

# **Project Proposal: Tanks**

## Embedded Systems

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### **Tanks: Tank Game Clone**

#### **Overview**

Our team intends to build a tank maze game based on the original Tank arcade game developed in 1974 by a subsidiary of Atari, where two players drive tanks around in a maze viewed from above, while attempting to shoot the opposing player's tank.

#### **Design Outline**

1. Use VGA output, implemented in FPGA hardware (SystemVerilog) to display the game, including the maze, tanks, and "shot". The users will control the tanks through a USB device, such as a keyboard or joystick. Note: we will need two separate input devices, one for each player.
2. Use sprite graphics to model the tanks and environment.
3. Create drivers to communicate with and send graphical commands to hardware.
4. Design tank movement logic and shooting mechanics in software in C to manipulate framebuffer, handle the game logic, and update the state of the game on the screen.

#### **Goals**

We would like to start with the basic mechanism of the game, where tanks cannot move through the walls of the maze and can only shoot in a straight line. Tanks move in either an up, down, left, or right direction and start in opposite corners of the maze at the beginning of the game. The winner will be based on who lands a hit first. Additional complexity we could add in if the basics are covered well in time would be landmines (obstacles in the maze that players must avoid), different power-ups that alter the shot of the tank, more realistic renderings of the

tanks/shot objects, or more players. A stretch goal could be to make the environment destructible, allowing the players to fire through walls and add some sort of random terrain generation, making each gaming experience with a fresh, playable map.