

CECS 361

Project 4 – Self Checking Test Bench

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Description:

Self Checking Test Bench project was to implement the design from the project 3 to add three static objects, wall, ball and paddle. The heart of this project was to make sure that the design meets all the requirements using a self checking test bench for verification.

Documentation:

This project was a very simple lab. The only modules that were implemented were the pixel generator and the self checking verification module. Even though there were only two modules implemented, if the designer was not meticulous there could have been many room for mistakes. I did have some error when I was designing the modules. Pupose of this project was not only understanding and implementing the static objects on the screen but also understanding that verification of the modules are far more important than that of just creating modules.

One of the failure was that there was a initialization error. RGB signal was initialized as 1 bit signal instead of 3 bits. The screen only showed red or black due to it. But the error was caught using the self checking test bench. Self checking test bench is convienient, because the location of error cannot be spotted if the design gets bigger. However, when the self checking test bench is used, the designer knows what the error is exactly which then shortens debugging process.

Verification:

For verification, the requirement of the project was to use the self checking test bench. The self checking test bench checks every signal on the top module, vga sync and pixel generator. Test bench checks whether the tick was generated correctly after 4 periods of clock, h\_sync , v\_sync and video\_on was on at the right time, and whether the object was correctly getting the right rgb signal when it was supposed to get the signals. To ensure that therer were not any error messages displaying, “start” was displayed to check where the error will display when there are any errors. After running and debugging, the projects was ensured that it works same as the project requirements.

