

Team Member Names:

- Josue Menjivar-Mendez

Project Title:

- LED Matrix “Arcade”

Project Abstract:

- I will try implementing a game, or multiple games/features, using an 8x8 RGB LED matrix. The goal is to interact with an LED matrix using the STM32 Nucleo 64 development board through the use of serial interface protocols, peripherals, and interrupts.
- I want to implement this project using some sort of controller sending information to the Nucleo board which will affect how the interaction of the LED matrix. This will be done either with a Wii nunchuck controller or through the USB Host Shield which will allow the use of a PS4 controller. Object detection will be implemented to simulate a user who is nearby ready to use the project. A display will be provided to display the state/mode the project is in. LED matrix will be used to simulate arcade-like, or simple, games.

Protocols:

- I2C Protocol for OLED Display Module
- To control the game a Wii Nunchuck controller or an alternative (USB Host Shield) controller where both will be available through the use of the SPI Protocol
- I will be using UART protocol to give users an option to initiate a mode for the game

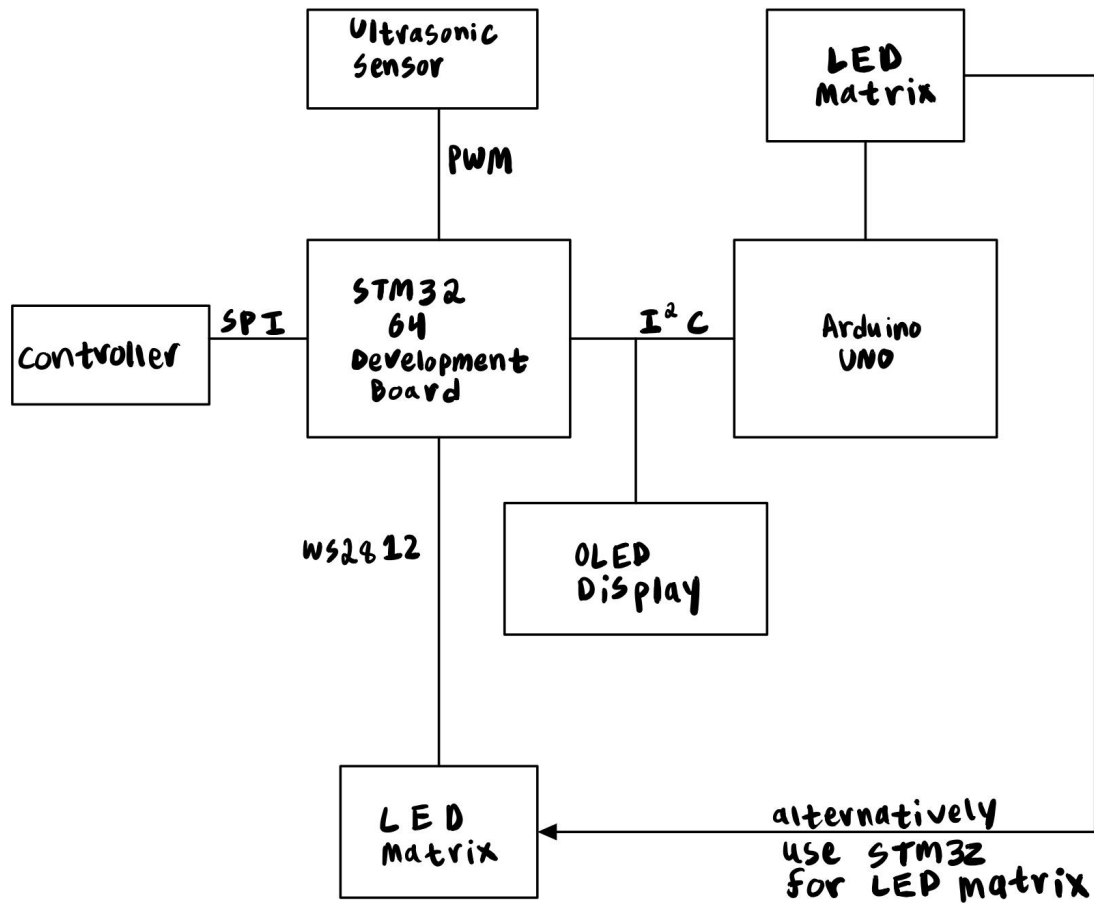
Peripherals:

- OLED Display Module
- USB Host Shield
- LED matrix
- Controller (Wii nunchuck or PS4 controller)
- Ultrasonic Sensor

Website:

https://sites.google.com/d/1sSEst9MG1-FSVFBXQ1JcoomE00_Q8iDe/p/1XyzAtPz0pstPN5XQH1PN5_kZ-bK1_KVX/edit

Block Diagram:



Teammate Responsibilities:

- Josue Menjivar-Mendez will be responsible for the entire project.

Software Architecture:

- I will be using systick and timer interrupts as they are needed for some of the protocols and for real-time delay.
- If an Arduino connection is needed, I will be using Arduino libraries to establish interaction with the matrix, unless STM32 Nucleo board interaction is a bit complex.
- Register level programming for initialization of pins, serial interface protocols, and implementation of functions.
 - I will be using register-level programming to establish the SPI, UART, and I2C protocols. The labs would be the foundation for this.
- Some imported libraries for PS4 controller (USB Host Shield) or LED matrix (Arduino), if necessary.