固高科技
GOOGOL TECHNOLOGY

GOOGOL AI Training Box

-- Embrace the Future of AI

固高科技
GOOGOL TECHNOLOGY

Content

01 Production Introduction

Product Introduction

- The AI box is a teaching product that's for artificial intelligence related majors.
- It integrates computing unit, 2D vision, 3D vision, robot arm, speech recognition, embedded sensors
- AI Scenarios: data collection, model-based reasoning

Features

- Integrated design
- 17 inches screen
- Keyboard and mouse

Hardware configuration

- Integrated edge computing unit
- 2D vision/3D vision, robot arm,
- voice module, embedded sensor

Software environment

- Linux OS
- Jupyter Notebook interactive programming environment

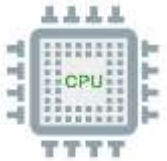
Product Introduction

固高科技 GOOGOL TECHNOLOGY

Edge computing unit

- NVIDIA Jetson Xavier NX processor
- Linux OS
- Software frameworks and SDKs
- Common communication interface

Parameters and functions



- CPU: 6-core NVIDIA Carmel
- Memory:8G;Hard disk:128G
- GPU: NVIDIA Volta Architecture, 384 NVIDIA CUDAcores and 48 Tensor cores
- Video Memory: 8GB128-bit LPDDR4x51.2GB/s
- Gigabit Ethernet; Display: HDMI and DP

- Built-in Python 3.5
- Machine learning and deep learning

- AI algorithm library: Object recognition, target detection, facial recognition, Speech processing

- Experiment： Machine vision, speech processing, robotic arms, and intelligent sensors

2D visual system

parameters and functions

- Pixel: 300000; Resolution: 640 × 480
- 90-degree wide-angle camera
- Frame rate: 30fps
- Focusing method: manual focusing

- Adopting a bracket installation, folding and storage

- Compatible with Ubuntu, Linux, Raspberry Pi OS
- Capture images of static targets in the field of view, perform basic image processing work
- Conjunction with a six-axis robot, visual calibration can guide the robot's movements, deploy a robot + visual execution system

Deep vision system

parameters and functions

- Minimum depth distance: 30cm
- Depth stream output resolution: 1280 ×720
- Deep stream output frame rate: 30fps
- RGB sensor resolution: 1920 × 1080
- RGB sensor frame rate: 30fps

- Real-time facial feature extraction, real-time analysis of faces appearing in the current field of view and obtaining facial feature data

- Support recognition and tracking of dynamic targets in the field of view, output processing results

- 2 million pixels depth motion sensing camera
- Ubuntu, Linux, Raspberry Pi OS
- USB 3.0 interface protocol
- Depth information perception, facial recognition

Speech recognition unit

parameters and functions

- Windows 10 and Linux systems
- Distance: 2 meters(indoor environments)
- 5 meters in quiet environments
- 360 ° surround picking mode
- sound source localization function
- Power supply: 5V

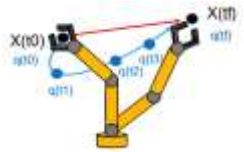
- Support user-defined commands and control robot, vision, sensors to perform specified actions

- Programmable microphone array module, plug and play
- Voice recognition, interactive intelligent speech recognition, sound source localization
- Acoustic sensors (microphones), sample and process the spatial characteristics of the sound field

Robotic arm

parameters and functions

- Payload: ≥ 200g
- Effective grasping range: radius ≥ 15cm
- 5 degrees of freedom with clamping arm



- Inverse kinematics control

- Control robot by voice, including up, down, left, right and grasping objects

- STM32 microcontroller for motion control
- "hand eye integration" robot vision system
- Flexible, adaptive recognition and grasping of objects

Embedded Sensors

parameters and functions

- Ultrasonic sensor
- Temperature humidity sensor
- Gyroscopes sensor
- Human detection sensor
- Heart rate sensor
- Air pressure sensor

- Unified communication protocol, sensors connected to the edge computing unit

02 Program resource

AI+...

AI + Visual Sorting

- Collaboration between robotic arm and visual system;
- Visual recognition based on deep learning;
- Appearance and size identification;
- Defect detection, part identification, electronic product identification.

AI + Depth Vision

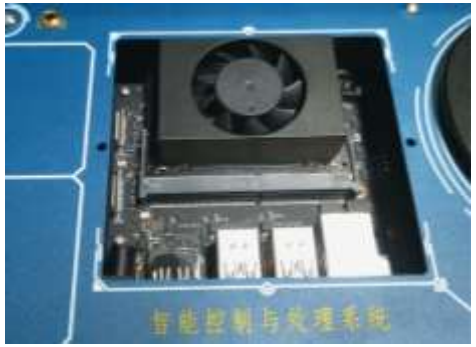
- Two degree of freedom gimbal + depth vision;
- Facial detection and recognition;
- Real time measurement of target distance;
- Motion target capture, recognition and tracking.

AI+ Speech Processing

- Microphone array, sound source localization;
- Voice control sensor to detect;
- Voice control of robotic arm movement;
- customized other voice commands and actions.

AI + Embedded Sensors

- Up to 12 kinds embedded sensors, including temperature and humidity, ultrasound, heart rate, air pressure, gyroscope, etc;
- Can be linked with other devices to build smart home or smart security scenarios.



Courses

courses

1.Python Programming

2.Machine Learning

3.Deep Learning

4.Digital Image Processing

5.Machine Vision

6.Depth Perception

7.Speech Recognition and sensors

8.Embedded Systems and Applications

9.Vision based robot applications

04 Scenarios

Scenarios

固高科技
GOOGOL TECHNOLOGY

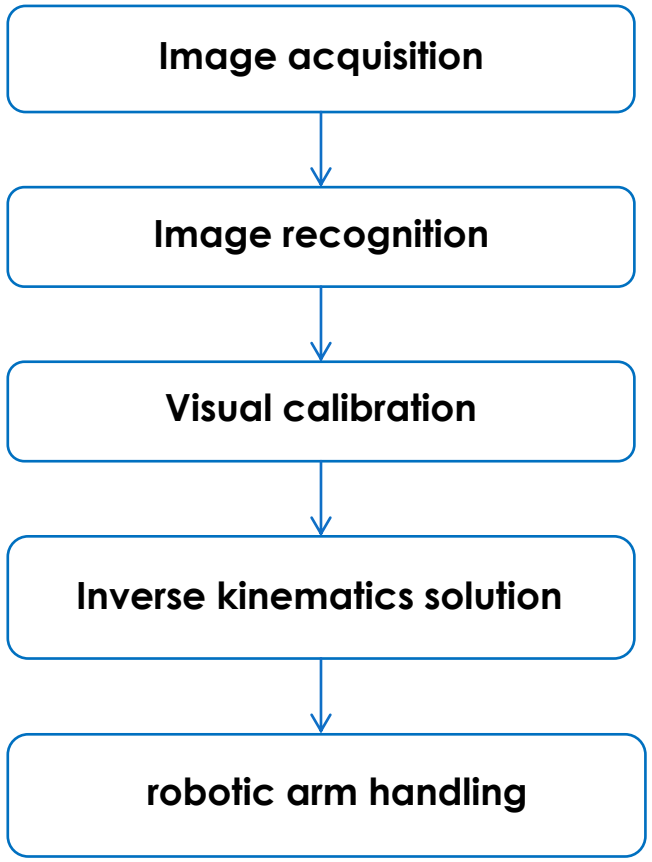
Cooperative Colleges

- More than 100 colleges…

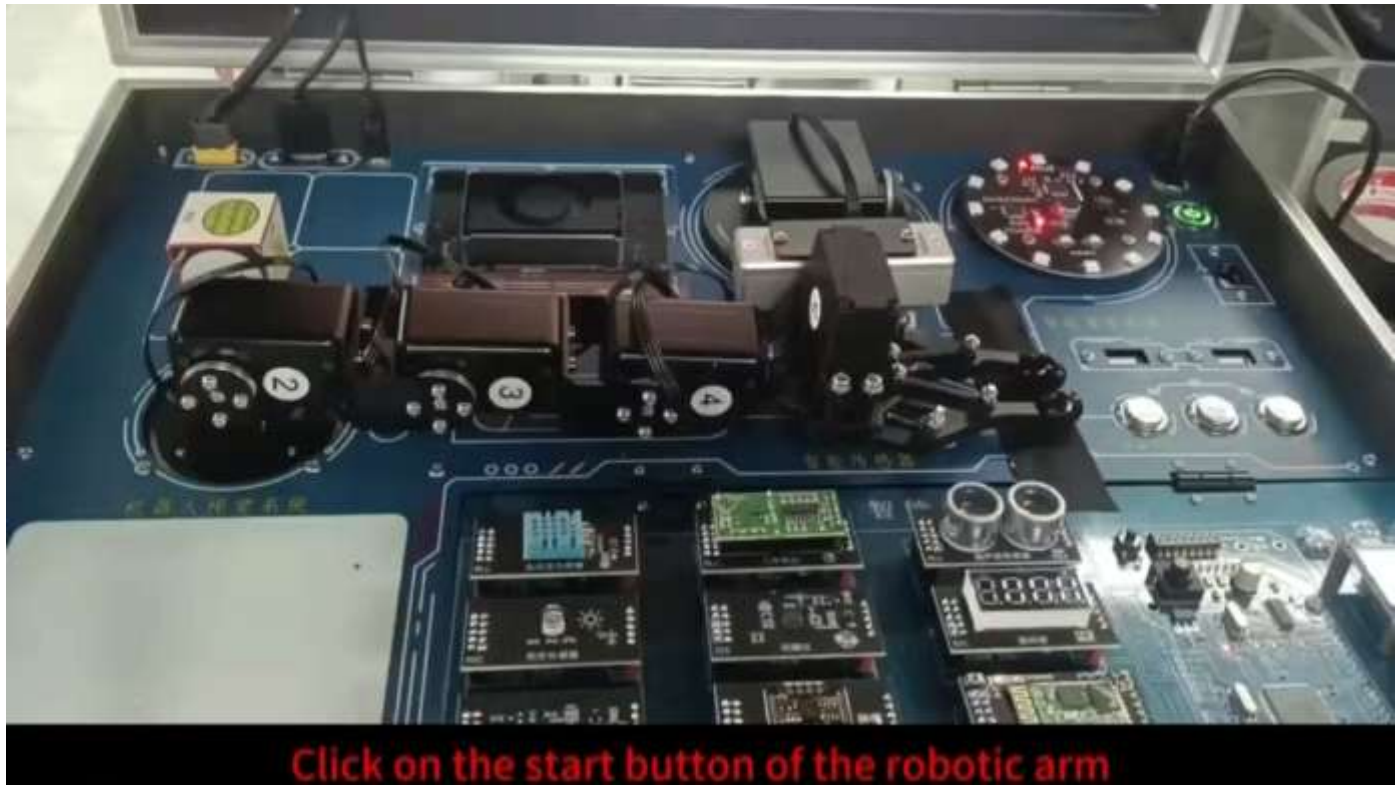
03 Demonstration

Demonstration

Experimental principle:



Below is a demonstration of "vision based robotic arm fruit classification" , based robot applications:



固高科技
GOOGOL TECHNOLOGY

Thank you!