EA


220V Power Cable
1EA


USB A to B Cable
5EA


Ethernet Cable
1EA


Platform USB
(Include OS Image and Tools)
1EA


User Guide book
1EA

www.hanback.com

AIoT TESTBED

스마트홈 기반의 AIoT 테스트베드 플랫폼

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Since 1984

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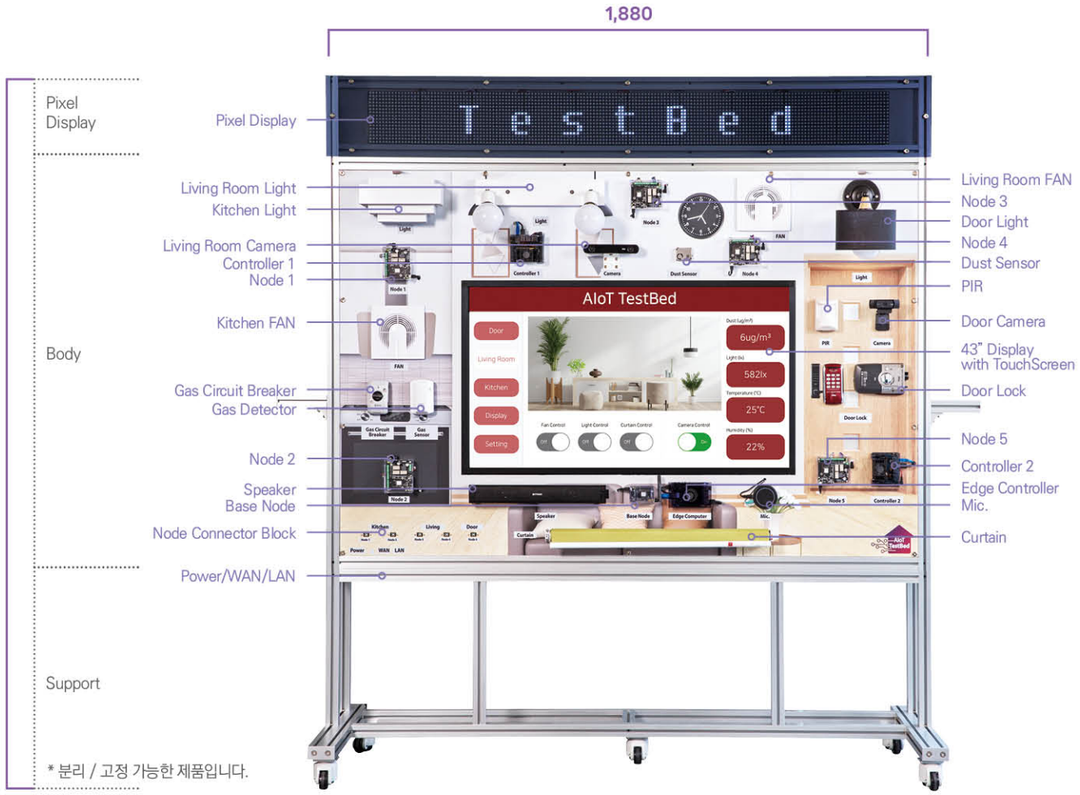
 V1.0.1

홈페이지 바로가기

AIOT TESTBED



교육컨텐츠

- AIoT TestBed 실습환경
- 저전력 무선 센서네트워크 프로그래밍
- 음성 명령으로 IoT 센서 제어 프로그래밍
- 스마트폰 연동 프로그래밍
- 클라우드 프로그래밍
- 딥러닝 기반 얼굴인지 프로그래밍

소프트웨어사양 HANBACK ELECTRONICS

List		Specifications
Soda OS	Linux Kernel	4.19
	Desktop	X-Server, Openbox, LightDM, Tint2, blueman, network-manager, conky
	CLI	Zsh, Tmux, Peco, powerlevel9k thema, Powerline fonts
	Tool Chain	GCC 9, JDK, Node JS, Python3, Clang
	IDE	Visual Studio Code, NeoVim, Geany
	Connectivity	Mosquitto(MQTT), Bluez, mtr, nmap, iptraf, Samba, Blynk Server, Remove Desktop Server
	Multimedia	portaudio. sox, OpenCV 4, snowboy, Google Assistant
	Data Science & AI	Python3, Numpy, Matplotlib, sympy, Pandas, Seaborn, Scipy, Gym
		Scikit-learn, Tensorflow, Keras
Pop Library	Output Object (C/C++, Python3)	Led, Laser, Buzzer, Relay, RGBLed, DCMotor, StepMotor, OLed
		PiezoBuzzer, PixelDisplay, TextLCD, FND, Led Bar
	Input Object (C/C++, Python3)	Switch, Touch, Reed, LimitSwitch, Mercury, Knock, Tilt, Opto, Pir, Flame
		LineTrace, TempHumi, UltraSonic, Shock, Sound, Potentiometer, Cds
		SoilMoisture, Thermistor, Temperature, Gas, Dust, Psd. Gesture
	Multimedia (Python3)	AudioPlay, AudioPlayList, AudioRecord, Tone, SoundMeter
	Voice Assistant (Python3)	GAssistant, create_conversation_stream
	AI (Python3)	Linear Regression, Logistic Regression, Perceptron, ANN, DNN, CNN, DQN

하드웨어사양 HANBACK ELECTRONICS

List			Specifications
AIoT Server Part			CPU: Intel 8th m3-8100
			Core: 1.1-3.4GHz Dual-Core, Four-Thread
			RAM: 8G LPDDR3
			Memory: 64GB eMMC V5.0, 512G M.2 SSD
			Graphics: Intel HD Graphics 615, 300-900MHz, NVIDIA GeForce RTX 20
		External Memory	1xM.2M Key, PCIe4x, Supports NVMe SSD and SATA SSD 1xM.2E Key, PCIe2x, Supports USB2.0,UART,PCM
		Connectivity	WiFi 802.11ac, 2.4G & 5G Dual Band Bluetooth 4.2 Gigabit Ethernet
		USB Ports	3x USB3.0 Type A 1x USB Type C, Supports PD, DP, USB3.0
		Display	HDMI Output | Type-C DP Support Extendable eDP Touch Displays
		Co processor: Arduino Leonardo	
		GPIO & Other Features	2x50p GPIOs Including I²C, I²S, USB, UART, RTC, Power Management Extendable Power Button
		GPU: NVIDIA GeForce® GTX 1080 Ti	CUDA Core: 3584 Memory: 11GB(GDDR5X 352bit/4848.4 GB/s) Power Consumption: 250W
Display			Screen Size: 43"(16:9 Wide)
			Resolution: 4K UHD
			Interface: HDMI
			High Dynamic Range Support
		Touch Screen	10-point | Response Time <= 15ms Touch Accuracy: ±2mm | Scan Rate: 125Hz Communication: USB2.0 Full Speed Transmission Rate: 12Mbps
Speaker			Power Rating: 7W
			Speaker Unit: 2.0"Full Range Speaker+Vibrating Diaphragm
			Channel: 2.0CH | Power: DC5V(USB)
Microphone			High Performance Digital Microphone x 4EA
			Sensitivity: -26 dBFS(Omnidirectional)
			Acoustic Overload Point: 120dBSPL | SNR: 63dB
Ethernet Access Point			Memory: 128MB Flash | WAN: 10/100/1000Mbps x1
			LAN: 10/100/1000Mbps x8 | Protocols: HTTP, DHCP, PPPoE
Edge Computer			CPU: Quad-Core ARM A57 @ 1.43 GHz
			GPU: Maxwell Core 128EA
			Memory: 4GB 64-bit LPDDR4 25.6 GB/s
			Storage: MicroSD (64GB)
			Video Encoder: 4K@30 | 4x 1080p@30 | 9x 720p@30 (H.264/H.265)
			Video Decoder: 4K@60 | 2x 4K@30 | 8x 1080p@30 | 18x 720p@30 (H.264/H.265)
			Camera: MIPI CSI-2 DPHY lanes
		Connectivity	Dual Band Wireless WiFi 2GHz/5GHz Band, 867Mbps, 802.11ac Bluetooth 4.2 | Gigabit Ethernet
			Display: HDMI and Display Port
			USB: 4x USB 3.0, USB 2.0 Micro-B
Living Room	XNode Auto x 2EA		High Performance 32-bit 76.8 MHz ARM Cortex®-M33
			RAM: 128KB / Flash Memory: 1MB
		ZigBee 3.0	Frequency: 2.4GHz Range: Max 3200m (outdoor), Max 90m(indoor) Data Rate: 250kbps | Sensitivity: -103dBm Output Power: 19dBm Receiver Sensitivity: -100 dBm Bluetooth Support
		Light Sensor	Illuminance: 1 ~ 65535(lx) | Interface: I²C
		HUMIDITY & TEMPERATURE Sensor	Humidity Resolution: 12bit(0.04%RH), 8bit(0.7%RH) Humidity Accuracy: +-3%RH Temperature Resolution: 14bit(0.01C), 12bit(0.04C) Temperature Accuracy: +-4°C Interface: I²C
		Motor Driver	Up to 46V/4A | 3.5mm Terminal Block
		Relay Control	Nominal Switching Capacity: AC 8A/250V, DC 5A/30V Output: NO, COM
		I/O Interface: I²C, GPIO Terminal Block	
	Light		Type: Downlight LED | Normal Voltage: 220V/60Hz
			Socket Size: E26 | Size: 320x80x100(mm)
	FAN		Normal Voltage: 220V/60Hz
			Power Consumption: 13W | Size: 166x166x84(mm)
	Camera		Dual Image Sensor(1/3" 4MP CMOS)
			Array Size: 2688 x 1520 pixels
			Output Resolution: 2x(1920x1080) @15/30fps Cropping Mode 2x(672x376) @15/30/60/100롇 binning 4x4 mode
			Baseline: 120mm(4.7")
			Field of View: Max. 110°(H)x70°(V)x120°(D)
			Accelerometer Range: ±8G
			Gyroscope Range: ±1000dps
			Magnetic Field Range: ±2500uT(z), ±1300uF(x,y)
			Pressure Range: 300to 1100hPa
			Temperature Range: -40 to 125℃
	Dust Sensor	Measurement Range	PM1.0 : 0 ~ 10000ug/m3 PM2.5 : 0 ~ 10000ug/m3 PM10 : 0 ~ 10000ug/m3
			Resolution: 1ug/m3 | Respond Time: 1sec
			Time to First Reading: ≤8seconds | Operating Voltage: 3.3V
			I/O Interface: I²C
	Curtain		Roll Curtain Electric Motor | Suit for Roller Blinds
			Suit for Pipe with 36mm Inner Diameter | Support Weight: About 4kg

List			Specifications
Kitchen	XNode Auto x 2EA		High Performance 32-bit 76.8 MHz ARM Cortex®-M33
			RAM: 128KB / Flash Memory: 1MB
		ZigBee 3.0	Frequency: 2.4GHz Range: Max 3200m (Outdoor), Max 90m(Indoor) Data Rate: 250kbps Sensitivity: -103dBm Output Power: 19dBm Receiver Sensitivity: -100 dBm Bluetooth Support
		Light Sensor	Illuminance: 1 ~ 65535(lx) | Interface: I²C
		HUMIDITY & TEMPERATURE Sensor	Humidity Resolution: 12bit(0.04%RH), 8bit(0.7%RH) Humidity Accuracy: +-3%RH Temperature Resolution: 14bit(0.01C), 12bit(0.04C) Temperature Accuracy: +-4°C Interface: I²C
		Motor Driver	Up to 46V/4A | 3.5mm Terminal Block
		Relay Control	Nominal Switching Capacity: AC 8A/250V, DC 5A/30V Output: NO, COM
		I/O Interface: I²C, GPIO Terminal Block	
	Gas Sensor		Type: Single Instant Diffusion and Burning Type
			Appropriate Gas: LPG, LNG
			Alarm Indication: Yellow LED Flashes and Alarm Sound
			Output: DC8V(when alarm)
	Gas circuit breaker		Shut-off Method: Geared Motor
			Opening/Closing Speed: >10s | Current Rating: Max 500mA
	Light		Type: Downlight LED | Normal Voltage: 220V/60Hz
			Socket Size: E14 | Size: 250x140x110(mm)
	FAN		Normal Voltage: 220V/60Hz | Power Consumption: 13W
			Size: 166x166x84(mm)
Door	Edge Computer		CPU: Quad-Core ARM A57 @ 1.43 GHz
			GPU: Maxwell Core 128EA
			Memory: 4GB 64-bit LPDDR4 25.6 GB/s
			Storage: MicroSD (64GB)
			Video Encoder: 4K@30 | 4x 1080p@30 | 9x 720p@30 (H.264/H.265)
			Video Decoder: 4K@60 | 2x 4K@30 | 8x 1080p@30 | 18x 720p@30 (H.264/H.265)
			Camera: MIPI CSI-2 DPHY Lanes
		Connectivity	Dual Band Wireless Wi-Fi 2GHz/5GHz Band, 867Mbps, 802.11ac Bluetooth 4.2 | Gigabit Ethernet
			Display: HDMI and Display Port
			USB: 4x USB 3.0, USB 2.0 Micro-B
	XNode Auto		High Performance 32-bit 76.8 MHz ARM Cortex®-M33
			RAM: 128KB / Flash Memory: 1MB
		ZigBee 3.0	Frequency: 2.4GHz Range: Max 3200m (Outdoor), Max 90m(Indoor) Data Rate: 250kbps Sensitivity: -103dBm Output Power: 19dBm Receiver Sensitivity: -100 dBm Bluetooth Support
		Light Sensor	Illuminance: 1 ~ 65535(lx) Interface: I²C
		HUMIDITY & TEMPERATURE Sensor	Humidity Resolution: 12bit(0.04%RH), 8bit(0.7%RH) Humidity Accuracy: +-3%RH Temperature Resolution: 14bit(0.01C), 12bit(0.04C) Temperature Accuracy: +-4°C Interface: I²C
		Motor Driver	Up to 46V/4A | 3.5mm Terminal Block
		Relay Control	Nominal Switching Capacity: AC 8A/250V, DC 5A/30V Output: NO, COM
		I/O Interface: I²C, GPIO Terminal Block	
	Light		Type: Downlight LED | Normal Voltage: 220V/60Hz
			Socket Size: E26 | Size: 270x230x180(mm)
	Camera		Resolution: 1080p/30fps | Focus: Auto
			Lens: Full HD Glass | Field of View: 78° | Interface: USB
	PIR		Method: Passive Infrared | Operating Voltage: 10 ~ 15V
			Detect Zone: Max 12m
	Door Lock		Method: One Way Solution(Secret Code)
			Operating Voltage: 8V
	Pixel Display		CPU: Broadcom BCM2711, Quad core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz
			Memory: 2GB LPDDR4-3200
			Connectivity: Gigabit Ethernet, Wi-Fi 2.4G & 5G 802.11ac, Bluetooth 5.0, BLE
			USB: USB 3.0 2port, 2.0 2port
			HDMI: micro-HDMI 2port (Up to 4kp60 Supported)
			Codec: H.265 (4kp60 decode), H264 (1080p60 Decode, 1080p30 Encode)
			Graphics: OpenGL ES 3.0
			Data Storage: 32 GB Micro SD | Color: Pixel RGB
			Pixel: 160 x 16 | I/O Interface: GPIO(Serial Protocol)
			SMPS: 5V/18A | Size: 1880x250x180(mm)
Frame			AC: 220V | AC-DC SMPS: 700W
			Type: Panel | Dimension: 1,880 x 2,130 x 300 (mm)