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**What will it do?**

The user will be immersed in a fast-paced multi-level shooting game that requires them to go beyond their comfort zone in making quick and effective decisions, which can lead to an improvement in their reflex speed and reaction time in the long run. The game will be displayed on the OLED and the user will control a virtual “player,” which will be on the left side of the screen. The player’s movement will be limited to an imaginary vertical axis. Horizontal blocks, the “targets”, will be generated on the right side of the screen and move towards the player. The user must control the player such that it fires “bullets” accurately towards the targets, preventing them from reaching the player (the game will be over if they do). If the user makes it to the end of a round by killing a specific number of targets, they will be able to unlock new “guns” with more destructive abilities. On the flip side, the “targets’” speed will increase proportionately for each round completed. If the user makes it to round 10, they win the game!

**Software Components**

OLED user interface

Multi-page inventory system

Accelerometer data collection

Bullet collision registration system

**Hardware Components**

OLED display: The game will be displayed on the OLED.

Accelerometer: Registers shaking, which signals that the user wants to fire a bullet

Pushbuttons: Two pushbuttons responsible for moving the player up and down and for navigating through the gun inventory

LED: Lights up when player fires for added effects

Slide Switches: Allows the player to access gun inventory

**Potential Challenges**

Bullet collision registration may be a challenge, especially for weapons with the ability to penetrate through multiple targets. By collision registration, we mean detecting when a bullet hits a target. The difficulty lies in predicting that a bullet and a target will hit *before* they hit so that we can create an effect when they actually meet.

Keeping track of the user’s unlocked weapons and displaying them through an inventory system might be a challenge.  The small size of the OLED display requires that the inventory system be multi-paged, which the user should be able to browse through freely.

Motion is only defined in the y and z axis. The board starts off with the screen pointing to the ceiling. As you tilt the board away from you by pi/2, y starts at 0 and decreases to -10; simultaneously, z starts at 10 and decreases to 0. (think of y as the height and z as the projection onto z) As the board is tilted by pi/2 again, such that it ends up facing down, y starts at -10 and increases back to 0, while z continues to decrease until it reaches -10.

-tilt until y value decreases by 6 (e.g. 6 to 0)

-record y and z

-if the difference between y2 and y (during edge cases) is 6 AND z changes signs.