# MCTX3420 Team 4: Progress Report #7

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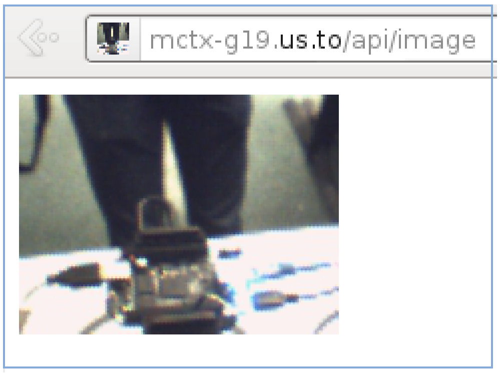
**Work Done:**

1. Added warning and error thresholds to sensor sanity check function
    a. Not yet handled in GUI
2. Refactored server code to abstract data operations from sensor/actuator control
    a. Files *data.c* and *data.h* contain functions for saving, loading, displaying data
    b. DataFile structure wraps around access to binary files
    c. Sensor and Actuators can both use this functionality
        i. Actuator settings are saved in the same format (time,value) as Sensor readings
3. Refactored server code to simplify user parameter parsing
    a. FCGI module now has dedicated function to parse user parameters based on expected key/value pairs and the expected type of the value
4. Distinguish between individual experiments and allow for stop/start/pause/resume control
    a. Sensor/Actuator control threads get stopped and started as necessary
    b. DataFile(s) closed/opened as necessary
5. Wrote program to generate and process test interferometer images
    a. Uses *OpenCV* image processing library in C (compatible with main server code)
    b. Takes image with actual camera, adds a sinusoidal pattern similar to interferometer pattern
    c. Identifies nodes in the sinusoidal pattern and uses these to calculate change in phase between images
    d. Integrate changes in phase to get total change in phase, proportional to expansion of can
6. Streamed of images through server directly to client instead of saving on disk
7. Set up debian on BeagleBone in G19
    a. Base image: From http://www.armhf.com
    b. Packages: *nginx, spawn-fcgi, gcc, libssl-dev, libfastcgi-dev, git, make, libopencv-dev, valgrind*
    c. Remote access through address *mctx-g19.us.to (HTTP, SSH)*
    d. Network connection is intermittent, possibly due to insufficient power through laptop USB
        i. Connectivity was improved using a desktop USB
8. Work on reading/writing using real pins on BeagleBone
    a. Can control a LED using server API
    b. GPIO / ADC currently separate from main server code; needs testing

**Work Todo:**

1. Reading/writing using real pins on BeagleBone
    a. Test and integrate with main server code
2. GUI - Design needs a lot of work
    a. Periodically check log file for errors to display to user
    b. Input boxes for actuator control settings
    c. Add graphs of actuator  values  vs sensor values
    d. Page to control experiment (start, stop,.pause, resume, set experiment name)
2. Test image related code (OpenCV) on BeagleBone
3. Minor improvements to server code as necessary
    a. eg: Save log to file which is accessible to GUI (for point 2a)



mctx-g19.us.to/api/image

Figure 1: Image from Logitech webcam transferred through BeagleBone server

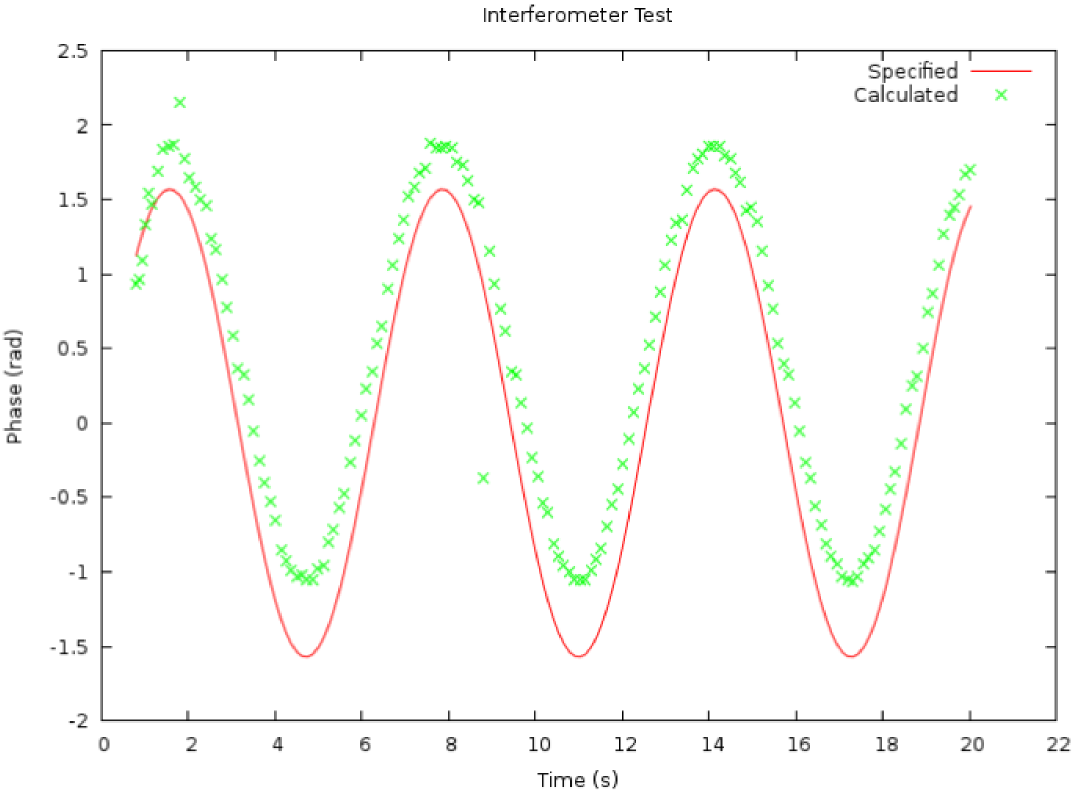


Figure 2: Sample output from interferometer test program

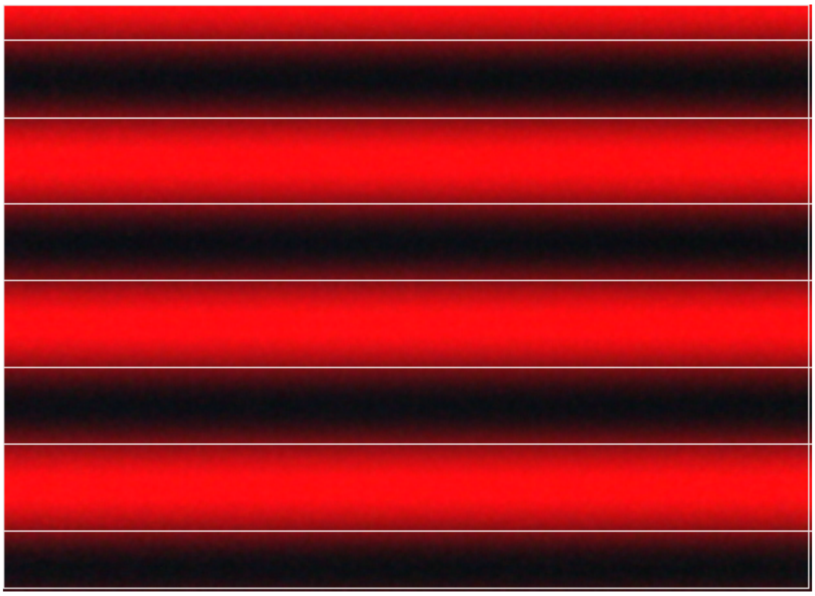


Figure 3: Image generated by interferometer test program. Nodes are identified with white lines.