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Simulation of Obstacle Avoidance for Multiple Autonomous Vehicles in a Dynamic Environment Using Q-Learning

Authors : Andreas D. Jansson

Abstract : The availability of inexpensive, yet competent hardware allows for increased level of automation and self-optimization in the context of Industry 4.0. However, such agents require high quality information about their surroundings along with a robust strategy for collision avoidance, as they may cause expensive damage to equipment or other agents otherwise. Manually defining a strategy to cover all possibilities is both time-consuming and counter-productive given the capabilities of modern hardware. This paper explores the idea of a model-free self-optimizing obstacle avoidance strategy for multiple autonomous agents in a simulated dynamic environment using the Q-learning algorithm.

Keywords : autonomous vehicles, industry 4.0, multi-agent system, obstacle avoidance, Q-learning, simulation
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