

# **THE PATHWAY**

## **Introduction**

“THE PATHWAY” is a computer graphics-based game designed to blend innovative gameplay with visually appealing graphics. The project aims to showcase advanced graphical techniques, immersive design, and creative problem-solving to enhance user experience. This report details the development, features, significance, and challenges associated with the project.

## **Overview of the Project**

“THE PATHWAY” is a 2D hybrid game where the players manipulate the movement of the plane to overcome obstacles. The game emphasizes precision, strategy, incorporating real-time rendering and physics-based interactions to create an engaging experience.

## **Key Features**

- Interactive Gameplay: Static and dynamic obstacles involving polygon & circle manipulation.
- Real-Time Graphics: Smooth rendering of animations and transitions.
- Physics Integration: Realistic collision detection and object behavior.
- Multilevel Design: Progressively challenging levels with unique themes.

## **Motivation of the Project**

The motivation behind “THE PATHWAY” stems from the desire to develop the popular mobile game named- ‘The Line Zen’. The project aimed to utilize basic computer graphics techniques to create a game that mimics the actual one.

## **Significance of the Project**

“THE PATHWAY” demonstrates the practical application of computer graphics principles, including rendering, physics simulation, and user interface design. To incorporate all these, the developers had to learn a lot of the physics implementation and intermediate level coding concepts.

## **Target Audience**

The primary target audience includes:

- Educational Institutions: Utilizing the game as a tool to teach problem-solving and physics.
- Developers and Designers: Looking for inspiration in computer graphics.

## **Literature Review**

Before attempting to build the game, the developers played similar themed games to learn about the basics and generate ideas for level designing. The projects also forced the developers to learn the basics of collision detection using SAT & and collision physics.

## **Tools and Features**

- Game Engine: cpp and Glut
- Graphics Tools: GLUT.
- Programming Languages: C++ .
- Physics Engines: SAT theorem.

## **Knowledge Applied Field**

- Physics Simulation: Realistic motion and collision detection.
- Human-Computer Interaction: Designing intuitive interfaces.
- Game Development: Integrating artistic and technical aspects seamlessly.

## **Career Opportunities**

The project opens pathways in:

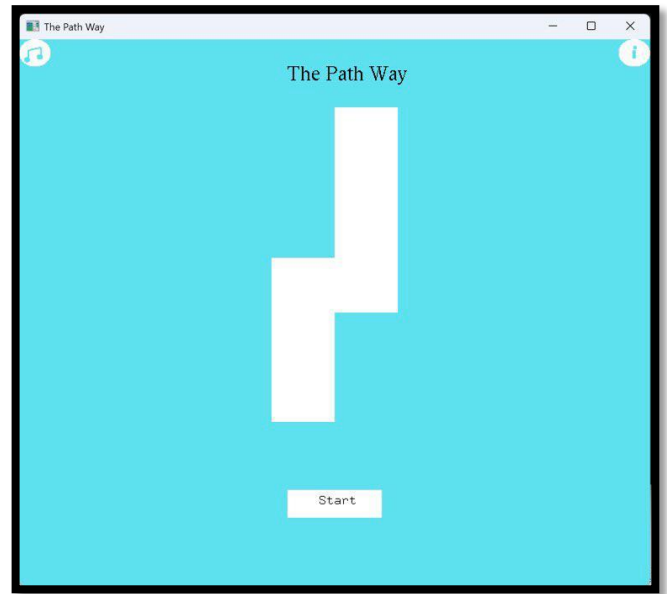
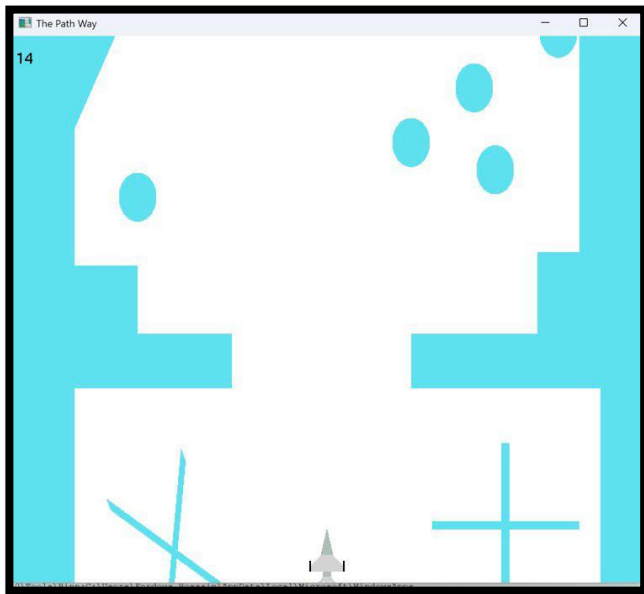
- Game Development: As a developer, designer, or programmer.
- Graphics Engineering: Enhancing visual technologies.
- Animation and Simulation: Creating visuals for diverse industries.
- Research and Academia: Exploring advanced graphics and AI integration.

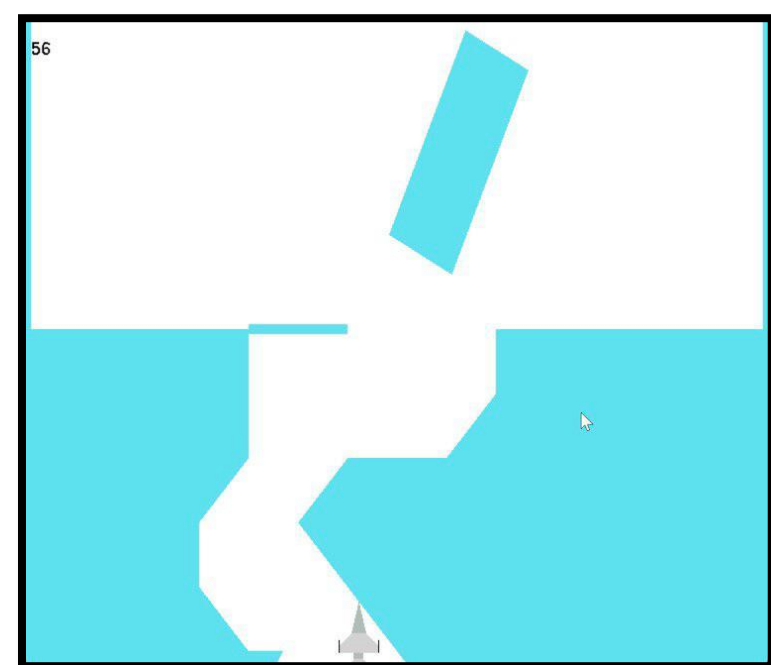
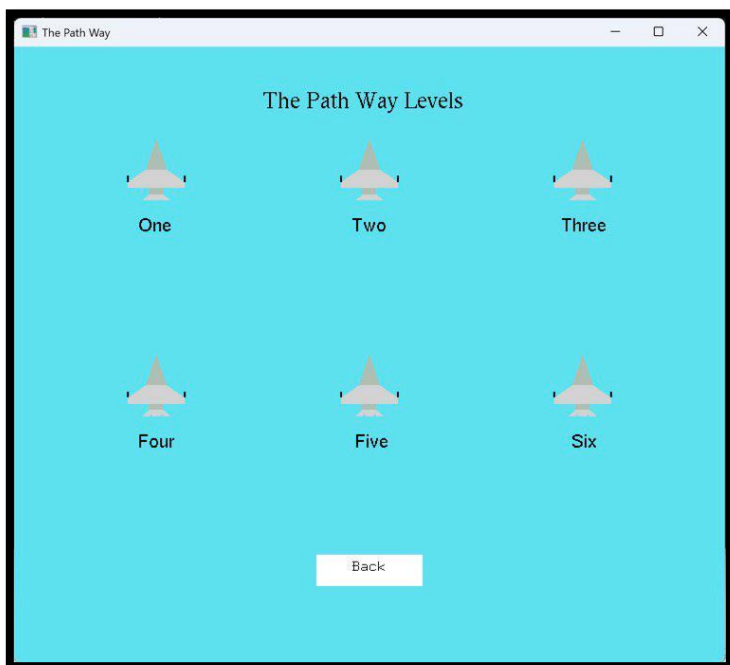
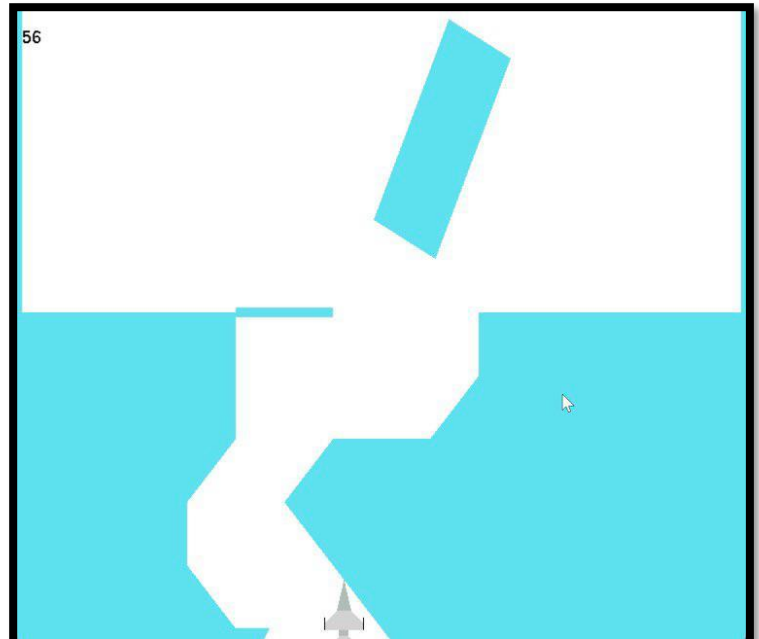
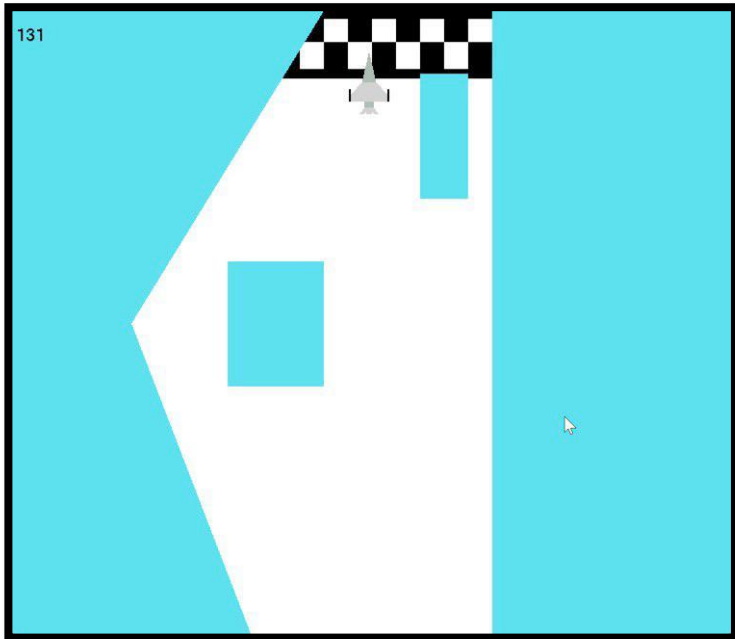
## Higher Education and Research

“THE PATHWAY” might help us in:

- Advanced Research: In procedural generation, AI in games, and graphics optimization.
- Graduate Programs: Pursuing higher education in computer science, game development, or multimedia technologies.

## Game Screenshots:





## Key Challenges Faced

- Optimization: Balancing performance and graphical fidelity for a smooth user experience.

- Physics Integration: Ensuring accurate and efficient collision detection.
- User Feedback: Incorporating player suggestions into iterative designs.

### **Unsolved Bugs**

1. Rendering Issues: Game over and level complete window logic issues.
2. Physics Glitches: No polygon to circle collision logic incorporate.

### **9. References**

- Foley, J. D., van Dam, A., Feiner, S. K., & Hughes, J. F. (1996). Computer Graphics: Principles and Practice.
- CHATGPT AND BLACKBOX AI