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ExploSnake Product Design Specifications

Executive Summary

The ExploSnake is an interactive handheld gaming device. The ExploSnake features the new hit game Snake on a beautiful OLED screen. Control your slithering friend using the integrated gaming controls to capture as much food as possible. Once you either hit yourself, or the edge of the screen, the capacitor integrated into the device will explode! Once the capacitor has exploded, the device will be unplayable until the user replaces the through-hole capacitor on the back of the unit (capacitors sold separately). Challenge yourself and your patience!

Market Analysis

The intended customers of this device are fellow electrical engineering students. The main feature of this device is destruction, something many student engineers enjoy, which also incorporates some basic electrical components. The game is simple and requires little concentration, something many student engineers also enjoy.

Currently, there is no other product like ours on the market. Yes, some may contain the game snake, but no others have an intentionally blown capacitor as their main draw. Our product brings excitement to an already thrilling game!

Our product is slated for a price of $24.99. This price point ensures we remain under the $25 mark, while still allowing room for considerable profit. This is also a price point that is reasonably affordable to other students.

Requirements

The device must:

- Display a game of Snake
- Give the user control of the game
- Audibly alert the user when their snake dies
- Be resettable by anyone who can follow written directions, and in under 10 seconds by an experienced user.

The device must not:

- Allow the user to start a game when the device is not ready
- Pose any danger to the user or bystanders beyond the typical dangers of using a handheld gaming device when operated according to standard operating procedures
- Require the user or bystanders to use any safety gear not integrated into the device

The device may

- Require an external power supply
- Require the user to complete a reset procedure between games

The device should

- Require only readily available accessories
- Instruct the user on all aspects of the the device such that no separate manuals are required.
- Provide manuals covering anything not included in the built-in instructions
- Provide technically inclined users with sufficient information to play other games on the device
- Be easy to hold and play

System Architecture

The design is an Arduino Pro Micro receiving user input from four buttons (left, right, up and down), displaying the game on an OLED screen and enabling a MOSFET that provides 20V to a capacitor to cause a controlled explosion if the game is lost.

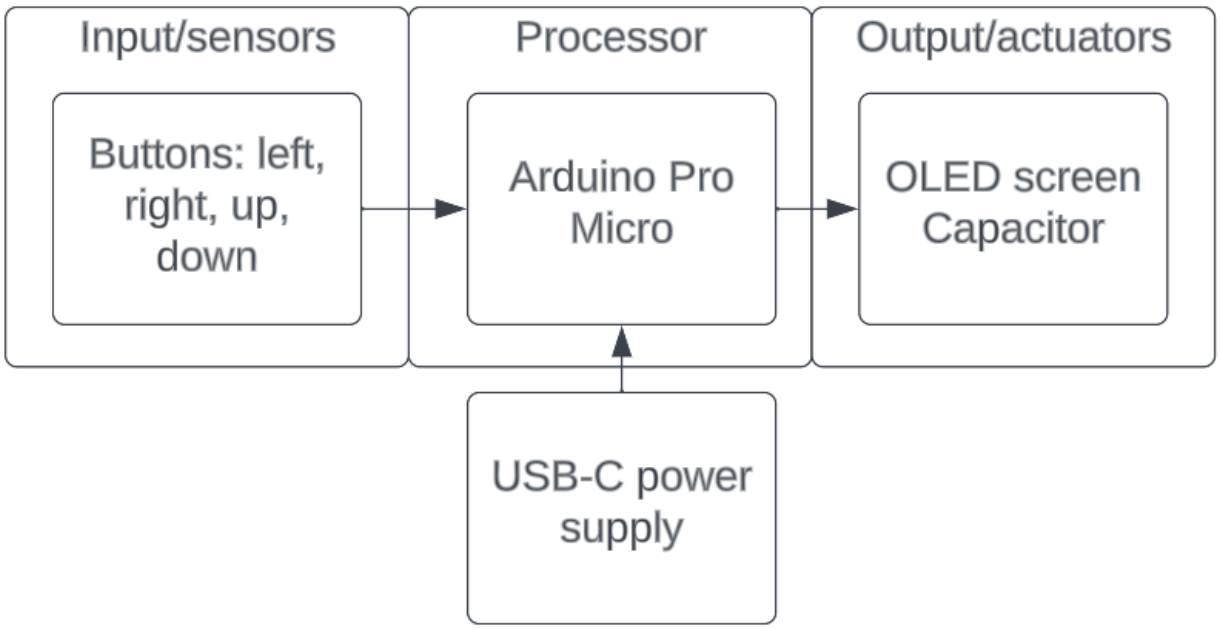

Figure 1: Level 0 block diagram of the design.

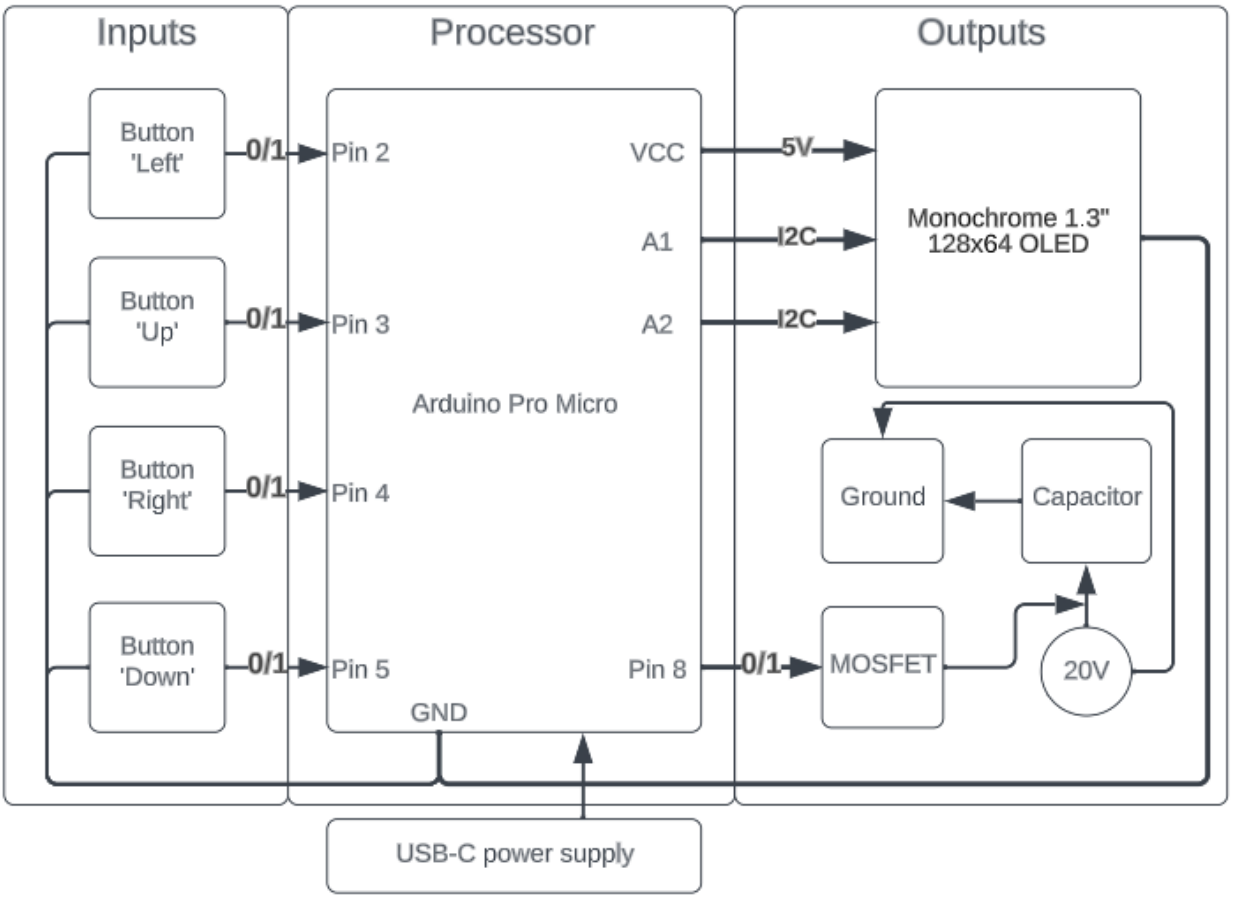

Figure 2: Level 1 block diagram of the design.

Design Specification

- Our processor is the ATmega32u4 from the Ardiuno Pro Micro.
- Our sensors consist of:
    - 4 buttons for controlling the game
    - Some method of sensing if a fresh capacitor is installed
- Our actuator consist of:
    - The 128x64 Pixel OLED Screen to display the game.
    - The A small capacitor for the explosion.
- The device will be powered from from an USBC-PD2 Wall adapter.
- The device will be handheld-sized gaming figure with a screen in the middle and buttons on its left and right sides. Along with an extended part for the explosives.
    - Estimated size of the product is about 9x6x3 cm.
    - Estimated size of the extended explosive part (capacitor) is about 2x2x2cm.