P542 Hardware System Design II

Lab Report 5

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Description of solution

A *while*(1) with a *non_blocking_getchar*() to listen for ‘t’ or ‘T’ and a check of systick_flag. If systick_flag is set, then call scheduler. On the scheduler I sample at two different rates: 10hz and 1 hz. At 10 hz obtain samples from the gyro, accelerometer and magnetometer with respective counters to keep track of the number of samples. At 1 hz, output the respective averages and reset the counters and buffers.

If a ‘t’ or ‘T’ is received, then I handle the user input, one piece of information at a time. I first prompt the user for the month, then day, year, hour minute and seconds. For each data, check that the number is of a valid range and then update the RTC structure.

Description of issues

The main issue was to obtain the data from the UART using interrupts. Once that was setup, it was easy to build the assignment. A secondary issue was validating the data obtained from the user via UART to make sure that an integer with appropriate range was received (e.g., an integer from 1 to 12 for the month). For that purpose, I developed a function char * get_line_from_user() to read an entire line from the UART which then gets parse to an integer by strtol().

Block Diagram for the Project