

# Project Proposal: Battleship

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## Overview/Goal/Purpose

The goal of this project is to recreate the board game battleship on the stm32 board. We got our insight from the GO game in the previous years' projects for using 8x8 dot LED displays for the 'board' of the game and using Wii nunchuks to control the pieces.

## Peripherals

- 2 MAX7219 8x8 Dot Matrix Red LED Display
- 2 Wii Nunchuk Controller
- Termite terminal

## Serial interface protocols

- I2C (Wii Nunchuk)
- SPI (8x8 Dot Matrix Red LED Display)
- UART (Termite terminal)

## Block diagram

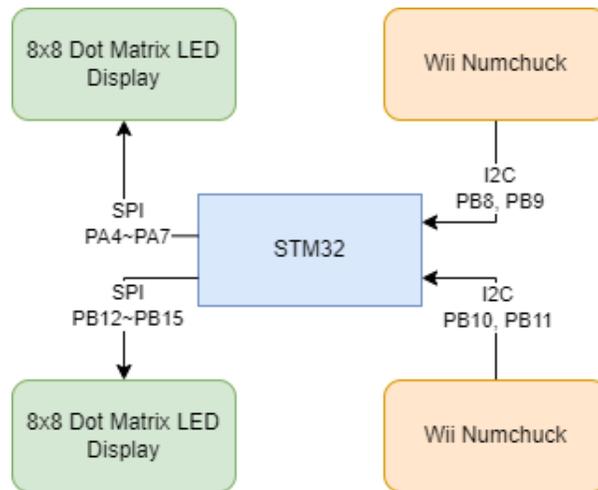


Figure 1: Block diagram

## Responsibility list

Eric: Display, website  
Anna: Nunchuk, termite  
Both: game logic

## Software structure

Files needed: nunchuk.c, display.c, spi.c, i2c.c, main.c, sysTick.c

## Program flow

1. Initialize I2C for Wii nunchuk
2. Initialize SPI for 8x8 Dot Matrix LED displays
3. Initialize UART for Termite terminal
4. Set up PWM to be used to toggle the player's cursor with systick interrupt
5. Randomly initialize ship locations
6. Do game logic (recalculate displays)
7. When reach win condition, show winning prompts

## State diagram

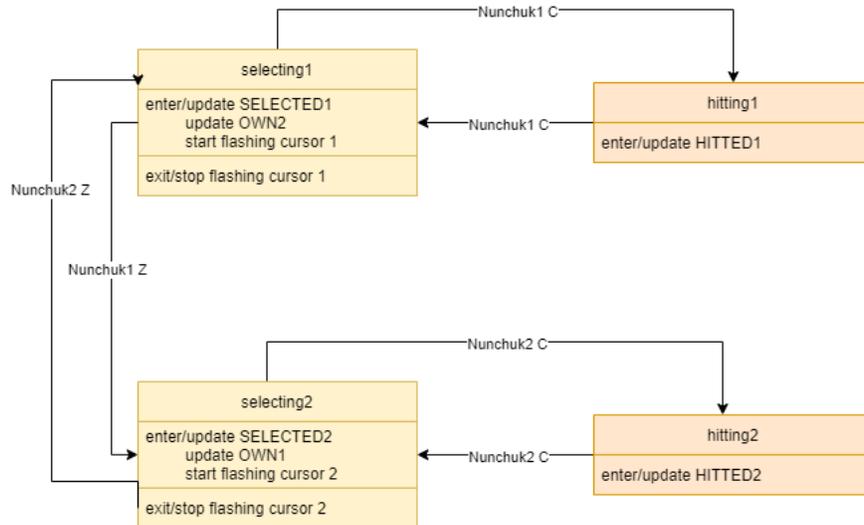


Figure 2: State diagram

## Game state description

State	player1 display	player2 display
selecting1	SELECTED1	OWN2
hitting1	HITTED1	OWN2
selecting2	OWN1	SELECTED2
hitting2	OWN1	HITTED2

## Display description

Each player will have 3 kinds of display arrangements available which will be stored in six 2D int arrays:

1. Shows your current ships that hasn't been taken down (OWN)
2. Shows the enemy ship locations that have been targeted before (SELECTED)
3. Shows the enemy ship locations that were actually hit before (HITTED)

## Game controls

Wii nunchuk joystick: move the player's selection position when in the SELECTING state

Wii nunchuk C: toggle between HITTED and SELECTED display when player is selecting

Wii nunchuk Z: select the position to hit

## Website

[https://yi-hsien.github.io/153b\\_anna\\_eric/](https://yi-hsien.github.io/153b_anna_eric/)

## Stretch goals

- player selecting the location of ships
- using LCD display instead of termite terminal for showing game prompts
- programming a winning screen on 8x8 matrix