Game Console Emulation on a Non-Native Architecture

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# Overview

The primary goal of this project is to emulate a game console of choice in a different environment than what it was designed for. We are considering Nintendo’s GameBoy as the system of choice. We believe the GameBoy to be the best choice due to its modest hardware requirements and the simplistic nature of its design. This allows us to focus more on the implementation details rather than conceptual details, which are rather complicated in more modern systems that introduce improved graphics support.

Furthermore, we intend to develop this emulator on customized hardware. <shit>

# Objective

The primary objective of the project is to develop a functional emulator for the Nintendo GameBoy. By the latter part of the semester, we hope to have a completed product that is able to run commercially available games.

# Student Involvement

The development of the emulator can be roughly divided into four areas: Cartridge, Graphics, Target Processor Emulation, and Internal Memory Management.

The Cartridge area can be broadly described as the functionality that allows the emulator to read and write to the game cartridges. This is done mostly when loading program data, but also involves matters such as paging, as the on-chip memory is considerably smaller than the GameBoy’s logical address space.

The Graphics division involves primarily interfacing with an external device that is capable of displaying graphics. This division is used heavily by the Target Processor Emulation division.

The Target Processor Emulation is the core of the emulator. This serves to interpret Gameboy instructions.

Finally, the Internal Memory Management area serves to provide an abstraction to the program to allow it access to external devices—most notably the keypad and the directional pad.

The Cartridge and Graphics sections will be developed by Deva, while the Processor Emulation and Memory Management sections will be developed by Matt.

# Methodology

Writing the shit.

# Schedule

Beginning of Semester – start the project

Middle of Semester – submit some midterm report crap

End of Semester – finish the project

# Learning Outcomes

# References