EEL 4924 Senior Design

1/15/2015

Project Abstract

Title: Game-Man

Team Name: Super Engineering Bros.

Submitted by:

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**Project Abstract**

The goal of this project is to design and build a hand held gaming system. This system will have 12 input buttons, backlight TFT-LCD display with 16 bit color depth and touch screen, audio output, vibrational feedback, external memory interface (cartridge), and a rechargeable battery. The system will also be able to load a game from and external flash “cartridge”. A simple game will be created to demonstrate the functioning of the various inputs and outputs of the system. In order to accomplish this, an Arm cortex m4 based 180Mhz processor with LCD controller and an extensive amount of external RAM will be used. If time permits a RAM addressable LCD controller with built in double buffer will be implemented using a CPLD and RAM to optimize video output.

The expected outcome will be an open source hand held gaming system with 480X272 WQVGA resolution capable of running simple 2D games similar to that on the Game Boy Advanced or Super Nintendo.

**Introduction**

The Game-Man is applicable in the video game, entertainment and hobbyist domains. The purpose is to create a simple hand held game system that hobbyist can create and share their game designs on. Many people who grew up with simple 2D games are interested in creating games for themselves, this hardware will allow them to create their own games and play them on the go. A simple interface for getting input data, outputting audio and rendering their game will be provided to allow for easy game development. The Game-Man will be an open source gaming system that users can easily develop simple 2D games for, similar to those on the Game Boy and Game Boy Advanced.



Figure 1: Example of Target Capabilities

**Technical Objectives**

The objective of this project is to create a gaming platform powerful enough to run simple 16bit color 2D games on the go. This includes:

* 12 buttons for control
* Touch Screen
* Audio output for music and sound FX
* Rechargeable 3.7V lithium ion battery
* backlit TFT LCD display with 60hz refresh and brightness control
* 16bit color depth
* 480X272 WQVGA resolution
* Vibrational feedback from vibration motor, with varying intensities
* 180MHZ Arm Processor
* High Speed External SRAM
  + 2 256KB frame buffers
  + Cache memory for data copied from flash for faster processing
* Firmware for interfacing with inputs and rendering