



Laser Arcade Machine

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Problem Statement

Laser arcades are entertaining to a wide range of people and demographics. Currently if someone wishes to shoot lasers at targets they need to go to a specific location that hosts that sort of entertainment. We intend to develop a mock system that will demonstrate the possibilities of a portable laser arcade machine.

Ideally the hosts of this portable laser arcade would be able to set targets around a room, turn on the system, and pass out laser blasters. The users would utilize an app on a tablet that provides a UI for the gamemode, stats, and status of the current game.





Constraints

Budget

- \$1000

Time

- 10 weeks of design and planning
- 15 weeks of development
- Request and receive specific parts for the project in a timely manner

Scope

- Mock up of the system
 - Future development could turn this into a marketable product
 - The entire system including the laser blaster, targets, and controller should be extremely portable
 - Plan on having a case to store the system for easy transport

Risk

- Two sections of the team will be working on substantially different parts of the project. Connecting the two main parts is the highest risk point.



Requirements - Software

- The backend should be hosted on a server of some type
 - Capability to connect to the front end app
 - Capability to connect to the game system itself
- The database should hold key player stats and info
 - Capability to connect to the backend in order transfer the player's data to the front end to display the players stats to them
 - Capability to automatically update and refresh player's stats
 - Secure and reliable database that we can only access
- A multi-platform frontend app development framework
 - Capability to compile to different operating systems
 - Work on android tablets that will go with the system

Requirements - Shooter Hardware

1. Powering
 - a. Lithium Ion Batteries
 - i. Rechargable
 - ii. Needs protection Circuitry
 - b. Replaceable Batteries (AA or AAA Batteries)
 - i. Frequently needs to be replaced
2. Laser shooter
 - a. Visible light (Laser)
 - i. Can damage eyes
 - ii. Can see where you hit
 - b. IR
 - i. Can't see where you hit
3. Visuals
 - a. LEDs to see shots/ammo left
 - b. Different color shooter to denote player
 - c. Spring loaded chamber to reload



Requirements - Target Hardware



1. Targets
 - a. 2-4 targets to start
 - i. To be placed 10-20 feet away from shooter
 - b. Varying in size
 - i. 4-8 inches in diameter
 - ii. Absorb light rays
 1. Similar to laser tag
 - c. Visuals
 - i. Made of LED's to denote different things
 1. When to shoot
 2. Who got the points for the target
 - d. Identify each shooter
 - i. PWM
 1. This is how TV Remotes work
 - ii. Frequency
 1. Read the wavelength

Engineering Standards

(ANSI/ANS 10.3-1995 Standard for Documentation of Computer Software);(ISO/IEC/IEEE 26514)

IEEE 2030.2.1-2019 - IEEE Guide for Design, Operation, and Maintenance of Battery Energy Storage Systems, both Stationary and Mobile, and Applications Integrated with Electric Power Systems

Intended Users and Uses

- Mock project to demonstrate capability of this sort of system
- Intended use is to determine interest and marketability
- Find potential investors or buyers



Rules