

14. 3D Object Recognition

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14.1. Introduction

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MediaPipe is an open-source data stream processing machine learning application development framework developed by Google. It is a graph-based data processing pipeline used to build data sources in various forms, such as video, audio, sensor data, and any time series data. MediaPipe is cross-platform and can run on embedded platforms (such as Raspberry Pi), mobile devices (iOS and Android), workstations and servers, and supports mobile GPU acceleration. MediaPipe provides cross-platform, customizable ML solutions for real-time and streaming media.

The core framework of MediaPipe is implemented in C++ and provides support for languages such as Java and Objective C. The main concepts of MediaPipe include packets, streams, calculators, graphs, and subgraphs.

Features of MediaPipe:

- End-to-end acceleration: built-in fast ML inference and processing can be accelerated even on ordinary hardware.
- Build once, deploy anywhere: unified solution for Android, iOS, desktop/cloud, web and IoT.
- Ready-to-use solution: cutting-edge ML solution that demonstrates the full capabilities of the framework.
- Free and open source: framework and solution under Apache2.0, fully extensible and customizable.

14.2. 3D object recognition

Source code location:

/home/pi/project_demo/07.AI_Visual_Recognition/mediapipe/14.3D_object_recognition/Objectron_USB.py

```
3D object recognition: Recognizable objects are: ['Shoe', 'Chair', 'Cup', 'Camera'], a total of 4 categories; click [F key] to switch the recognized object.
```

```
If you want to exit the program, you can press q in the preview window or press Ctrl+C in the terminal to terminate the program!
```

Note: The following commands require vnc login to the car to run.

```
cd
/home/pi/project_demo/07.AI_Visual_Recognition/mediapipe/14.3D_object_recognition
```

python3 Objectron_USB.py

