The Ultimate Ball Balancer

PROJECT PROPOSAL

Embedded System Design
CSEE 4840

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Academic supervisor: Professor Stephen Edwards

Earvin Caceres (ec2946)
Annjana Ramesh (ar3303)
Garvit Singh (gs2731)
Gautham Vunnam (gv2226)

1. **Introduction**

In this project we plan to implement an interactive game where the user has to balance a ball on a moving platform. The game principle is similar to the "Ball balance" game in Mario party. Here's a YouTube video for reference: http://www.youtube.com/watch?v=yFROUwmjWKE

2. **Design**

We intend to implement the project using Altera CycloneV SoCkit board, Wii controller, VGA display and speaker. The nunchuk controller contains an accelerometer which tracks the orientation of the platform; which in turn causes the ball to roll faster/slower depending on the position. Implementation will be done in SystemVerilog and C. We plan to build our custom VGA driver on hardware. We may use raycasting algorithm for adding 3D effects.

3. **Milestone**

i. **Milestone 1**
- We will implement the nunchuk controller as a peripheral device on the SoCkit board.
- We will use OpenGL/C graphic libraries for rendering 3D graphics and will come up with a prototype of the actual game. It will have a moving platform and a ball over it.

ii. **Milestone 2**
- We will improve the prototype.
- We will incorporate the audio output, will encode the sound for different game events like taking a point, falling off the platform etc.

iii. **Milestone 3**
- We will finalize the game and will try to make it a networked multi-player game if time permits.
- We will work on algorithms to compute the scores.
- We will further work on the graphics to convert it into a potential market product.