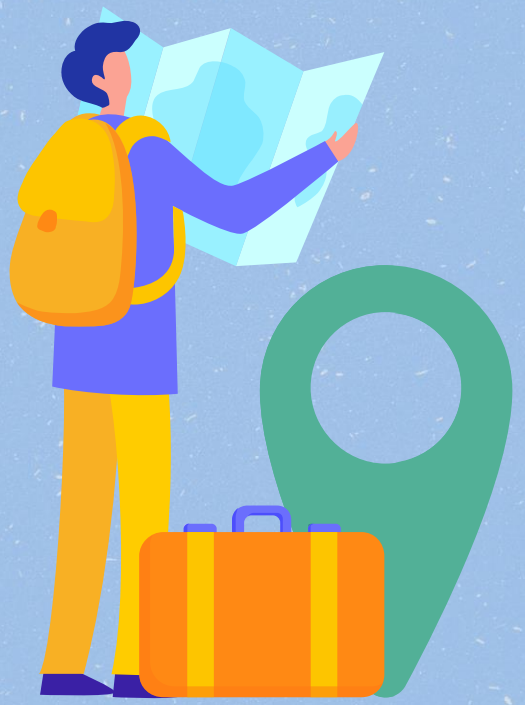
大疆教育

二阶第3课
图像识别

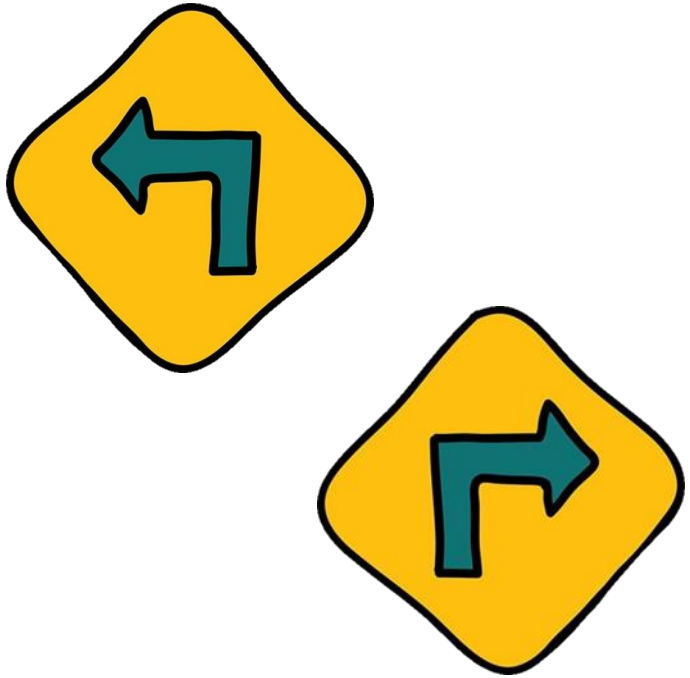
RoboMaster 进阶课

目录



课程引入

我能否跟着图像所指方向行走呢?



When I walked out of the chamber, I found many pictures with directions around me, try to identify them, is it possible to follow the direction show in the image points ?

我走出密室发现周围有很多带有方向的图片，尝试对这些图像进行识别，我能否跟着图像所指的方向行走呢?

1 PBL

思路引导

1、Do you know the traffic instructions on the road?

2、How are you going to walk according to the traffic signs?

3、How do you identify traffic signs?

1、你认识马路上的交通指示吗?

2、你要如何根据交通指示牌行走呢?

3、你要如何识别交通指示牌的信息呢?

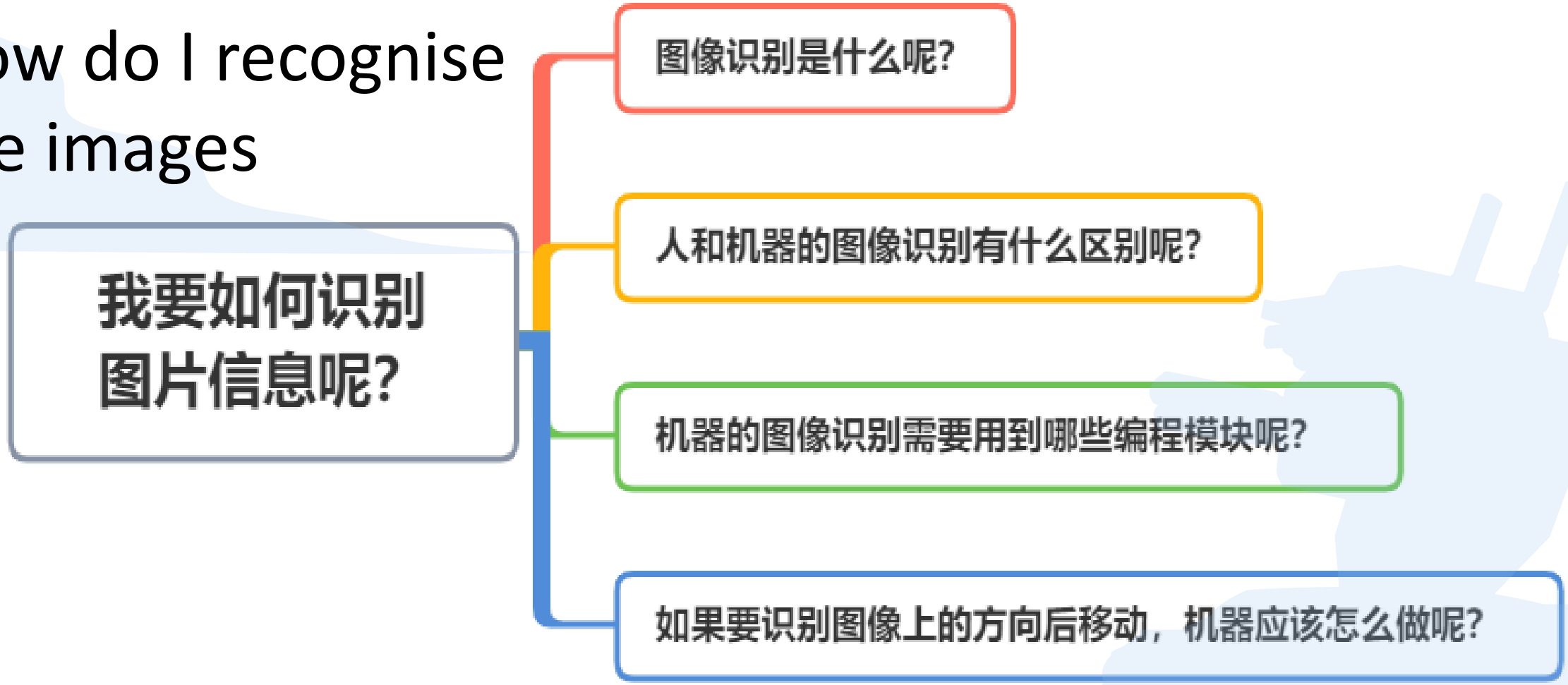
提出问题

Problem Based Learning

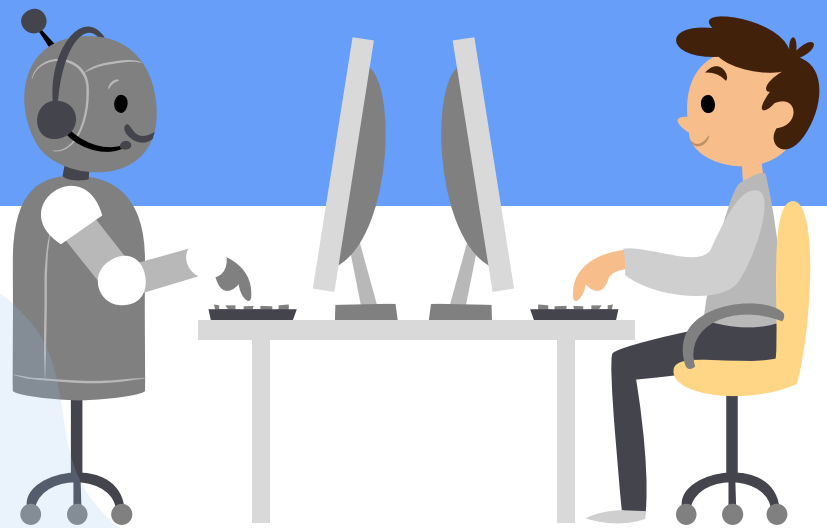
我要如何图像识别呢?

思考分析

How do I recognise the images



2 理论学习



背景知识

人是怎么识别图像的呢?

思考：机器是怎么识别图像的呢?

Image 图像

Perception 感知

Understand 理解

箭头

Image recognition is a technique that uses computers to process, analyze and understand images to identify targets and objects in different modes.

图像识别是利用计算机对图像进行处理，分析和理解，以识别各种不同模式的目标和对象的技术。

硬件学习

EP Robot又是怎么识别图像的呢?

图像 → 感知 → 理解 → 箭头

EP Robot通过摄像头发现视野中的Marker后，通过控制器完成对Marker的图像处理和识别并将信息传输至APP端，最终我们便能够编写程序使用Marker完成一系列自动任务。

硬件学习

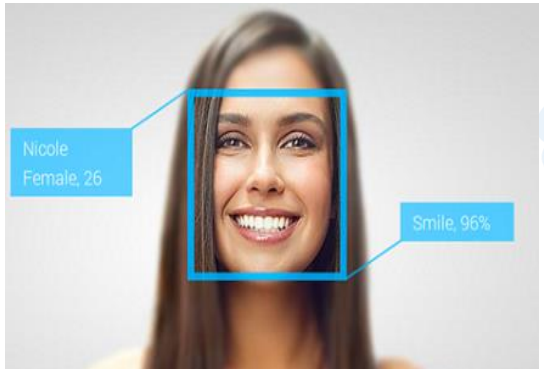
图像识别的应用

思考：在生活中，你还知道哪些地方应用了图像识别吗？

交通摄像

移动支付

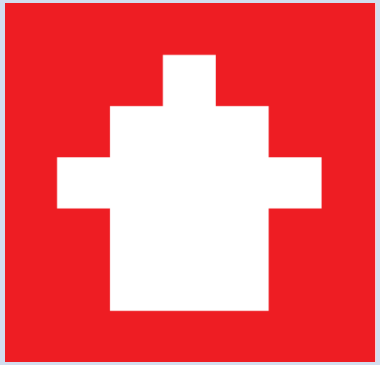
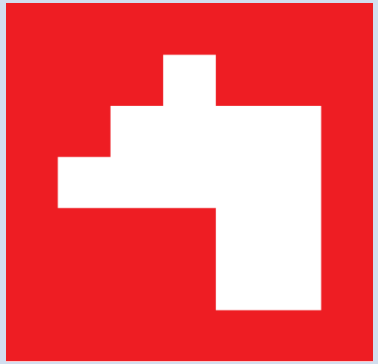
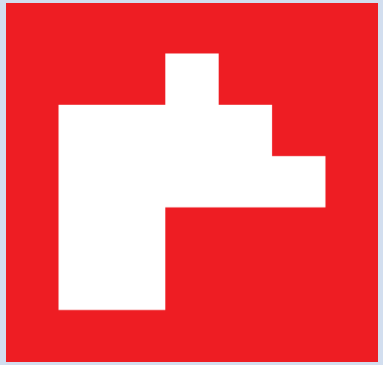
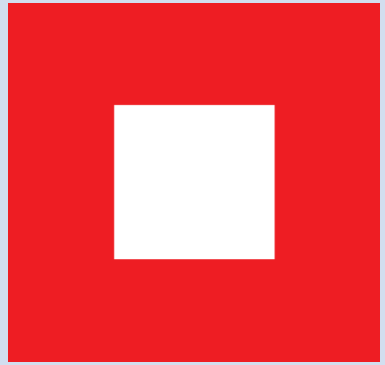
人脸识别



商品扫描

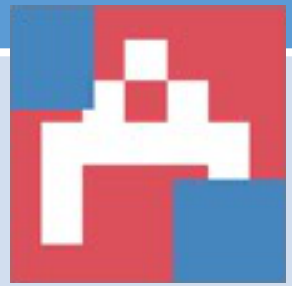
硬件学习

视觉标签-方向

直行箭头	左箭头	右箭头	停止
			

硬件学习 Hardware Lesson

影响图像识别的因素 Factors that affect image recognition

Perspective	Movement too fast	There is not enough light	Occlusion
			
The visual label tilts at a large angle, Perspective error occur, four	The robot moves too fast, caused blurring of the view, and EP Robot image	Insufficient light can cause red to be too dark, which can be inaccurate when	EP Robot does not recognize the label content when the visual label is obscured

编程模块

智能模块

Turn on or off RoboMaster robot's visual recognition of visual tags, postures, pedestrians, or similar robots

Note: RoboMaster EP's smart recognition feature is turned off by default, so the robot will only respond to the appropriate identifiable information if the recognition function is turned on first.

编程模块

智能模块

Return true when you recognize the corresponding information such as objects, visual labels, poses, etc., otherwise you will return false

3 实践任务

安全防护

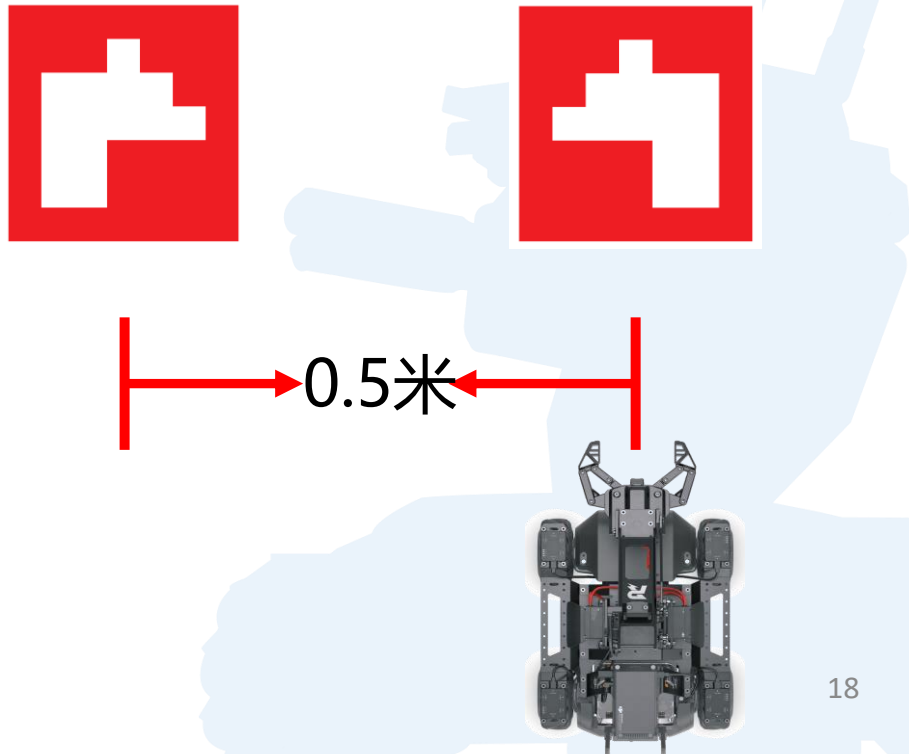
- Protect yourself and wear goggles;
- Protect the machine, take it lightly;
- Protect others and avoid pedestrians;

制定方案 Develop a plan

- EP Robot recognizes the direction of the visual label arrow and the control chassis pans 0.5 meters in the direction of the visual label arrow

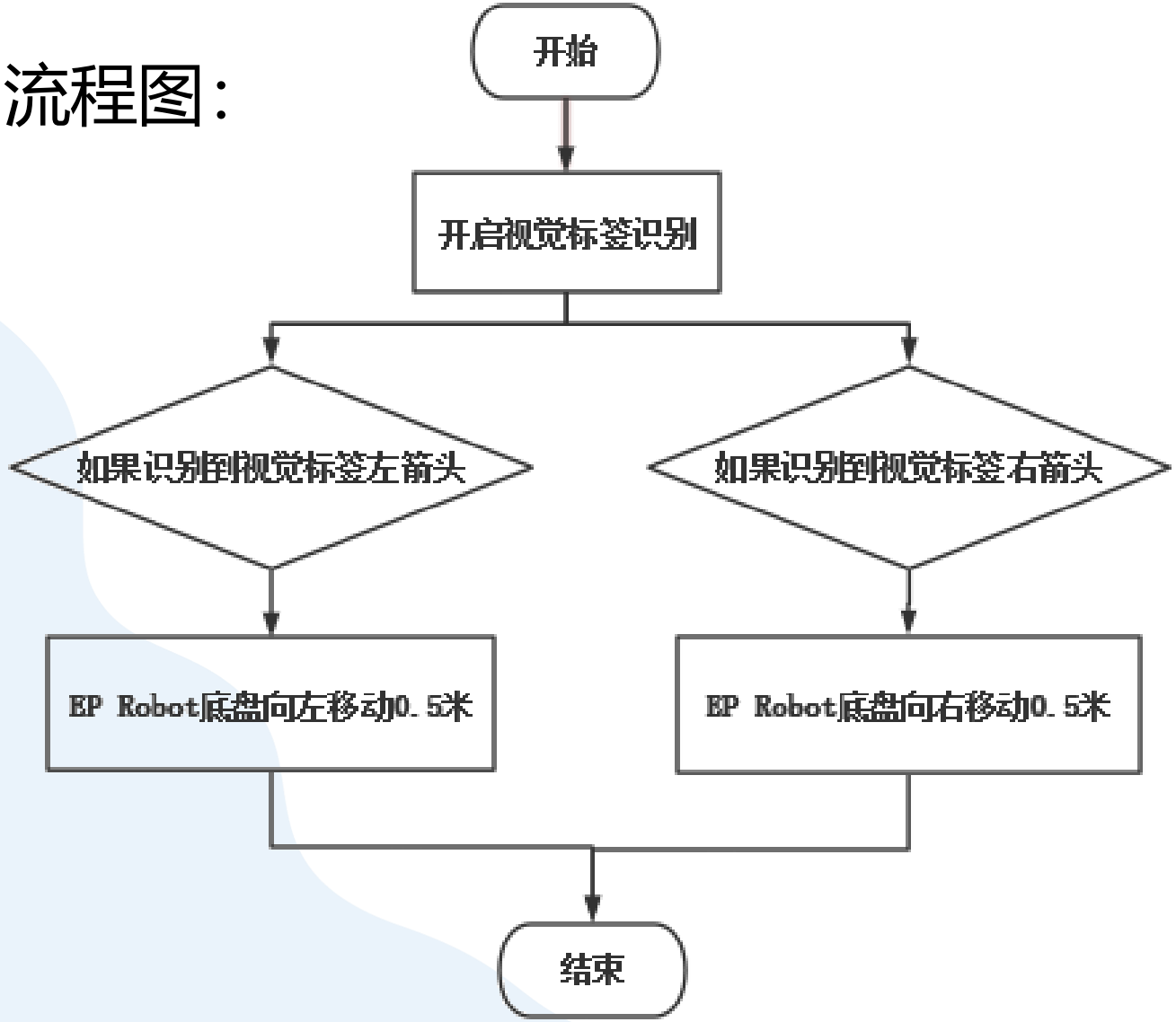
1、Set the direction of the EP Robot recognition visual label arrow;

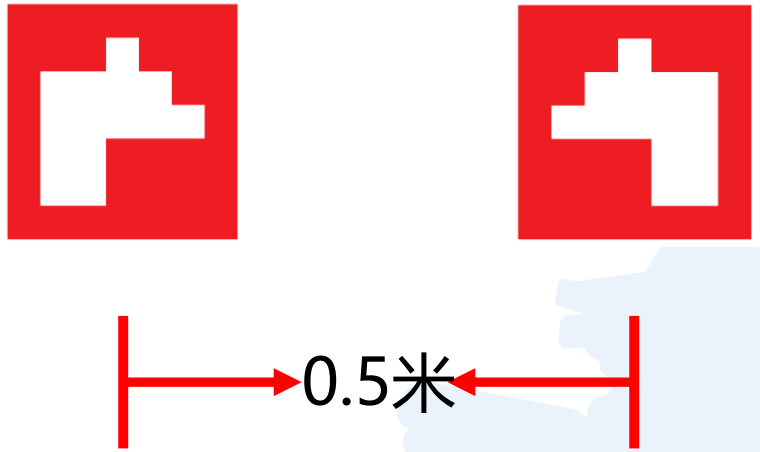
2、Set the chassis to pan 0.5 meters in the direction of the visual label arrow;

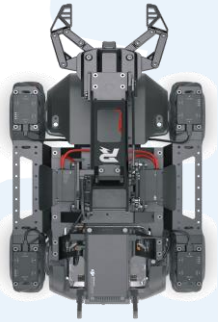


实践操作 (20min)

流程图：







鉴定成果

参考程序：


开始运行
开启
视觉标签
识别
一直
如果
识别到
左箭头
然后
控制底盘向
-90
度平移
0.5
米
等待
1
秒
如果
识别到
右箭头
然后
控制底盘向
90
度平移
0.5
米
等待
1
秒

拓展延伸 Further Challenge

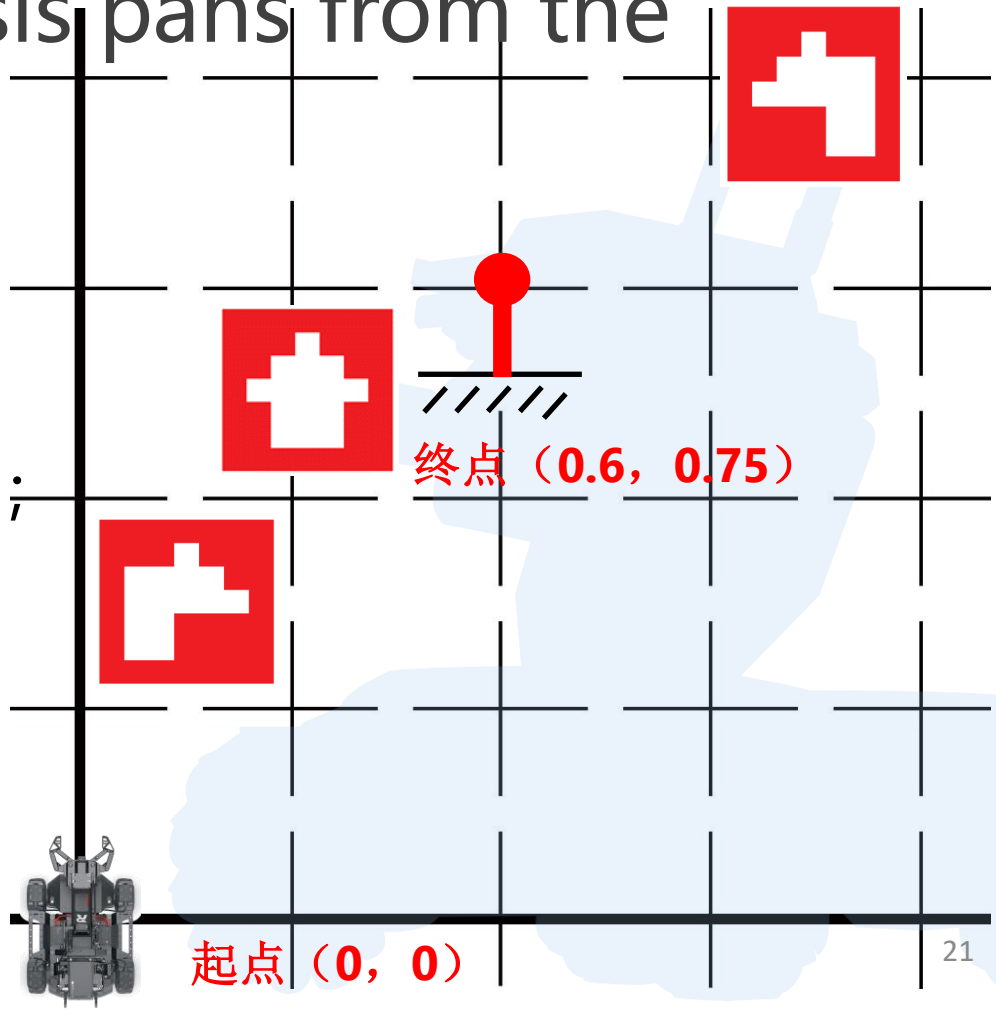
- The EP Robot recognizes the visual label arrow pointing and the control chassis pans from the start to the end point

1、Pan to the end in the fastest way and speed（0.6，0.75）；

2、Place EP Robot at the starting point (0,0).;

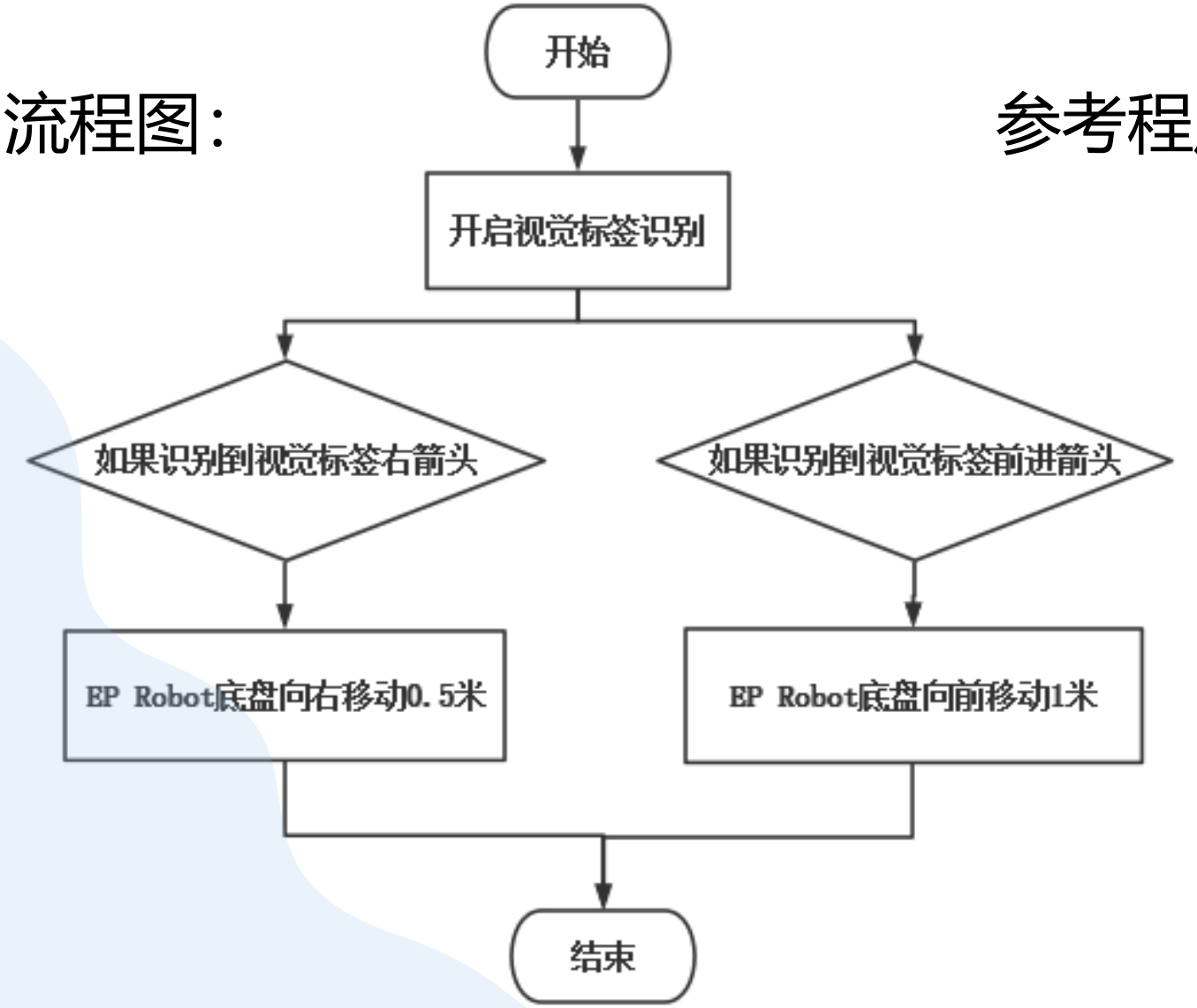
3、Set the direction of the EP Robot recognition visual label arrow;

4、Set the chassis to pan in the direction of the visual label arrow；



拓展延伸

流程图：



参考程序：

工程日志 (Day3)

Mission	EP Robot识别视觉标签方向，控制底盘随视觉标签箭头方向平移
Question	我要如何识别图片信息呢?
Solution	运用智能模块，通过编写程序，EP Robot识别视觉标签箭头方向，控制底盘随箭头方向平移
Keypoint	硬件：底盘、摄像头 编程：智能模块、底盘模块、控制语句

谢谢观看

RoboMaster 进阶课