Engineering Notebook

Richard Nelson

September 5, 2023

Started on the basics of the project and outlining the requirements. We agreed to use the Digilent Nexys A7 development board because everyone but me and two other group members have used them and were experienced with them. Also downloaded Vivado 2018.3

September 7, 2023

Today everyone played around with vivado, including me who never used it before. I loved the Ip block diagram

September 12, 2023

We defined the architecture, emphasizing the integration of a Xilinx MicroBlaze softcore CPU on the Artix 7 FPGA, and the FreeRTOS that would run the server. Vivado version was determined (which ended up being 2018.1), which was a pain to download again because it takes an hour, but it got done.

September 14, 2023

In today's meeting, the primary focus was on ensuring that all team members successfully installed and debugged Vivado, a critical tool for our FPGA development. Each team member had the opportunity to troubleshoot and debug their installations, promoting a uniform and stable development environment. I worked with Ryan Flinchum personally and completed it.

September 19, 2023

The team shared insights gained from individual research on FPGA, MicroBlaze, and related topics. This exchange of information proved valuable in refining our approach and ensuring a cohesive understanding among team members. I personally learned some new things and overall the meeting was useful

September 28, 2023

In this meeting, the team delved into the implementation details of various IPs, including GPIO, UART, QSPI, and others crucial for our project. I personally worked on QSPI and GPIO and routing it on the block diagram

October 3, 2023

We went to Ingenion itself and talked to them personally. We outlined a detailed plan for this migration, considering hardware compatibility and potential adjustments needed. The team discussed the importance of the transition and planned for testing procedures to validate the functionality on the new platform.

October 17, 2023

The objective was to create a "Hello World" design, a crucial step in ensuring the correct integration of the real-time operating system. The session began with a walkthrough of the FreeRTOS "Hello World" template, emphasizing key functions and configurations. Team members actively participated in coding exercises, implementing and testing the basic functionalities of FreeRTOS within our project context. Ryan Flinchum helped tremendously.

October 24, 2023

Today's meeting centered around the implementation of the 1 Pulse Per Second (1PPS) functionality within our project.

October 31, 2023

Started the debugging phase of the 1 Pulse Per Second (1PPS) implementation. The objective was to address any issues or anomalies identified during the initial coding of the 1PPS feature. I personally didn’t know how to do it so I observed Ryan, Jack and Hamilton.

November 7, 2023

Updated and refined our Software Design Document (SDD), Software Requirement Specification (SRS), and Test Plan, incorporating essential diagrams for clarity and completeness. I helped on the SDD and SRS.

November 21-23, 2023

Focused on the crucial phases of debugging and finalizing the FreeRTOS WebServer implementation. Also started/ finished the PowerPoint for our final presentation.

December 5, 2023

Final presentation went great.