Introduction: Pong in the real world

- SmartFusion FPGA powered
- DC motors on gearbelts to move paddles
- Solenoids used to “punch” ball
  - Triggered by laser interrupts
- LCD screen display
  - Score
  - Time remaining
- Wood table and base
  - Fun for the whole family

Controls: Nintendo 64 controller

- Bits send in sequence with 4 us period
- Send controller 000000011 to request data
- 32 bits sent back from controller (order seen right)

Implementation: Powered by ARM Cortex-M3

Design Structure

- CORTEX M3
- APB3 BUS
- FPGA
- N64 Controller
- Lasers
- Solenoids
- LCD Screen
- Motors

DC Motor Control

- Powered by 12 V power supply
- H-Bridge used to control direction
- GPIO pins set H-Bridge when joystick is pressed
- PWM used for variable control with joystick

Solenoid Control

- Powered by 12 V power supply
- Relay used to control power to solenoid
- GPIO pins set relay when laser triggers

Power Ups (If time applicable)

- Button sequence appears on screen
- First player to press sequence gets power up
  - Temporarily stop opponent’s motor
  - Remove opponents variable control
  - Gain points