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Abir, I.M., Mohd Ibrahim, A., Toha, S.F., Shafie, A.A.

A review on the hospital evacuation simulation models

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Department of Mechatronics Engineering, International Islamic University Malaysia, Kuala Lumpur, Malaysia

Abstract

Developing a safe, effective, and timely evacuation plan is challenging in complex buildings like hospitals. Although accurate evacuation drills could enhance the efficiency of evacuation strategies, conducting it in health care environments is extremely difficult. Thus, evacuation simulation is more feasible as it could lead to achieving safer evacuation. However, most of the existing literature focuses on normal evacuation instead of assisted evacuation. Assisted evacuation feature is a must to correctly simulate the evacuation of hospital staff and non-ambulant patients. This paper summarizes the main literature studies on hospital evacuation simulation and offers an overview of some of the evacuation models that support assisted evacuation. Based on the review we have summarized the basic modelling requirements for hospital evacuation simulation model. We have also evaluated the reviewed models. Our study found that, some of the existing models (e.g., Building-Exodus, Pathfinder) are capable of simulating hospital evacuation properly. However, most of the existing agent-based evacuation simulations implement rule-based AI rather than self-learning AI. The possibilities of self-learning AI can be explored further. We believe that this review will assist researchers in developing more feasible and reliable hospital evacuation simulation models that will help the hospital authorities to properly evaluate their evacuation strategies and ensure the safety of the hospital occupants. © 2022 Elsevier Ltd

Author Keywords

Assisted evacuation; Evacuation simulation; Hospital evacuation

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Correspondence Address

Mohd Ibrahim A.; Department of Mechatronics Engineering, Malaysia; email: azhar_ibrahim@iium.edu.my

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