6.111 Project Abstract

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This document contains a project abstract for a tilting maze game implemented using a 6.111 Virtex II labkit and a prototype accelerometer-driven user interface device.

The game will consist of a ball on a tilting maze board. The board should have a configuration of obstacles such as walls and trap holes, along with a target hole. The user will control the ball's movement by controlling the tilt of the maze board. The objective of the game is to navigate the ball to the target hole without falling through any trap holes.

The labkit will render the maze board, obstacles and ball. The labkit will track the physical state of the game, which consists of the board's tilt, the ball's velocity and the ball's position. The labkit will update the game's state based on input from a three dimensional physics engine and a user interface device.

The user interface device will control how the user tilts the board. The device will consist of a two-axes accelerometer, potentially implanted in a wearable glove. Based on how the user orients his or her hand, the maze board shown on the screen should mimic the tilt of the user's hand.

Potential issues include handling measurement error from the accelerometers in the UI device, interfacing the UI device to the labkit, and the complicated rendering and shading of 3D objects on a 2D screen. Possible extensions to this game include adding multiple levels to the maze board, introducing complicated obstacles such as autonomously moving enemies, and requiring multiple balls to be guided to the target hole.