

Lab03

1 Introduction:

The purpose of this lab is to practice embedded application development. There are various I/O interfaces on the E9V3 board, you need to use some of these interfaces to develop an application. The basic requirement is to get input, process it, and generate an output that may be used for a certain predefined purpose. For example, taking a video signal, processing it, and do something based on the processed result. In this lab, you need to implement a system that performs object detection task.

2 Requirements:

2.1 Successful and accurate identification of items. (40%)

1 kind	10 points
3 kinds	15 points
5 kinds	20 points
7 kinds	30 points
9 kinds and more	40 points

2.2 **2.2 Performance:** Class-wide ranking, requiring identification of 3 or more kinds of items for performance comparison. **The primary focus for evaluation is on students' ability to accurately determine the quantity of item categories rather than the time taken for recognition.** (32%)

2.3 Utilization of a camera for identification of items: identification of keyboard, mouse and screen; identification of one kind at the same time earns 6 points, two kinds earn 12 points, three kinds earn 18 points. (18%)

2.4 Report. (10%)

You also need to hand in a report (either in English or Chinese) that describes your system, including how you implement object detection. It does not need many pages but should be concise and easy to understand by readers.

2.5 Upload your source code to E3.

3 Notes:

3.1 **We will provide an additional image (hidden case) for students to use as a test for their program.** It is also recommended to save the resulting image on the SD card.

3.2 For **Requirement 2.3**, you need to display the result on the monitor (HDMI or LCD).

3.3 You can prepare different programs for each requirement.