

## ***Executive Summary***

The purpose of this project is to construct a low-cost portable edge detection device. The device will acquire an image from a CCD camera through a serial port. The device will then process the image for edges using the Prewitt edge detection method. The output is then compressed and passed on to the user serially.

The team's original Gantt chart was modified early in the project to incorporate a more appropriate solution to the problem. This included a new processor, a different means of acquiring the image, and a compressed format for outputting the edge data. All tasks and milestones listed on the new Gantt chart were met. The team was successful at creating this device. All functional requirements were achieved or were within the acceptable margins of error. To correct the requirements that not completely satisfied are followed by suggestions on improvements.

The team was able to meet most all of the functional requirements successfully. These requirements include the price, portability, power consumption, and other design restrictions. Of these requirements, the power consideration was not met by simply using two AA batteries as anticipated. However, simply using a different kind of battery resolves this issue. The speed consideration of the device was not completely met either. The functional requirements state that the throughput of the device should be 5 to 10 frames per second. The implemented algorithm, however, has a throughput of just over 2 frames per second. The solution to this problem would be to utilize a slightly less complicated edge detection algorithm, or a faster processor.

The functionality of the device was verified using two software tools. VisualDSP++ 2.0, a tool which was provided by Analog Devices, was used to create and debug the code running on the main processor. A second tool was created by the team members to test the validity of the output of the edge detection algorithm.