15. Paintbrush

15.1. Introduction

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.

15.2. Paintbrush

Source code location:

/home/pi/project_demo/07.AI_Visual_Recognition/mediapipe/15.Drawing_tool/VirtualPaint_USB.py

```
When the index and middle fingers of the right hand are combined, it is the
selection state, and the color selection box pops up at the same time. When the
two fingertips move to the corresponding color position, the color is selected
(black is the eraser); when the index and middle fingers are separated, it is the
drawing state, and you can draw anything on the drawing board.
```

```
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.

```
cd /home/pi/project_demo/07.AI_Visual_Recognition/mediapipe/15.Drawing_tool
```

```
python3 VirtualPaint_USB.py
```


frame

Red
FPS : 10

(x=617, y=254) ~ R:20 G:26 B:24