INSE 6170 Course Project Information

Default Project Description:

In this project, you are expected to develop a smartphone app or computer software which acts as an access point for IoT devices. When you turn on the hotspot of the phone or computer and allow IoT devices to connect to the Internet, the app/software can detect all connected IoT devices. You are expected to add the following functions to the app/software:

1. List all connected IoT devices which use your phone/computer as hotspot. The list should show the Ipv4, Ipv6, Mac address, vendor if they are available. You could find the vendor information based on their MAC address.
2. You can edit the information of the devices to add information such as name, vendor, model, version etc, and save them into the device.
3. You can capture some packets of some IoT devices in a batch. You can specify how many packets to capture and/or how long time to capture the packets. Save the captured packets as pcap files by one file for each device. You can specify the file names. You can pause or terminate the packet capture at any time.
4. Build a simple IDS in the app/software. If some IoT devices are behaving abnormally, for example, the data rate is more than twice (adjustable) of its average data rate, automatically log their traffic for 5 seconds and notify you by email or phone notification. You can use the moving average method to calculate its average data rate. Please make sure your alarm rate is not too high. You can check the data rate history of any IoT device for the last 7 days (note that I meant the data rate, not all the packets).
5. You can delete partial or all saved files or records.
6. You can add any other functions that you believe to be necessary or desirable. You may get bonus points for extra functions you add.

The project demo will be accessed by its UI design, functionalities, correctness, and ease of use. You can work individually or form a team of 2 to 3 people. You are expected to provide your own devices and tools for the project. A project proposal is expected in about one week after this project is posted. **A progress demo will be scheduled on Nov 22nd, and the final demo will be scheduled on Dec 6th. The final project report will be due on Dec 16th (tentative).**

Project Proposal Guidelines:

You are expected to write a one-page (or approx. 600 words) project proposal for either the default project or the project of your own choice.

If you are working on the default project, you should provide a plan on how to implement the app/software. For example, you can specify your preference of platform (app or software), whether you plan to start from scratch, or work on top of another project. A preliminary design of the app/software architecture design would be great. Each person writes their own proposal. You are not required to have a team at this stage.

If you choose to work on your own project, which should be related to your thesis, the project proposal should contain background, the related work, the methodology, and the timeline. You are expected to work alone if you choose your own project.

Project Report Guidelines:

Your final project report submission should contain the following files: the project report in pdf format, the necessary source-code files (.java, .c, .py etc.), any other relevant files including the source files of the report, data files, and instructions to run the code.

Your report should contain background information, motivation, the related work, the design, how the project is implemented, results with figures, conclusion, and references.

Project Report should be written in Overleaf (Online LaTeX Editor) and the pdf should be the results of a compiled latex source files. The style of the project report should be the IEEE conference style (double column). The minimal number of pages for the project report is 6.

Important Notes*: Generative AI shall not be used in any of your writings submitted for evaluation for this course. Plagiarism is also strictly forbidden. You must cite your work properly. A violation could lead to a failed grade of this course. If you have questions, do not hesitate to contact Dr. Fung <carol.fung@concordia.ca>.