

2-Player Pong

By Peter Tran, Rafael Baltazar, Cuauhtemoc Lona, Nathaniel Case
ECE 3300.2, Fall 2023

The project titled "2-Player Pong" aims to incorporate the fundamentals of Verilog using VGA (Video Graphics Array), a type of video output. This project was conducted to explore the capabilities of FPGAs, one of many fields in Computer Engineering where the Nexys Artix-A7 board was used. The objectives of this project were to learn and understand the basics of animating, utilization of VGA and the application of UART (universal asynchronous receiver / transmitter). Using sources from our studies, we gathered the necessary information to create a 2-Player Pong game with the idea of controlling each paddle using keyboard inputs through the capabilities of UART. The results were that we were successful in creating a Pong game with each paddle having hit detection and redirecting the ball to continue the game. The inclusion of scorekeeping using ASCII (American Standard Code for Information Interchange) characters allowed for a smoother experience with clear instructions shown on the display.

In conclusion, this project showcases our newly found knowledge on FPGAs being one of many subfields that can be learned in Computer/Electrical Engineering. The project was done by using the hardware description language known as Verilog to recreate a classic video game known as Pong. The developments we have made will allow for future additions to allow for new potential applications. This project overall serves as a resource for students in the Computer/Electrical Engineering field looking into the field of FPGAs.