

ESLab HW2

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Reports with several issues and solutions presented. You may clone the project and configure per the instruction.

GitHub link: <https://github.com/NOOMA-42/NTUEE-ESLab.git>

0.1 general approach

To better learn how to build up a project, I start with blank project instead of copy files from sensor to socket and separate class into different files. For server I build the server.py and local testing client.py.

0.2 project structure

I found out include folder [4] is important to cleaner code. I separated sensor and socket into 2 classes and input sensor method as a function argument in socket run method. Server runs on my laptop and initialized 2 processes - function animation and socket which utilized message queue to communicate. but don't know how does the compiler know this file yet

1 Miscellaneous Learning

1.1 ifconfig

I learn this linux command for I needed to connect the server and mbed through WIFI. Second reason pushed me to learn it is that I built mbed and server asynchronously, that is to say, I might not be able to test server with mbed. Under this circumstance, I'd like to test it over the localhost. I learnt localhost is 127.0.0.1 through ifconfig as well. [2]

1.2 import new library

Initially I put sensor files and folder into socket folder directly and seems not to work, and it turns out that intellisense fail to recognize. I

1.3 coding style

I personally think minimal-printf [3] introduced in STM32-IoT-Node-Onboard Sensors.pdf can be modified in a better coding manner. [1]

1.4 Pass in function pointer

I found out the most tricky part in combining socket and sensor is to pass the function pointer to socket class. It took me a lot of time to figure out how to convert the utterly complex pointer and function mixture type into acceptable format. I finally dealt with this issue with this article [6]. It seems this is not the only solution. I listed following two other solutions (I haven't tested it)

solution2: static member function <https://blog.csdn.net/u010982765/article/details/79021426>

solution3: functional C++11 or lambda <https://www.geeksforgeeks.org/passing-a-function-as-a-parameter-in-cpp/>

2 Potential Improvement

Global config file, deployment as a webpage. Understand "constexpr" keyword in socket source file and the difference between typedef and define c [5]

References

- [1] ARM. configuration-parameters-in-mbed-app-json-mbed-lib-json. <https://os.mbed.com/docs/mbed-os/v6.15/program-setup/advanced-configuration.html>.
- [2] ARM. how-to-check-local-network-ip-address. <https://forums.mbed.com/t/how-to-check-local-network-ip-address/8696>.
- [3] ARM. Minimal printf. <https://forums.mbed.com/t/float-printf-doesnt-work-in-desktop-version/9164/2>.
- [4] Nicol Bolas. why-create-an-include-directory-in-c-and-c-projectswhy-create-an-include-directory-in-c-and-c-projects. <https://stackoverflow.com/questions/48554758/why-create-an-include-directory-in-c-and-c-projects>.
- [5] geeksforgeeks. typedef v.s. define c. <https://www.geeksforgeeks.org/typedef-versus-define-c/>.
- [6] Annie Kim. 恼人的函数指针（二）：指向类成员的指针. <https://www.cnblogs.com/AnnieKim/archive/2011/12/04/2275589.html>.