

# DUCKHUNTER

6.111 Final Project

Taylor Barton and Andrew Lisy

October 30, 2005

## Abstract

*Duck Hunt* is a classic first-person shooter game for the Nintendo Entertainment System, in which the player uses a special light gun to “shoot” images of either one or two ducks or clay pigeons, depending on the game mode. Our *Duckhunter* project will focus on the third mode of this game: clay shooting. In this mode, two clay pigeons are launched from the bottom of the screen into the distance, and the player is given three shots to hit them both before they are too far away.

In order to beat this game, we will build a servomechanism that will automatically track and shoot down the clay pigeons. The labkit’s FPGA will be programmed to “look” at the video output of the Nintendo System by receiving its video outputs, find the moving targets, and calculate the angle at which to aim the light gun. It will output the appropriate signals to two servomechanisms that will control up-down and left-right aiming, and fire the light gun. Once this basic function has been implemented, we will demonstrate the speed of the FPGA by playing our *Duckhunter* against either an overclocked Nintendo System or an emulator running the game at a high speed.