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AI for Happiness: Pedestrian Path Generation through Agent-Based Simulations with Deep Reinforcement Learning

AI integration in Smart Cities, primarily through agent-based simulations, holds transformative potential for understanding and enhancing citizen behavior. Striking a balance between complexity and computational feasibility is essential. Our research question is, how can we make agents behave more realistically? We assumed that happiness is a motivating factor for the mobility. Insights from a survey of 130 citizens inform our weightings. We used reinforcement learning (RL) as a method and Q-learning as an algorithm to generate a baseline, further enhanced with neural networks for adaptability. This study contributes to data-driven urban design by offering efficient intelligent agent solutions. The research lays foundations for smart agents in urban design, which can be used to generate synthetic data.

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Keywords

artificial intelligence, synthetic data, smart cities, deep reinforcement learning, design

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