

COGNITIVE AGENTS LEARNING TO CROSS A CA BASED HIGHWAY

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ABSTRACT. Autonomous driverless cars, drones, and swarm robots must learn how to operate in dynamically changing environments. Thus, for their further advancements it is important to study how various parameters of such environments affect autonomous robots learning performance. Some of these studies may be carried out through modeling and simulations in which autonomous robots can be identified with cognitive agents. The presented work falls into this category and presents a model of simple cognitive agents learning to cross a cellular automaton (CA) based highway under various traffic conditions. Various populations of cognitive agents, homogeneous one and the ones containing risk takers and/or risk avoiders are considered. The agents use simple learning algorithms inspired by biomimicry, which are based on an observational social learning strategy in which agents learn by observing the performance of other agents, mimicking what worked for them and avoiding what did not in the past. The effects of transfer of agents knowledge base built in one traffic environment to the agents learning to cross in a different traffic environment on their performance is investigated for two different decision-making processes that the agents use.

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