

CS5008

Prof. Hamandi, Lama

Tile Conqueror —Path-Finding Algorithms In Game

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1. Introduction:

- a. Our project demonstrates the application of path-finding algorithms in a gaming context, inviting players to interact with and challenge algorithmic agents within a game environment.
- b. Key Focus: Algorithm modification for game AI, game logic, and GUI implementation using OpenGL.

2. Key Insights:

- a. Algorithm Adaptation for Game AI:
 - i. Traditional depth-first search (DFS) algorithm adjustments to simulate "not-so-smart" AI, allowing players to outsmart the game agent.
 - ii. Strategy: Prioritize direction closest to the endpoint and halt search upon finding a viable path to ensure playability and maintain game flow.
- b. Game Logic Overview:
 - i. The game operates on an event-driven basis, reacting to player inputs like button clicks to progress through rounds or place obstacles.
 - ii. Dynamic interaction through obstacle placement and round progression challenges the agent's path-finding capabilities, offering a hands-on experience with algorithm efficiency and adaptability.
- c. GUI Implementation with OpenGL:

- i. Utilization of OpenGL for rendering the game's graphical interface, showcasing the flexibility and application of computer graphics in game development.
- ii. Highlights the practical use of OpenGL in drawing and updating game elements in response to gameplay events.

3. Learning Outcomes:

- a. Deepened understanding of path-finding algorithms and their practical applications in problem-solving and game AI development.
- b. Gained experience in using OpenGL for game graphics, enhancing skills in both programming and computer graphics.
- c. Developed competence in creating an event-driven game logic, emphasizing the importance of interactive and responsive game design.

4. Areas for Improvement:

- a. Directional flexibility: Current limitations in start and endpoint positions suggest the need for a dynamic priority queue system for direction selection.
- b. Advanced OpenGL Features: Expanding beyond basic implementation to explore more sophisticated graphical techniques and functionalities.

5. Conclusion:

- a. Our project merges algorithm theory with practical application, offering insights into the modification of path-finding algorithms for gaming AI, the complexity of game logic, and the basics of OpenGL. The project not only showcases our technical skills but also our creative approach to problem-solving and game design.