AI DigDug Game

Inteligencia Aritificial

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Files

- **mapa.py:**
    - Generates a dynamic game map, laying the groundwork for DigDug's environment.
    - Influences the AI's decision-making by defining the context of the game.
- **server.py:**
    - Server of the game, coordinate interactions between the game server and the AI agent.
    - Facilitates real-time updates on the game state, ensuring the AI's responsiveness.
- **student.py:**
    - Embodies the AI agent, encapsulating its decision-making logic and strategies.
    - Initiates actions, such as movement and attacks, based on the information received from the game server.

Search Algorithm

- Defines the problem with the game map, initial position, destination, and obstacles.
- Evaluates possible actions, valid states, and calculates action costs and heuristics.
- Utilizes Breadth-First Search (BFS) algorithm to explore possible paths.
- Determines the optimal path from the initial state to the destination, considering obstacles.

Playing Style

- **Detailed Monster Interaction:**
  - Condition: Evaluates the closest monster's direction and position relative to Digdug.
  - Action: Determines whether engagement or avoidance is possible based on the monster's position and direction.
- **Death Avoidance and Movement Decisions:**
  - Condition: Assesses potential death scenarios before making a move (e.g., if not die(...)).
  - Action: Chooses a movement action that avoids death and progresses towards the goal.
- **Directional Decisions Based on Obstacles:**
  - Condition: Considers Digdug's current direction and potential obstacles.
  - Action: Adjusts the movement strategy to navigate around obstacles safely.
- **Proximity-Based Decision Making:**
  - Condition: Analyzes the proximity between Digdug and the monsters (e.g., if_monster_in_front())
  - Action: Decides on the best course of action based on the relative positions of Digdug and monsters.

Results

- In the initial iteration, the average score hovered around 15,000 points. The current average score showcases a marked improvement, fluctuating between 20,000 and 25,000 points. This variance is attributed to the diverse map structures encountered, necessitating nuanced adaptations in the agent's behavior for optimal outcomes.
- The professor updates in enemies behaviors positively impacted DigDug's survivability and strategic maneuvers, who boosted digdug performance.
- The emergence of a gameplay challenge becomes conspicuous from level 7 onward. Here, the intricate dance between DigDug's cautious approach and the relentless pursuit of monsters results in a recurrent deadlock. This presents a unique strategic hurdle, demanding further exploration for an effective breakthrough.
- Despite rigorous bug resolution efforts, certain issues persisted without significantly enhancing final results.