Q1 Enviro sensing HAT Concept [5]

Describe what your HAT’s use case is, what it will attach to and in what scenario(s) someone would use it?

Light sensor that works in conjunction with the STM32 Board.

It can be used to detect and monitor light intensity throughout the day and this data can be stored externally and be analyzed for determining the light intensity conditions where the sensor is. This can provide information such as the maximum and minimum light intensity experienced during the day. By placing the sensor at various conditions, the recorded data can be used to find the optimum location for a specific use.

The HAT will also have a digital sensor which will measure the battery percentage of the device. This value can then be displayed on the LCD screen of the STM32 board.

Q2 Requirements [10]

The lecture discussed how one approach to capturing requirements is to think through the user stories that apply to a product/system/device. List 3 user stories that apply to your concept. These could be 3 different ways or reasons someone would use your HAT, eg 3 different situations it would be useful in, or even better would be if you can think of 3 different types of user and how they would use your HAT. Write down each use case scenario or user role and list at least 3 requirements derived from that role/scenario. The template shows 3x3 but put as many requirements and roles as you see.

User role/Scenario1:

In a water purification plant, the water can be run through a glass tube with a light on one side and a light sensor on the other. Depending on the amount of light that passes through the water, the water quality can be gauged.

* Compact
* High Accuracy
* Affordability

User role/Scenario2:

The device can be used to measure the quality of glass in a glass production line. Depending on the value of light intensity that passes through a pane of glass, the glass can be categorized.

* High Accuracy
* Affordability
* Robust

User role/Scenario3

The device can be used by subsistence farmers to find the optimal position in their plot to grow specific varieties of plant depending on the lighting conditions that there plants thrive in.

In this case the device will be placed out-doors therefore the onboard battery and battery level sensor will be useful.

* Battery Powered
* Robust
* Affordability

Q3 Project Subsystems Block Diagram [5]

Break development of the HAT into subsystems that can each be developed and tested independently. Provide a block diagram of your HAT indicating the subsystems and key modules/components within each here first. Provide sufficient labels on this diagram that another electrical engineer would be able to skim it and know what each modules’ primary function is, how they interface with each other/connect up and what the HAT as a whole does