Disability Friendly Pictionary

CSE 321 Project 3

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Table of Contents

Introduction

This document is the culmination of a four-week design process. This document outlines system specifications, internal software features, the design process, user setup, and a testing plan for a 2 to 4-player disability friendly Pictionary game. The project idea came from my love of painting and drawing which individuals with very shaky hands or missing fingers can struggle greatly at. The idea of the project was to map hand motion to display on a screen allowing users to draw without having to pick up a pen or pencil. While the motion mapping is the main feature of the system, it also comes with a display to keep score and time rounds as well as a keypad to make guesses and change the drawing functionality.

Specifications

- Keypad inputs are software debounced
- Ports in use:
    - E – keypad outputs
    - F – keypad inputs
    - C – IR sensor outputs
    - A – Dot Matrix inputs
    - D – Dot Matrix input
- All components can hand 3.3V to 5V power supplies
- LCD uses SCL and SDA pins
- Dot Matrix uses miso, mosi, and cs pins
- Dot Matrix is controlled via whole LED rows
- Only the first 2 rows of the keypad are in use

Features

- A single game has 3 rounds
- The prep a drawing stage is 5 seconds
- The drawing/guessing stage is 25 seconds
- Continuously updating LED Dot Matrix to display the drawers' picture
- Blinking cursor
- Score, current round, and time left display
- Runs indefinitely
- Thread safe
- Synchronized

- Keypad constraints:
  - ‘A’ – invert pen
  - ‘B’ – invert eraser
  - ‘1’ – player 1 is making a guess
  - ‘2’ – player 2 is making a guess
  - ‘3’ – player 3 is making a guess
  - ‘4’ – game start
  - ‘5’ – incorrect guess
  - ‘6’ – correct guess

Required Internal Feature Integration

Watchdog –

Synchronization –

Bitwise driver control –

Critical section protection –

Threading –

Interrupts –

Design Process Recap

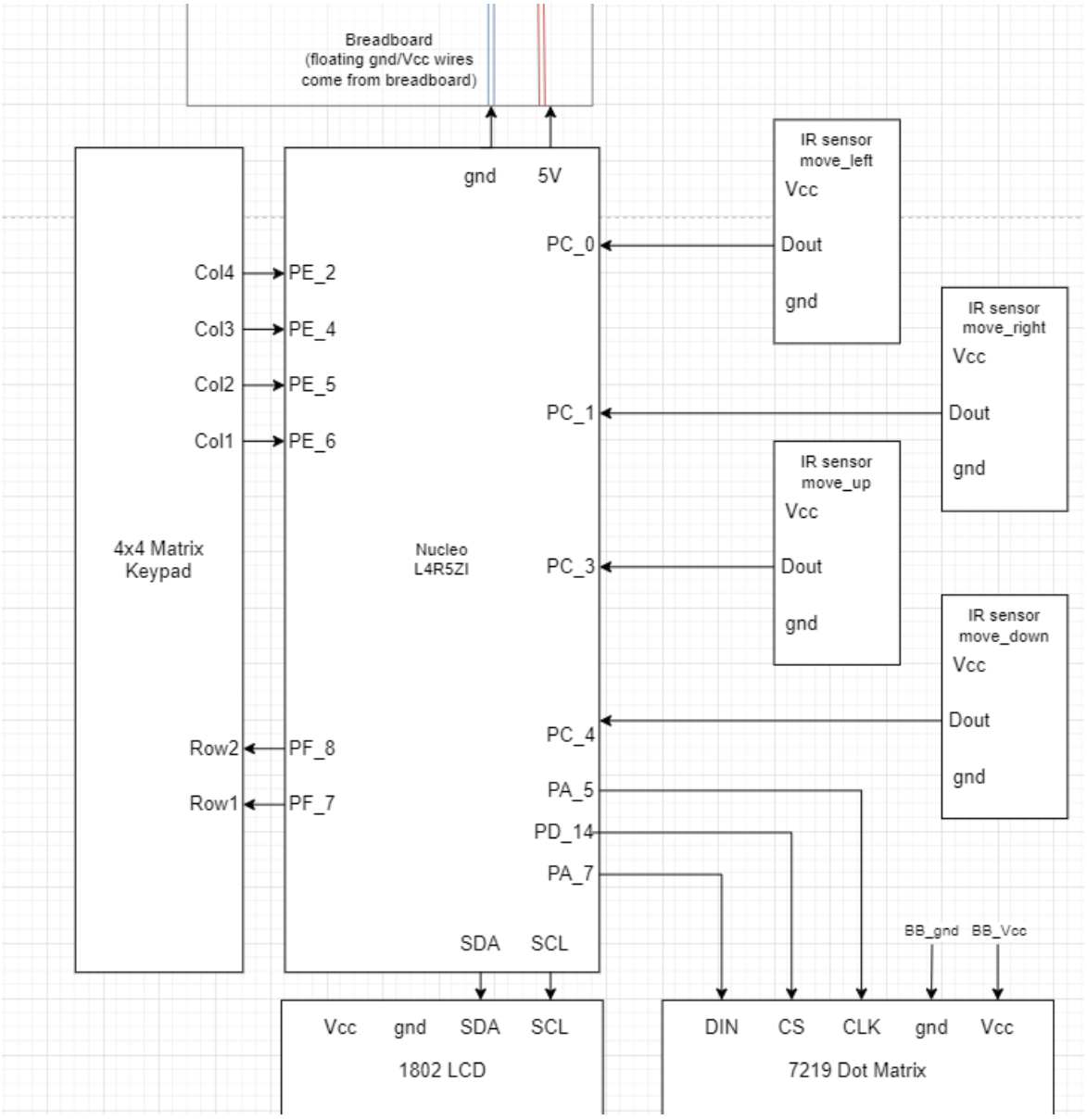
Block Diagram

FSM Diagram

BOM

User Instructions

Schematic



Building the system

Using the system

Test Plan

Results

BOM Index