

Jay Fernandez
Neel Goyal
William Blinn
Dave Coulthart
Jeff Lin

CS 4840 Project Proposal

XiNES

XiNES is a Nintendo Entertainment System simulator coded in pure VHDL and ported to the XSB-300E board, which utilizes a Xilinx Spartan FPGA. The NES itself consists of three main parts: a customized 6502 CPU, a Picture Processing Unit (PPU), and a memory hierarchy which includes the actual game ROM. Our goal is to implement all of these to get a single commercial game to run at full speed off of the board.

The main bulk of the project will be spent implementing the system's PPU. We intend to use all resources available to us, including online documentation, open source emulators, and even patented schematics (all of which will be cited and credited). The 6502 will be obtained by using a free, open-source VHDL implementation of the 6502, called free-6502. It is our goal to connect our PPU and this 6502 implementation in some way such that an NES game will run. Running multiple games will require much more effort as the NES uses different memory mappers for different games, thus adding to the complexity of the project. The game we choose to run is undecided at this time.

Our project will require a monitor which supports raster scan and NTSC, much like the old monitors from an Apple IIGS. We may decide to purchase one if one is not found easily. Another option would be rewriting the PPU to output VGA signals. Sound is also an option, but graphic implementation is the primary goal. Should we have time, we may decide to add sound, and even use one of the XSB-300E's input ports to connect a controller to.