



人工智能与计算机学院

School of Artificial Intelligence & Computer Science

Unit 5 User Interface Report

Course Title: User Interface Design with Unity

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Introduction

User Interface Design (UID) is a fundamental aspect of software and game development that focuses on creating visually appealing, interactive, and user-friendly interfaces. This report highlights key learnings and skills gained while working with Unity for UI design. The process involved implementing various functionalities and utilizing Unity's built-in tools to create an interactive experience.

Key Functionalities Implemented

1. Object Tossing and Interaction

- **Functionality:**
 - Objects appear at random intervals with varying speeds, positions, and rotations.
 - Users can click on objects to destroy them, triggering particle effects and updating the score.
 - **UID Concepts Learned:**
 - **2D View:** Designed layouts for smooth interactions in a 2D environment.
 - **Mouse Events:** Enabled object destruction and game interaction through click events.
 - **Game Manager:** Created a centralized system for controlling game mechanics and updating the UI dynamically.
 - **Lists:** Efficiently managed dynamic game objects.
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2. Score Tracking and Particle Effects

- **Functionality:**
 - Implemented a UI element to display the current score.
 - Triggered particle explosions upon successful interactions.
- **UID Concepts Learned:**
 - **TextMeshPro:** Used to create high-quality, dynamic text components for the score.

- **Canvas:** Organized UI elements like buttons and text in a structured manner.
 - **Anchor Points:** Scaled and positioned elements for different screen resolutions.
 - **Reusable Scripts:** Modularized code for updating scores and handling particle effects efficiently.
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3. Game Over and Restart Features

- **Functionality:**
 - Developed a Game Over screen with an interactive restart button to reset the game.
 - **UID Concepts Learned:**
 - **Game States:** Managed states such as "playing," "game over," and "restarting" using boolean logic.
 - **Interactive Buttons:** Created buttons with OnClick events to enable user interaction.
 - **Scene Management:** Reloaded scenes seamlessly to restart the game.
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4. Title Screen and Difficulty Selection

- **Functionality:**
 - Added a title screen to start the game and choose difficulty levels, impacting game complexity and object spawn rates.
 - **UID Concepts Learned:**
 - **Dynamic Event Handlers:** Used `AddListener()` to assign actions dynamically to buttons.
 - **Inter-Script Communication:** Passed parameters between scripts to adjust gameplay based on difficulty.
 - **Child Object Grouping:** Organized UI elements hierarchically for better clarity and control.
 - **Game Variables:** Utilized operators for dynamic adjustments in game behavior.
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Additional Concepts Learned

1. **Library Integration:** Leveraged Unity's built-in libraries for UI and particle effects.
 2. **Modular Programming:** Connected scripts to ensure reusability and maintainability.
 3. **Boolean Logic:** Controlled transitions and game flow effectively.
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Challenges Faced

1. **UI Scaling:** Ensured consistent UI presentation across various screen resolutions using canvas scaling and anchor points.
 2. **Game State Transitions:** Overcame initial difficulties in managing smooth transitions between states like "playing" and "game over."
 3. **Balanced Difficulty:** Iteratively tested and fine-tuned difficulty levels to achieve fair gameplay.
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Future Scope

- **Advanced Animations:** Add animations to UI elements for better engagement.
 - **New Features:** Incorporate timers, leaderboards, and other advanced UI elements.
 - **Accessibility:** Implement inclusive features for a broader audience.
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Conclusion

The project offered a comprehensive understanding of UI design principles using Unity. From managing interactive elements to creating a seamless user experience, the knowledge and skills gained have laid a strong foundation for building more complex and immersive applications in the future.