

Research on automatic character control techniques and applications

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Abstract: This thesis investigates techniques for autonomous character control and their practical applications in interactive digital environments. The research addresses the challenge of creating believable, adaptive non-player characters (NPCs) that can operate without direct human input. We propose a hybrid control architecture combining finite state machines for structured behavior with reinforcement learning for adaptive decision-making. The system integrates perception modules, pathfinding algorithms, and action selection mechanisms to enable characters to navigate complex terrains, interact with objects, and respond dynamically to environmental changes. Experimental evaluations were conducted in a simulated virtual environment, comparing our approach against traditional scripted behaviors. Results demonstrate significant improvements in character responsiveness, task completion rates, and perceived realism. The study further explores applications in gaming, virtual training simulations, and autonomous robotics. Findings suggest that the proposed framework offers a scalable solution for developing intelligent autonomous agents, with potential to enhance user immersion and reduce development overhead in interactive systems.

Keywords: automatic character control, control techniques, applications, virtual character