



**Bilkent University**

**Computer Engineering Department**

**CS223**

**Digital Design**

**TITLE: TWO PLAYER PONG GAME**  
using Basys3 and Betiboard

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**Section 06**

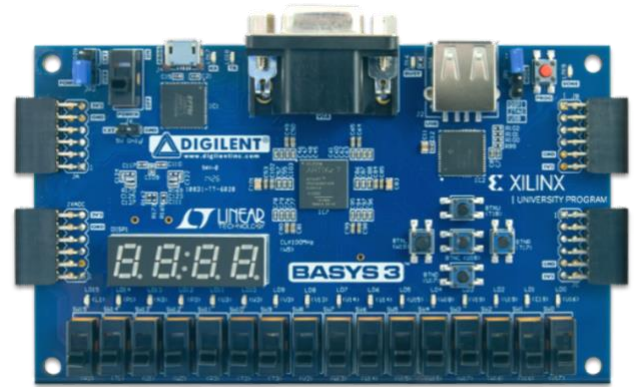
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## **Abstract**

*The idea we have about this project is to create a virtual table tennis game. Since the game will be shown on 8x8 Led Matrix it will move similar to Pong Game. This project proposal will demonstrate how we are going to build a pong game which will be played by two players. The main idea of this game is to avoid the ball passing beyond the paddle. The game will have two paddle, one for each player which will be controlled by the buttons in the Basys3 and BetiBoard. The players will be able to move the paddle from left side to the right side. The game need the ball which will be moving across the 8x8 Led Matrix and will change direction when he hits the side of the matrix or the paddles. We are going to make it as good as possible and if we finish this part before the deadline we will spend some time thinking about adding something extra on our project.*

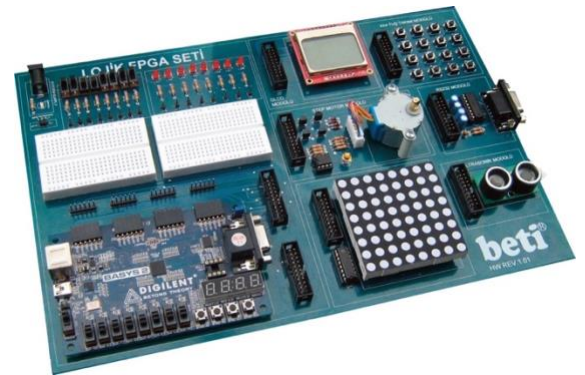
## Introduction

The game consists of the 8x8 Led Matrix and Buttons which are found on the BetiBoard. Basys3 Buttons will be used for the second player as we need two paddles. The logic will be controlled by Basys3 which is going to save the bit-stream code using System Verilog and update the 8x8 Led Matrix.



## Additional

- The game speed increases by time.
- After each game the score is shown on the 8x8 Led Matrix for a period of time.



## Inputs:

### BetiBoard's Buttons

BetiBoard offers 16 buttons but it will be uncomfortable for players to use both BetiBoard's buttons. So BetiBoard's Buttons will be used by one of our player to move the paddle. The other buttons will be used for extra activities like resetting the game.

### Basys3 Buttons

The other player will use buttons from the Basys3 for moving the paddle in the right position.

## **Outputs:**

### **BetiBoard's 8x8 Led Matrix**

The BetiBoard's 8x8 Led Matrix will be used to show the game. The ball will be represented as a single led and two paddles in the top and in the bottom of the 8x8 Led Matrix.



## **Conclusion**

### **Inputs:**

BetiBoard's Buttons  
Basys3 Buttons

### **Outputs:**

8x8 Led Matrix

### **Hardware to be used:**

Basys3 FPGA  
BetiBoard's 8x8 Led Matrix, BetiBoard's Buttons.