

Puzzle Game – Project Report

Abdelillah Serghine - G: 02 IASD

1. Introduction

The **Puzzle Game** is an application developed in **Unity** using **C#**.

Its main objective is to provide users with an engaging and interactive environment where they can solve puzzles by ordering them in the correct order.

2. Objectives

The project was designed with the following goals:

- Develop an **interactive 3D puzzle-solving game**.
 - Enhance **user immersion** through realistic object manipulation.
 - Implement a **timer system** to track performance.
 - Provide a fun yet **mentally challenging** environment.
 - Explore **Unity capabilities** and specific mechanics.
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3. Tools and Technologies

- **Unity** (2021+)
 - **C#** (for game logic and interactivity)
 - **Assets** (for puzzle pieces and environment (created inside unity))
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4. Game Design

4.1 Gameplay Concept

- The player enters the game where a disassembled puzzle is displayed.
- Puzzle pieces can be **replaced** using the mouse.
- Once all pieces are correctly placed, the puzzle is completed.

4.2 Features

- **Interactive Puzzle Pieces:** Players can move objects realistically.
- **Timer System:** Measures how long it takes to complete the puzzle.
- **Immersive Environment:** 3D background to enhance realism.

4.3 User Interaction

- **Grab & Drop mechanics** implemented with XR Grab Interactable.
 - **Collision detection** ensures puzzle pieces snap correctly into place.
 - **UI Elements** for timer and restart options.
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5. Implementation Details

1. Scene Setup:

- An environment with a table and puzzle board.
- Lighting and textures for realism.

2. Puzzle Mechanics:

- Puzzle pieces modeled and divided into smaller parts.

- Each piece contains a collider and rigidbody.
- Snap points defined for correct placement.

3. Game Logic (C# Scripts):

- PieceController: handles movement & snapping.
- GameManager: tracks time, and completion.
- UIController: manages UI elements.

4. Testing:

- Tested with mouse.
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6. Results

- Successfully built a **fully playable puzzle game**.
 - Smooth object manipulation and accurate snapping mechanism.
 - Performance is stable with no major frame drops.
 - Positive feedback from testers: **intuitive gameplay, engaging mechanics**.
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7. Limitations

- Limited to **one puzzle level** in current version.
 - Graphics can be improved with higher-quality assets.
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8. Future Work

- Add **multiple puzzle levels** with increasing complexity.
 - Introduce **multiplayer mode** for collaborative puzzle-solving.
 - Improve **visuals and animations** for realism.
 - Add **leaderboard system** to encourage competition.
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9. Conclusion

The PuzzleGame project demonstrates how **Unity and C#** can be combined to create an **interactive game**.

It not only challenges players cognitively but also showcases the potential of 3D in **educational and entertainment applications**.