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Risk Assessment of Building Fire Evacuation with Stochastic Obstructed Emergency Exit

(Conference Paper)

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Abstract

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Fire evacuation simulation for buildings has greatly enhance the safety of escaping efficiently and give valuable insight for better layout permutation. The aim of this article is to evaluate the safety risk of fire evacuation given a random chance that emergency exits are obstructed. A case study of evacuation pathway was evaluated against fire safety codes and practices in Malaysia. AnyLogic was used to simulate fire evacuation, assuming peak occupancy, with three randomly obstructed emergency exit pathways. Results show that though the floorplan fulfils safety criteria, the risk was high which requires adjustment. Monte Carlo analysis indicates the performance of risk of obstruction of all three emergency exits at one percent probability. Risk assessment points to the need of a minimum number of emergency exits by floor area per exit basis and a reconfiguration of floorplan layout. © 2019 IEEE.

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Author keywords

Agent-based Modelling Simulation Fire risk assessment Monte Carlo Analysis

Indexed keywords

Engineering controlled terms:

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Engineering uncontrolled terms

Building fires Emergency exit Fire evacuation Fire safety codes Floor areas

Monte carlo analysis Safety criterion Safety risks

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