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Hybrid Social Force-Fuzzy Logic Evacuation Simulation Model for Multiple Exits (Conference Paper)

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Abstract   ⌄ View references (16)

One of the most important aspect of evacuation management system, when it comes to organizing a safer large-scale gathering is crowd dynamics. Utilizing evacuation   simulation of crowd dynamics during egress, for planning efficient crowd control can minimize crowd disaster to a great extent. Most of the previous studies on evacuation models have been done over a discrete space which have neglected the uncertainty aspect of an agent's decision making, especially when it comes to panic situations. This study proposes a model for evacuation   simulation under uncertainty conditions in a continuous space via computer simulations. It will focus on developing an intelligent simulation   model utilizing one of the artificial intelligence techniques which is fuzzy logic . Social Force Model will be taken as the base for basic agent motion. Membership functions such as distance from the exit , familiarity and visibility of the exit , density of crowd around the exit are incorporated in the fuzzy logic system to model the system. From our findings, it can be deduced that factors such as density, distance, and familiarity all considerably affect the time of evacuation of agents from the threat place. Indeed, uncertainty aspect influences agents' decision making, thus affecting the result of evacuation time. © 2019 IEEE.

Author keywords

(Fuzzy Logic) (Multiple Exits Evacuation Simulation) (Social Force Model and Crowd Dynamics)

Indexed keywords

Engineering
controlled terms: (Computer circuits) (Decision making) (Dynamics) (Membership functions)

Engineering
uncontrolled terms   (Artificial intelligence techniques) (Crowd dynamics) (Evacuation management)
                         (Evacuation simulation) (Evacuation simulation models) (Fuzzy logic system)
                         (Intelligent simulation model) (Social force models)

Engineering main
heading: (Fuzzy logic)

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