



Article

Physics-based modeling of crowd evacuation in the Unity game engine

February 2018

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Simulation of pedestrian flow with evading and surpassing behavior in a walking passageway

Article Oct 2017 · SIMULATION: Transactions of The Society for Modeling and Simulation International

Xiaolu Jia · Hao Yue · Xin Tian · Huanhuan Yin

The pedestrian flow with evading and surpassing behavior in a walking passageway is simulated based on a modified social force model in order to explore the influence of this behavior on evacuation efficiency, bottleneck passing capacity, and the macroscopic phenomenon. A pair of conjugated self-driven forces is introduced to enable a pedestrian to avoid a direct collision...

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A high-fidelity three-dimensional simulation method for evaluating passenger flow organization and facility layout at metro stations

Article Jun 2017 · SIMULATION: Transactions of The Society for Modeling and Simulation International

Mingwei Hu

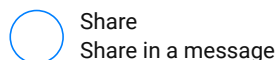
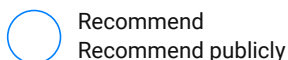
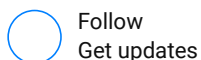
This research proposes a high-fidelity simulation method that integrates the strengths of microscopic pedestrian modeling and three-dimensional (3D) virtual reality (VR) for the evaluation of passenger flow organization and facility layout at metro stations. Passenger flow movements, with detailed spatial-temporal information of each agent, are modeled using agent-based micro...

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Modeling of human behavior in crowds using a cognitive feedback approach

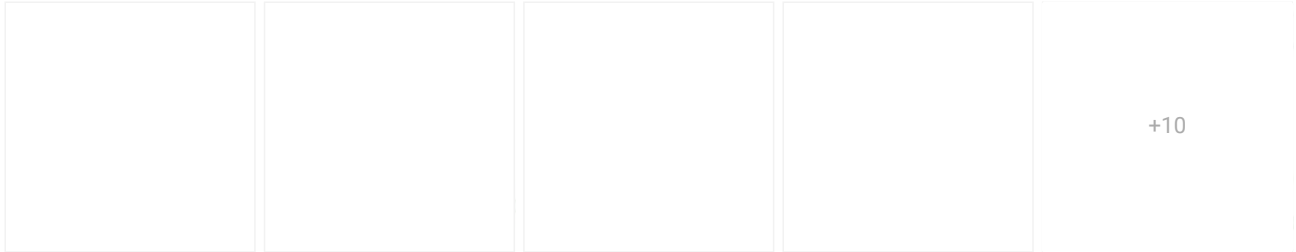
Article Nov 2016 · SIMULATION: Transactions of The Society for Modeling and Simulation International



principles. The application focus is for developing realistic models that address not only the physical but also the psychological aspects of crowd behavior. Our approach to modeling the psychology of a crowd is based on the principle of emotional reflection.

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Emergency crowd evacuation modeling and simulation framework with cellular discrete event systems

Article [Full-text available](#) Jul 2016 · SIMULATION: Transactions of The Society for Modeling and Simulation International

Shafagh Jafer · Ryan Lawler

First responders and security personnel face many challenges to safely evacuate crowded environments. Conducting frequent physical and table-top exercises are neither feasible nor economical. This is where modeling and simulation comes into play in providing a risk-free and economical method to practice various evacuation strategies, train first responders, and provide accurate...

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Simulation of pedestrian evacuation with blind herd mentality under adverse sight conditions

Article Apr 2016 · SIMULATION: Transactions of The Society for Modeling and Simulation International

Hao Yue · Shuai Wang · Xiaolu Jia · [...] · Chunfu Shao

Pedestrian dynamics under adverse sight conditions is a difficult point in the field of pedestrian flow. In this paper, the simulation of pedestrian evacuation flow is carried out with blind herd mentality under adverse sight conditions. The pedestrian sight radius is introduced to describe adverse sight conditions, based on which blind following movement is adopted to describe the blind...

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A simulation model fusing space and agent for indoor dynamic fire evacuation analysis

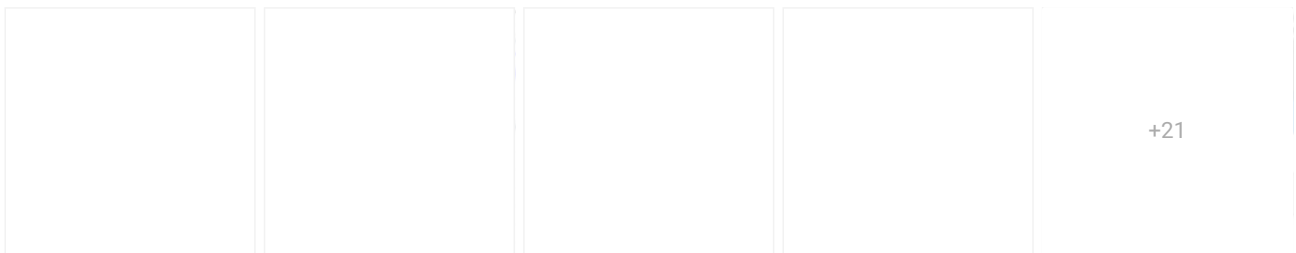
Article Feb 2016 · SIMULATION: Transactions of The Society for Modeling and Simulation International

Lei Niu · Yiquan Song

Research on indoor fire emergency evacuations is crucial for hazard mitigation purposes, and dynamic indoor environments examined in this field demand a flexible solution. Current approaches separately address spatial and human elements of evacuations, producing superficial evacuation analysis results. In this paper, we employ a hierarchical structure to efficiently...

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Modeling pedestrian behavior with Cell-DEVS: Theory and applications

Article [Full-text available](#) Dec 2015 · SIMULATION: Transactions of The Society for Modeling and Simulation International

M. Al-Hachimi · C. A. Weaver

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and we show how to use Cellular Discrete Event System Specification for entity-based modeling and simulation of crowds. We...

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Implementing a physics-based model of crowd movement using the Unreal Development Kit

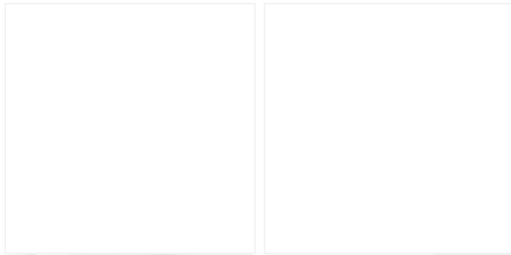
Article Sep 2014

 Mitchell J. Bott ·  Mikel D. Petty

Crowds of people form in both civilian and military contexts, often in emergency or dangerous situations. Consequently, modelling crowd behaviour and movement has consistently been a subject of research, and such models have been used to study, for example, evacuation scenarios and the effect of crowds on military operations. Recreating realistic crowd behaviour and crowd...

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Integrating crowd-behavior modeling into military simulation using game technology

Article [Full-text available](#) Mar 2008 · Simulation & Gaming

 Frederic D. Mckenzie ·  Mikel D. Petty ·  Paul Kruszewski · [...] ·  Eric W. Weisel

Crowds of noncombatants play a large and increasingly recognized role in modern military operations and often create substantial difficulties for the combatant forces involved. However, realistic models of crowds are essentially absent from current military simulations. To address this problem, the authors are developing a crowd simulation capable of generating crowds of...

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Designing Buildings to Cope with Emergencies: Findings from Case Studies on Exit Preference

Article [Full-text available](#) Jun 2013

 Aysu Sagun ·  Chimay J. Anumba ·  Dino Bouchlaghem

Static information found in current building design guidance documents is not adequate to achieve efficient safety and security in public buildings during emergencies. There is a need to consider space characteristics and dynamic information related to building use, behavior and movement of users in various circumstances, as well as their interactions with each other and with...

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Representing the Influence of Signage on Evacuation Behavior within an Evacuation Model

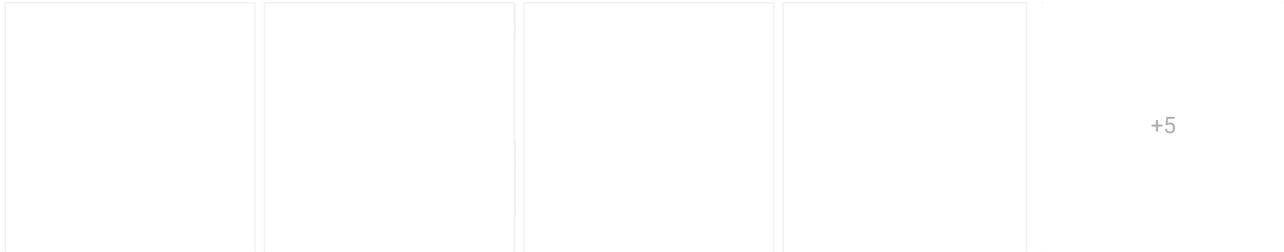
Article [Full-text available](#) Feb 2006 · Journal of Fire Protection Engineering

 Lazaros Filippidis ·  E.R. Galea ·  Steve M.V. Gwynne ·  Peter Lawrence

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Levels of Detail for Crowds and Groups

[Article](#) Dec 2002 · Computer Graphics Forum

Carol O'Sullivan · J. Cassell · H. Vilhjálmsson · [...] · T. Giang

Work on levels of detail for human simulation has occurred mainly on a geometrical level, either by reducing the numbers of polygons representing a virtual human, or replacing them with a two-dimensional imposter. Approaches that reduce the complexity of motions generated have also been proposed. In this paper, we describe ongoing development of a framework for...

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Qualitative overview of some important factors affecting the egress of people in hotel fires

[Article](#) Mar 2000 · International Journal of Hospitality Management

T.L. Graham · D.J. Roberts

Serious fires involving fatalities as well as injuries, frequently arise in buildings where many people are gathered, and whenever they have occurred in hotels and other hospitality environments, such as the MGM Grand Hotel in Las Vegas (1980), or the Cocoanut Grove Dance Hall in Boston (1942), they have, understandably, received much attention. It is often considered the...

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Crowd Simulation for Emergency Response Using BDI Agents Based on Immersive Virtual Reality

[Article](#) Oct 2008 · Simulation Modelling Practice and Theory

Ameya Shendarkar · Karthik Vasudevan · Seungho Lee · Young-Jun Son

This paper presents a novel methodology involving a Virtual Reality (VR)-based Belief, Desire, and Intention (BDI) software agent to construct crowd simulation and demonstrates the use of the same for crowd evacuation management under terrorist bomb attacks in public areas. The proposed BDI agent framework allows modeling of human behavior with a high degree of fidelity. T...

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Minimisation of the risk of trampling in a crowd

[Article](#) Feb 2007 · Mathematics and Computers in Simulation

Ris S. C. Lee · Roger L. Hughes

Over the past decade, there have been many crowd related tragedies. To help avoid such situations a strategy is developed here to improve the safety of pedestrians in densely populated situations. The results of simulations performed on two cases of accidents involving trampling, which occur when pedestrians are moving, illustrate the ability of this modelling strategy for...

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Situated Cellular Agents Approach to Crowd Modeling and Simulation.

Article [Full-text available](#) Aug 2007 · Cybernetics and Systems

 Stefania Bandini ·  Mizar Luca Federici ·  Giuseppe Vizzari



The article describes a multi-agent approach to crowd modeling and simulation. After a brief introduction of the Situated Cellular Agents model, the guidelines to the crowd modeling approach is introduced as a way to support the communication among the different actors that are part of the simulation project team. The approach is then applied to describe a complex scenario...

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Group Behaviors for Systems with Significant Dynamics

Article [Full-text available](#) Jan 1997 · Autonomous Robots

 Jessica K. Hodgins ·  David C. Brogan

Birds, fish, and many other animals travel as a flock, school, or herd. Animals in these groups must remain in close proximity while avoiding collisions with neighbors and with obstacles. We would like to reproduce this behavior for groups of artificial creatures with significant dynamics. In this paper we describe an algorithm for creatures that move as a group and evaluate the...

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Simulating Dynamic Features of Escape Panic

Article [Full-text available](#) Sep 2000 · Nature

 Dirk Helbing ·  Illés J Farkas ·  Tamás Vicsek

One of the most disastrous forms of collective human behaviour is the kind of crowd stampede induced by panic, often leading to fatalities as people are crushed or trampled. Sometimes this behaviour is triggered in life-threatening situations such as fires in crowded buildings; at other times, stampedes can arise during the rush for seats or seemingly without cause. Although engine...

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