

---

## Editorial

---

### ChiKit Au\*

Department of Mechanical Engineering,  
University of Waikato,  
Hillcrest Road, Hamilton 3216, New Zealand  
Email: ckau@waikato.ac.nz  
\*Corresponding author

### Henry Duh

Human Interface Technology Laboratory,  
University of Tasmania,  
V108, Newnham Campus, Hobart,  
TAS 7248, Australia  
Email: Henry.Duh@utas.edu.au

**Biographical notes:** Chi-kit Au received his PhD from the Hong Kong University of Science and technology in 1998. He is a Senior Lecturer in the School of Engineering at the University of Waikato, New Zealand. He was an Assistant Professor at the Nanyang Technological University, Singapore. He is a member of Institution of Professional Engineers New Zealand. His research interests are geometric modelling, humanoid robot, human modelling and CAD/CAM.

Henry Duh is the Head and a Full Professor of Discipline of ICT, Director of HIT Lab Australia at University of Tasmania. He is a Fellow of the IET and BCS, a senior member of both in ACM and IEEE, Australian National Representative of IFIP TC13 on HCI and TC14 on Entertainment Computing; and steering committee member of APCHI Conference. He is the Associate Editor of ACM EiC, editorial board of SPRINGER HCI book series, and Chief Editor of SPRINGER Gaming and Social Effects book series.

---

S. Mohammadian and K. Case study the crowd behaviours by analysing large amount of video observations. Through the analysis, moving patterns and conceptual behaviours are identified which are affected by a set of six parameters. These parameters will be used in the human movement and behaviour simulation by using an agent-based approach. Various situations of building designs are simulated which provide necessary information for crowd management.

In the second paper, H. Lee points out that the human crowdedness in the emergency situation is usually ignored in the control methods for evacuation simulation. He presents an approach to compute the shortest evacuation route in a room to the exit by using Q-learning method with the consideration of human crowdedness. Look-ahead crowdedness estimation is suggested by using the maximum allowable crowdedness which will be considered during the evacuation route generation. Using this method for guiding evacuation routes in several emergency situations is demonstrated in the evacuation simulation.

J. Almeida, R.J.F. Rossetti, B.M. Faria and A.L. Coelho present a set of experiments using serious games to elicit human behaviour in evacuation in the third paper. Population sample of various age groups are involved in the simulation experiments with different scenarios of fire alarm id, exit-choice and auditorium. The simulation emphasises on the effects of ageing population and their intrinsic characteristics in fire accident evacuation scenarios. Furthermore, serious games concept is employed in the simulation.

The fourth and the last paper refer to the distortion of space time due to the congestion during evacuation. C. Au discussed the linkage between social behaviour and spatial structure using an example of crowd evacuation from a room with two exits under normal condition. An individual selects the path of least time to leave the room which is a geodesic in the space time. The crowd size accumulated around the exit distorts the space time and affects the geodesic. As the space time geometry of the space time is complicated, an equivalent time delay due to the congestion at the exit is used to explain the path selection.

However, the evacuation path selection in a room with two exits will be completely different under panic condition. V. Tan and C. Au demonstrate the situation by using the same space time distortion principle with a different individual moving velocity model to show the herding behaviour. This is mainly due to the increase in moving speed and decrease in inter-individual distance in the crowd which distorts the space time differently and causes the herding behaviours.

We would like to thank Professor Shana Smith, the Editor-in-Chief of this journal for her support and effort throughout the whole publication process of this special issue. We are also grateful to the authors for their submissions and the reviewers for their professional and timely work.