E-Week Engineering Showcase 2025
CPE496/498 Capstone Design Course

Charger Arcade Terminals

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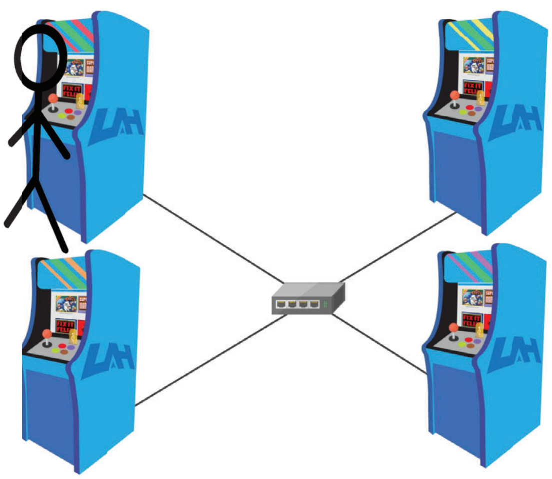
The Need

In some of the classes provided at UAH, games are developed as part of assignments. These games never go anywhere, mostly just being discarded upon course completion. The effort and creativity put in to these tasks is used only for a single grade.

The Proposed Solution

The UAH Charger Arcade Terminal project seeks to serve as a platform where these games can find new life and be enjoyed by many for years to come. These terminals will allow users to play either student-created games, in single-player or multiplayer with up to three other arcade terminals, using simple arcade-style controls.



Requirements

- Terminal runs student-made games in multiplayer and single-player fashions in an arcade machine utilizing arcade controls
- Terminals must run student made games in supported Windows or Linux environments
- Terminals must have a user interface which allows users to select and play a game
- The User Interface must allow users to select other terminals to connect for multiplayer games
- Users must be able to upload games to the Arcade Terminal via USB
- Terminal electronics must be housed in an arcade machine styled shell
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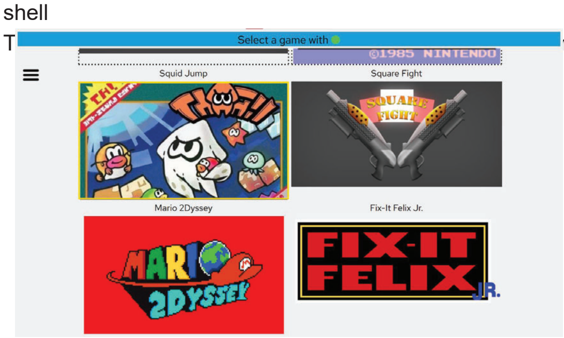


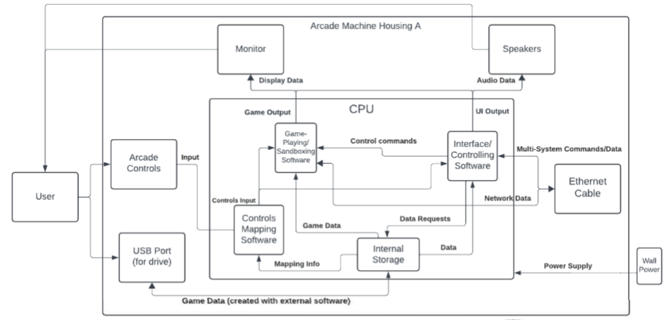
Acknowledgements

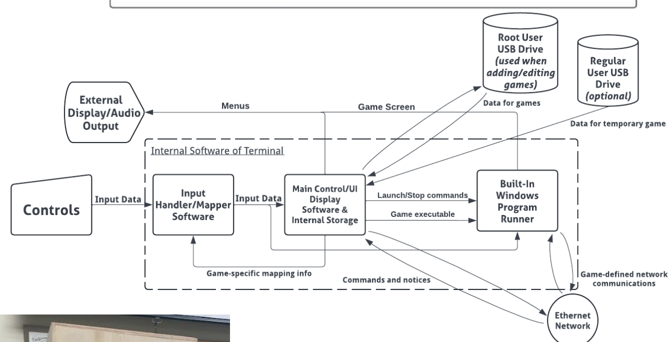
We thank Dr. Wells, Chris Hardy, and Cliff Bell and the UAH Computer Engineering Department for guidance and support with this project.

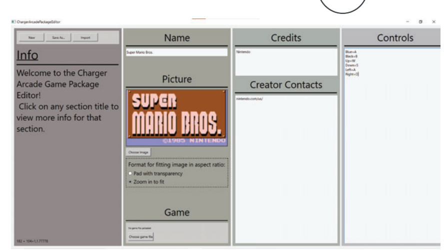
The System Design

The Terminals each function off of a main computer, recycled from the older computer labs at the UAH Engineering Building (which are planned to soon be discarded), and interface with their controls and peripherals to display the game/ui to the user.

The Terminals communicate game information and system commands/ data to one another from a central ethernet switch.


Arcade Machine Housing A
Monitor
Speakers
Display Data
Audio Data
CPU
Game Output
UI Output
Game-Playing/ Sandboxing Software
Control commands
Interface/ Controlling Software
Multi-System Commands/Data
Arcade Controls
Input
User
Ethernet Cable
Controls Input
Network Data
Controls Mapping Software
Game Data
Data Requests
USB Port (for drive)
Internal Storage
Data
Mapping Info
Power Supply
Wall Power
Game Data (created with external software)


Root User USB Drive (used when adding/editing games)
Regular User USB Drive (optional)
External Display/Audio Output
Menus
Game Screen
Data for games
Data for temporary game
Internal Software of Terminal
Controls
Input Data
Input Handler/Mapper Software
Input Data
Main Control/UI Display Software & Internal Storage
Launch/Stop commands
Game executable
Built-In Windows Program Runner
Game-specific mapping info
Commands and notices
Game-defined network communications
Ethernet Network



Results/Future Work

With the Charger Arcade Terminal, student-created games will have new life, providing a special place for students to play and share theirs or each others creations as a lasting memory, and their creations can invite attention from interested visitors.

The future work will include the construction and implementation of multiple terminals on campus, updating the software with new features that were unable to be done previously, and uploading of games to the systems.

This project effectively acts as a layer over the environment it was created in. The Charger Arcade Terminal's goal is independent of the hardware which the Terminals operate off. As such, any future development can expand the system to work in as many environments as possible.