Whack-a-mole

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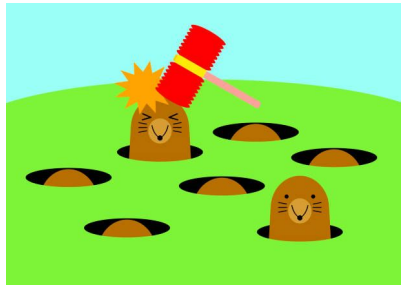
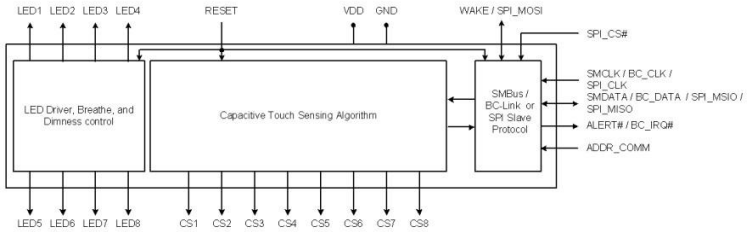
Introduction

We built an interactive Whack-a-Mole game using outputs all controlled by an STM32 Nucleo microcontroller. This project combines responsive gameplay with embedded hardware design to showcase real-time sensor integration.



Touch Details

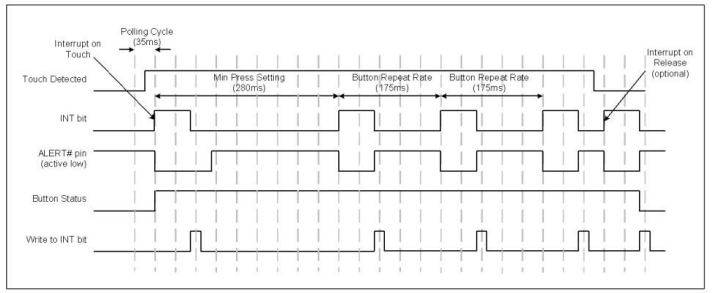
The most unique part is the capacitive input, read via I2C from the CAP1188. A finger increases the capacitance when near the inductive copper sheet, and the chip detects this.



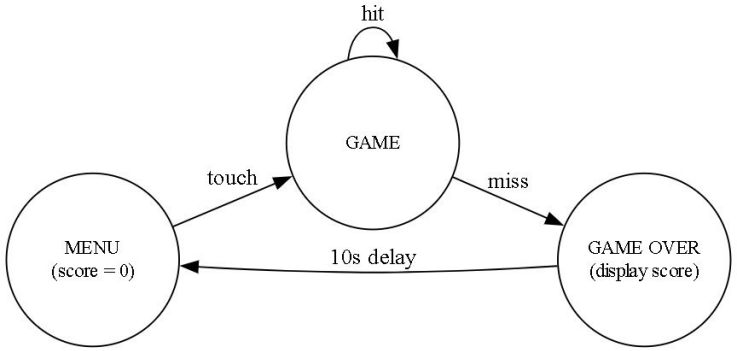
Software

We implemented a scoring system that increments on correct hits and resets on misses, using a polling-based main loop and interrupt-based touch detection.

FIGURE 5-2: Sensor Interrupt Behavior - Repeat Rate Enabled

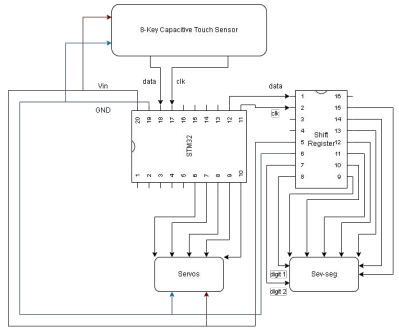


The code includes libraries for I2C communication, GPIO control, display logic, and servo control, with state dependent mole behavior encoded in a simple game loop.



Hardware

All on one board, our system uses a capacitive touch sensor as a player input, five servo motors to animate the moles, and a shift register 7-segment display for the score output.



Housing design

All moles, motors, and computation happens within one arcade block, intricately designed to steadily hold all mechanics.