Work Completed

Since our last meeting on September 12th, we have not accomplished quite as much as week one purely because of the fact that this week has been from Wednesday to Monday. Tim and Nate have been working on coming up with a LabVIEW program that can be loaded onto one of our personal computers and taken to Hartford Hospital for initial testing. I have been working with the LCD display and Blackfin chip in order to determine how to load our program onto the chip and display it on the LCD screen. On Friday, September 14th, we worked on powering up the LCD screen, and after supplying voltages based on the pin diagram that we have we were unable to yield any viable results. I contacted Toshiba (the manufacturer of the screen) to see if they had any sort of advice for me, and they told me to contact a local service center to resolve the issue, which I plan to do during the coming week.

Using the Visual DSP++ software I used a tutorial program to attempt to load a sample program onto the Blackfin chip. The program creates two random arrays, sorts them, and then displays them as a graph. Figure 1 is the beginning of the program used.

```c
/*
 * Getting Started With the ADSP-BF537 EZ-KIT Lite
 */

#define WIN_ITERATIONS 1
#define ARRAY_LENGTH 128

/* initialize two arrays to the same set of random values */
void random_arrays (int *a, int *b, unsigned int length)
{
    unsigned int i;
    for (i = 0; i < length; i++)
    {
        a[i] = 2 * i - rand() % 1024;
    }
}

/* A standard bubble sort algorithm, (O(n^2)) */
void bubble_sort (int *a, unsigned int length)
{
    unsigned int i, j;
    for (i = 0; i < length - 1; i++)
    {
        for (j = i + 1; j < length - 1; j++)
        {
            if (a[j] > a[j + 1])
            {
                int temp = a[j];
                a[j] = a[j + 1];
                a[j + 1] = temp;
            }
        }
    }
}

Figure 1: Sample Blackfin DSP++ program
This program is located at the path: C:\Program Files\Analog Devices\VisualDSP 4.5\Blackfin\Examples\ADSP-BF537 EZ-Kit Lite\Getting Started Examples\Part_1_1 on all of the computers in the Senior Design Lab. After this program was loaded successfully I found a tutorial program in the “Getting Started with the NI LabVIEW Embedded Module for ADI Blackfin Processors” manual. This manual describes how to create a LabVIEW program and embed it into the Blackfin Processor. The LabVIEW front panel and block diagram used from the manual are shown in Figure 2.

Once this program was built and ready to be embedded onto the Blackfin processor, I was unable to load it onto Blackfin. An error message appeared saying that the license was unable to be obtained. Until I am able to fix the licensing issue associated with loading the LabVIEW program onto the Blackfin chip, I will be unable to make any more progress with programming Blackfin. I e-mailed Dave Kaputa to see if he knows how to resolve this issue, and I plan on contacting someone at Analog Devices if he is unable to assist me.
On Thursday, September 13th, I met with Dr. McIsaac at Hartford Hospital for our weekly meeting. Tim and Nate decided not to attend pending their meeting with Newton DeFaria. Dr. McIsaac gave me information needed for our budget, and I set up a meeting for next week. On Friday, September 14th, I went to Hartford Hospital to register as a volunteer in order to get a badge to enter the Hospital as I need to. I had to get a picture badge and take a computer orientation. This will be important for when we need to test our program with the GE Marquette system.

On Friday, September 14th, we met with Newton DeFaria, the regional representative for National Instruments in order to discuss our LabVIEW program. He gave us a lot of valuable information regarding what we need to do to communicate with the GE Marquette system, and many things we need to find out from Dr. McIsaac before we can progress much further. He suggested that we look into wireless communication via the hospital’s wireless network for the PDA, and find out if the Marquette communicates with UDP or TCP/IP. When we find out the answers to these questions we can further refine our LabVIEW program and progress even further.

Future Work

The next step in my work will be to contact someone at Analog Devices in order to fix the error associated with the licensing of the DSP++ software. Once this is done, I will be able to progress further with the Blackfin and determine how to integrate it with the LCD screen and any other peripherals that we might be using with our device. I will also be contacting Tops Electronic Service center in Haverhill, MA to obtain any missing parts and get professional assistance for our LCD screen. One of the main things I need to find out is whether or not the LCD screen we have is compatible with Blackfin. Once this is done and the LCD is working properly we will be able to test its integration with the Blackfin processor. I would also like to have our work with the LabVIEW program split between the group members so we can work more efficiently. On Thursday, September 20th, we will be going to Hartford Hospital to test the initial part of our LabVIEW program to see if it works in conjunction with the GE Marquette anesthesiology system.

Project Review

This has been a difficult week because we did not have a full week between our meetings to get a lot accomplished. We did however get a good start on our LabVIEW program from the information obtained from our meeting with Newton DeFaria. We are beginning to get a better idea of what needs to be accomplished overall in our project, and we should have a good deal of progress this week after talking to the necessary contacts related to each aspect of our project.

Hours Worked

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