super three in one!
goalie-ninja-dodge

Jaiseung Bang, Vincent Liao, Arunagiri Venkatesan, David Yang
CSEE W4840 Spring 2011 Final Project
The Idea
Downscaling
Silhouette Generation
Downscaling
High Level Overview

Camera to ADV7181

640x480 NTSC Video via Composite

ADV7181 to Altera Cyclone II FPGA

I2C

YCbCr

VGA Monitor

VGA signals

Mode Buttons

Background Capture Button

7 Segment Displays

Altera DE2 Board
Architecture

Video Decoder
- YCbCr video from ADV7181

Downscaler
- YCbCr data and X/Y coordinates
- Downscaled data and X/Y coordinates

Background RAM
- From background capture button

Foreground RAM
- From mode buttons
- Downscaled data and X/Y coordinates

Silhouette Generator
- Coordinates of detected silhouette

Data Transfer
- Ball data

VGA Controller
- To VGA display
- To 7 seg displays

I2C Config
- From I2C to ADV7181

SRAM
- Avalon Bus

Avalon Bus

NIOS CPU
Design Decisions

• Block RAM

• 27MHz Clock

• Game Change
Issues

• RAM Issue

• Clock Issue
Goalie Mode

block
green
balls
Dodge Mode

avoid red balls
Ninja Mode

block green balls

avoid red balls
Lessons Learned

- TD_Reset
- 1 Dimensional Arrays
- 27Mhz VGA Clock
THANK YOU