

This project presents the design and implementation of a real-time Morse code training game on the DE0-CV FPGA board using Verilog. The system integrates secure user authentication, VGA-based text display, timed input handling, and letter-by-letter Morse code decoding. After logging in with a valid 4-digit ID and 6-digit password, users are shown a random 5-letter word and must input each letter using dot and dash buttons. The system decodes the Morse input, compares it against the target word, and provides real-time feedback through LEDs and VGA. A timer controls the 99-second game session, and the player's score increases upon correctly matching full words. The design includes modular finite state machines for authentication and gameplay, memory-mapped word storage, and cascaded timers using an LFSR-based core. Simulation and hardware testing confirmed full system functionality. This project demonstrates a practical application of FPGA design principles, including digital control, memory interfacing, and user-interactive hardware systems.