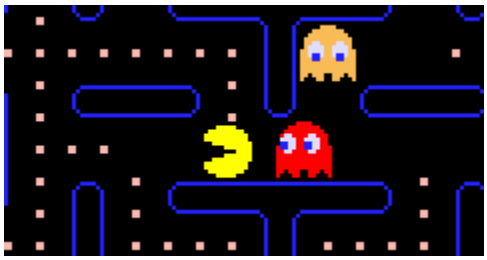
CS/EE 120B - avarg116

Custom Laboratory Project: Pac-Man Clone

Project Demo

Introduction



Pac-Man is a classic arcade game that challenges players to navigate a maze, collecting all the pellets on screen while evading ghosts. The game begins with a startup screen displaying the title, high score, and player score. The first level starts and the player is given control over Pac-Man through a joystick. After winning or losing, players return to the startup screen where the score will either increment or reset to 0. The game can be reset anytime by pressing the joystick button.

Complexities

1. **Ghost behavior:** the ghost possesses its own dynamic state that is influenced by Pac-Man's X and Y positions. The ghost is programmed to avoid overwriting pellet sprites and only moves when the game is actively being played.
2. **EEPROM:** the EEPROM saves high score data and displays it on the LCD. During the win or lose state, the reset game function is called, comparing the current and high scores.
3. **TFT screen:** a potential future enhancement for the graphics of Pac-Man. Despite successful wiring and test code execution, it is limited to library usage.

User Guide

Interface: players interact with Pac-Man via a LCD screen. The character is controlled in 4 directions using a joystick.

Game elements:

- Hero - play as the legendary Pac-Man.
- Enemy - beware of mischievous ghosts.
- Points - collect pellets to score big.
- Info - stay informed with relevant on-screen text.

Startup screen: presents current and high scores.
Restart game: restart game by pressing the joystick button.
Audio: there are no sound mechanisms incorporated in the game.

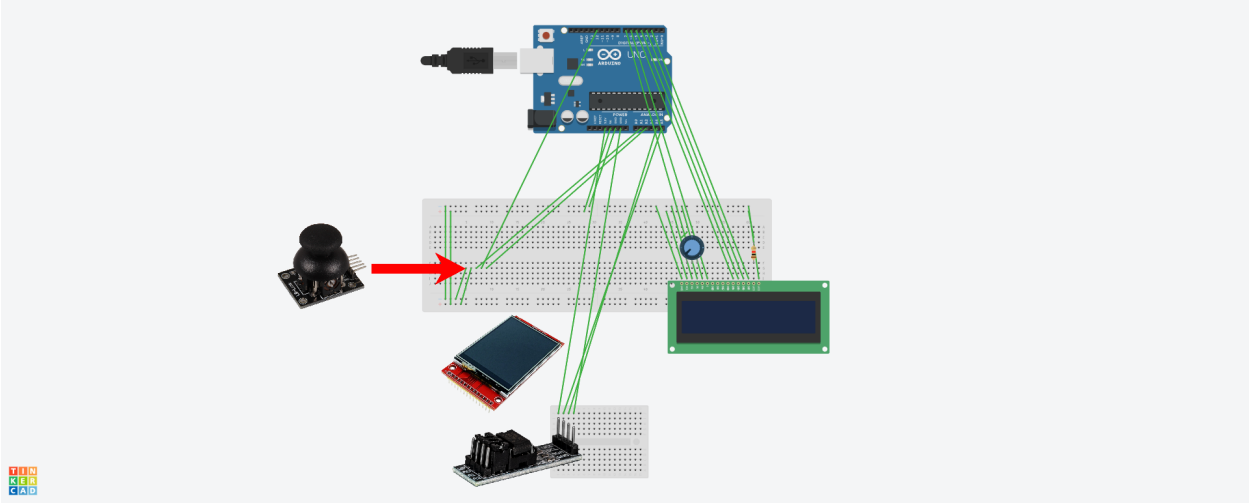
Hardware Components

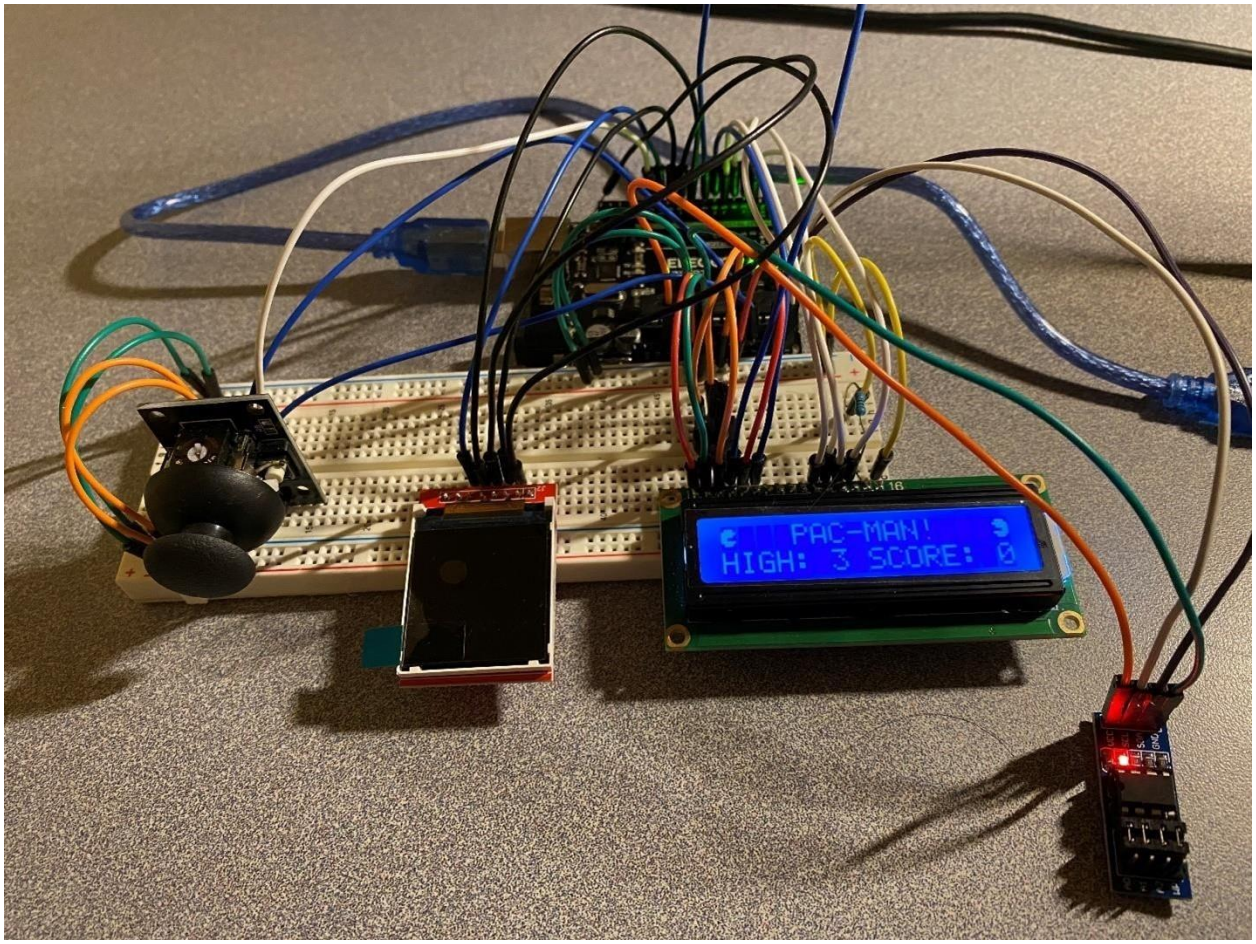
1. LCD 1602 Module
2. Joystick
3. EEPROM
4. HiLetgo 1.44” Colorful SPI TFT LCD

Software Libraries

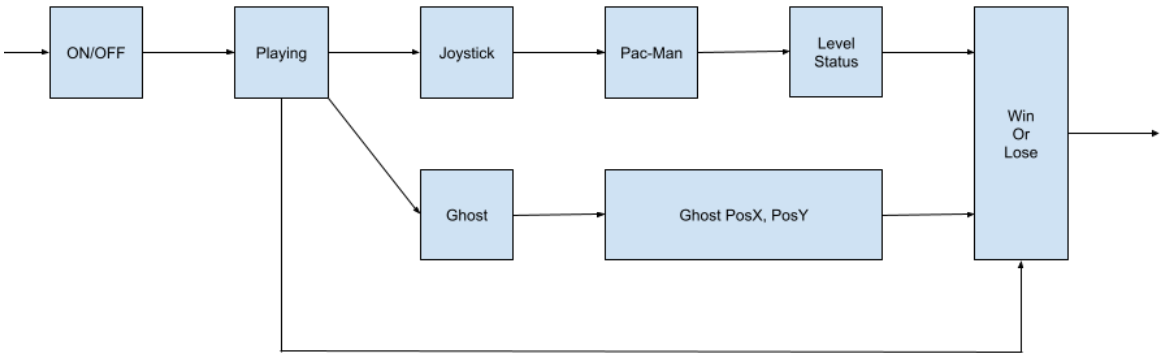
1. LiquidCrystal: displays graphics and text on the 16x2 LCD, primarily handling game sprites.
2. Wire: enables EEPROM data read and write functions, incorporating commands to write and begin and end transmission to the child device.

Wiring Diagram





Task Diagram



SynchSM Diagrams