4F03 Analysis Report
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GPU and CPU Comparison:

The GPU execution of each of the images are faster than the sequential CPU execution, however the difference is not as much one would expect. The sequential CPU algorithm utilizes the sliding window and separable filter algorithm, whereas the GPU implementation only implements the separable filter algorithm albeit in a parallel fashion. The time for the CPU implementation decreases as the size of the image kernel increases which is demonstrated by the parabolic curve shown in Figure 1.0, that is plotted for each of the CPU curves. The same trend can be seen in Figure 1.0 within the GPU curves for each of the images; as the size of the kernel increases, the slope of the curves can be seen to be decreasing. I attribute the decrease in slope to the separable kernel filter algorithm that I have used. I predict that as the size of the kernel increases, the sequential CPU execution may come quite close to, or even be less than the GPU time, due to the massive overhead cost for maintaining many threads.
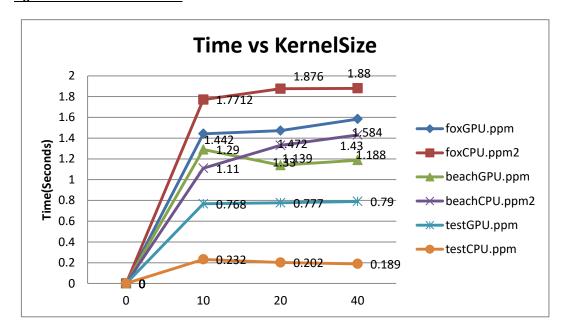
Figure 1.0 Time V.s Kernel Size