ECPS 203 Discussion Week7

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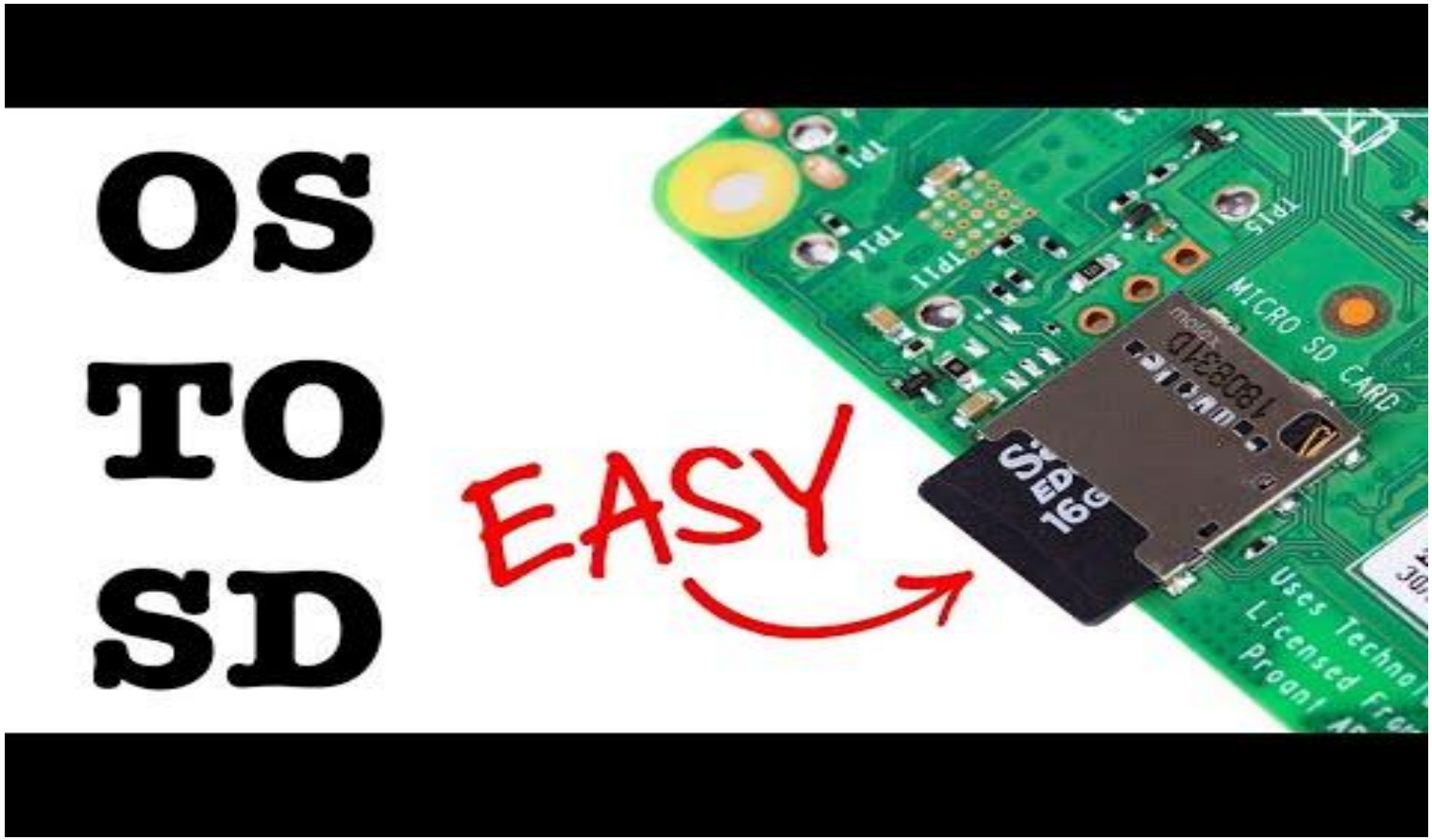
Outline

- Assignment 7
  - Performance measurement of the Canny Edge Detector on prototyping board
    - Prepare your prototyping board
    - Compile the Canny C++ application
    - Instrument the source code with timing measurement instructions
    - Note the delays of the major Canny functions

Install Raspberry Pi OS to your Raspberry Pi

- Recommend that you make a backup of your Raspberry Pi SD card before proceeding with this step.



Compile Canny C++

- Copy the source file `Canny.cpp` and the input images to your Raspberry Pi
  - Use **assignment 4** source code (`CannyA4_ref.cpp`)
  - Using USB flash drive or try connecting your Raspberry Pi to the network
- Open the terminal
- `cd ~/project/hw7`
- `g++ -Wall canny.cpp -o canny`
- `./canny`

Timing measurements

- Use **time.h** library to measure run time of all major Canny functions
  - Gaussian_Kernel, BlurX, BlurY, Derivative_X_Y, Magnitude_X_Y, Non_Max_Supp, Apply_Hysteresis
- Example

```
#include "stdio.h"
#include<time.h>
using namespace std;

int main()
{
	clock_t start_time=clock(); //clock() returns the elapsed clock ticks since the start of the
	                            //program
	f();
	clock_t end_time=clock();
	printf("running time = %f ms\n",(double)(end_time-start_time)/CLOCKS_PER_SEC*1000);
	return 0;
}
```

Report measured delays

- Measure the real-time delay of all the functions in the Canny
- Note that each function may report multiple values, hence calculate the mean value of these measured delays and report them

Homework Submission

- Submit **canny.cpp** and **canny.txt**
  - the Canny C++ model with timing instrumentation
  - a brief text file with the table of measurement results

Questions?

- “The reason universities have students is so they can teach the professors”

John Wheeler

“No Ordinary Genius”, p44.