Where I left off last week: Last week I was working on implementing the flexural rigidity program into LabView and to make it output all data without additional processing by the user. This was completed successfully by the start of this week. The program successfully repeated the data processed during the pilot trials and output the results to the user both graphically and in tabular form. I had also begun the abstraction and implementation of the transmural strain subroutine.

Difficulties last week: Last week was a difficult week because implementing Matlab scripts into LabView Vis has many hidden pitfalls. Most of the problems incurred during the transition were carried over into the current week and will be discussed below.

Comments from last week’s team meeting: No comments this week. Every effort is being made to meet all required specifications by the deadline.

Actions this week: This week I continued working on the abstraction and implementation of Matlab subroutines into the LabView environment. I have successfully completed both tasks at this point; all that remains is testing the Vis in real time using the input from the CCD camera. The resulting VI block diagram and front panel can be seen below in Figure 1. The VI works by calling all Matlab functions and scripts within a special script subVI. This format allows for m-files to be called directly and even allows for high level graphical outputs, such as “fill” and “patch” to be run in real time. The result is that the user receives immediate graphical feedback from the tissue test.

Based on the success of integrating into the LabView environment, I worked on adding a special feature to the graphical output. I built in a color smoothing effect to the meshed output. This gives the feel of a commercial finite element output and should be a more powerful tool for data analysis. A comparison between output with and without the new color blending subroutine can be seen below in Figure 2.
Figure 1 – LabView front panel and block diagram showing the abstraction and implementation of Matlab subroutines for the calculations associated with transmural strain.
Figure 2 – Transmural strain graphical output before and after smoothing subroutine was applied. Magnitude of strain is shown, although results were similar for all strain displays.

Current Status: I am working with Xuan and Mike to integrate all physical and virtual components. Also, I am working on upgrading the graphical output to include a legend with max and min values displayed.