International Symposium on Human Behaviour in Fires 2026

Programme

6th–8th October 2026, Campus Helsingborg, Lund University, Sweden

Tuesday, 6th October 2026

14:00–17:00	**Egressibility Workshop** A workshop dedicated to the topic of egressibility, i.e., accessibility to means of evacuation for everyone. Organised in collaboration with CASE and the Proactive Ageing profile area at Lund University. Priority attendance given to PhD students.

Wednesday, 7th October 2026

08:30–09:15	**Registration desk**
09:15–09:30	**Welcome**
09:30–10:15	**Keynote 1 - Promoting Ecological Validity by Reducing Discomfort in Virtual Reality** Robert W. Lindeman *University of Canterbury, NZ* All simulations make simplifying assumptions, usually for the sake of things like cost, hazardousness, access, or scalability. The first-person nature of virtual reality (VR) makes it a very attractive approach for triggering realistic human behaviours or playing out "What if..." scenarios. But using VR presents its own challenges and limitations. In this talk, I will discuss some of the work we have been doing to make VR simulations more ecologically valid. I will discuss topics such as the strengths and weaknesses of providing multisensory cues, ways of measuring VR users, and other topics that I hope will help attendees design more effective VR simulations to predict real-world human behaviour.

10:20–11:00

Session 1a: Hospital evacuation

2 talks, Room U202, Chair: Steve Gwynne

> Training of hospital staff on fire evacuation safety
> *Silvia Arias*

> An anxiety analysis of hospital evacuation under visibility loss
> *Zimo Liu, Hongwei Liu, Nur Farhana Azmi, Farid Wajdi Akashah*

Session 1b: Virtual Reality

2 talks, Room U203, Chair: Axel Mossberg

> Virtual crowds, same decisions? The influence of immersion and agent realism on evacuation behavior
> *Leonie Terfurth, Simon Burkard, Max Kinateder, Lars Gerhold*

> Response to sub-incapacitating hypercapnic and hypoxic exposures in older adults during egress
> *Bronwyn Forrest, Paolo Dominelli, Elizabeth Weckman*

11:00–11:30

Coffee break

11:30–12:30

Session 2a: Crowd modelling and management

3 talks, Room U202, Chair: Peter Thompson

> Beyond Density and Speed: A Multi-Dimensional Signal Processing Approach to Pedestrian Evacuation Time Attribution
> *Wentao Chen, Nikolai W. F. Bode*

> Bridging social-psychological motivation theory and Pedestrian dynamics in bottleneck scenarios
> *Ezel Usten, Mohcine Chraibi, Anna Sieben, Armin Seyfried*

> Decoding the patterns of lane formation: Is stochasticity needed to capture crowd dynamics in corridors?
> *Sabrina Kern, Gerta Köster*

Session 2b: Virtual Reality

3 talks, Room U203, Chair: Yuxin Zhang

> Overground walking in VR evacuation studies: design considerations and reproducibility guidelines
> *Luke de Schot, Ruggiero Lovreglio, Daniel Nilsson*

> Virtual Reality crowd movements on a treadmill
> *Zara Jancys, T Macdonald, Daniel Nilsson, Luke de Schot, N Harding*

> Impact of obstacles on pedestrian wayfinding and evacuation behavior in a multi-level building - a virtual reality study
> *Yan Feng*

12:30–13:30

Lunch

13:30–14:15

Poster session 1 [Even poster numbers | e.g., 2, 4, 6]

14:15–15:35

Session 3a: Egressibility

4 talks, Room U202, Chair: Karen Boyce

> Insights into single file pedestrian movement with the presence of older and mobility impaired individuals
> *Hossein Tavana, Karen Boyce, Peter Thompson, F. McAleese, F. Schaub*

> The role of mobility profiles and urgency in pedestrian dynamics of heterogeneous crowds
> *Paul Geoerg, Ann Katrin Boomers, Maxine Berthiaume, Maik Boltes, Peter Thompson, Noureddine Benichou, Max Kinateder*

> The impact of handrail use in the walking speed of school children descending stairs unimpeded
> *Rosaria Ono, Fulvio Vittorino, Marcos Vargas Valentim*

> The FAIR model of pre-evacuation behavior in built environment
> *Abdelmoutaleb Noumeur, Mohd Zahirasri Mohd Tohir*

Session 3b: Evacuation drills

4 talks, Room U203, Chair: Anne Templeton

> Behaviour-Dependent Stair Capacity under Super-Aging Conditions: Empirical Evidence from High-Rise Theatre Evacuation Drills
> *Tomonori Sano, Sohei Suzuki*

> Chair-returning behaviour and its effect on children's pre-evacuation time in kindergarten fire drills
> *Hongwei Liu, Zimo Liu, Mei Ye Kho, Farid Wajdi Akashah*

> Assessing evacuation drill effectiveness: Insights from a multi-building pilot study on standard metrics and adaptive behaviours
> *C. Natalie van der Wal, Arie Adriaensen, Steven Gwynne*

> Impact of Stair Width on Flow Characteristics in Descending Staircase Experiments
> *Nanako Funaki, Jun-ichi Yamaguchi, Akihide Jo, Manabu Tange, Yoshifumi Ohmiya, Tomonori Sano*

15:35–16:00

Coffee break

16:00–17:00

Session 4a: Egressibility

3 talks, Room U202, Chair: Rosaria Ono

> Co-Producing Fire Safety Training and Resources for Social Workers Supporting Older Adults: A Qualitative Evaluation
> *Peter Cassidy, Nigel C. McConnell, Karen Boyce*

> Between autonomy and safety: a qualitative exploration of fire safety realities in care dependent housing
> *Johan van der Graaf, Margrethe Kobes, Lieuwe de Witte*

> A reflective decision framework for fire safety in care dependent housing: Integrating seven perspectives to align care, evacuation dependency, and the built environment
> *Margrethe Kobes, Johan van der Graaf, Lieuwe de Witte*

Session 4b: Evacuation behaviour

3 talks, Room U203, Chair: Arturo Cuesta

> Observations from an announced community wildfire evacuation exercise in Kelowna, British Columbia
> *Max Kinateder, Maxine Berthiaume, Noureddine Benichou*

> Impact of reduced visibility on driving behavior during an evacuation in virtual reality
> *Maxine Berthiaume, Arthur Rohaert, Max Kinateder, Enrico Ronchi, Noureddine Bénichou*

> Architectural Design Factors Influencing Exit-sign Following Among Autistic Adolescents in VR Evacuation Tasks
> *Hanieh Nourkojouri, Mohammad Tahsildoost, Saeed Bakhtiyari*

19:00–…

Symposium Dinner

Clarion Hotel Sea U

Thursday, 8th October 2026

09:15–10:00

Keynote 2 - The History of Human Behaviour in Fire Research

The History of Human Behaviour in Fires Research
Karen Boyce, University of Ulster
This presentation outlines the evolution of human behaviour in fire research over the last 70 years, highlighting some of the key milestones and contributions in its path to international recognition as a discipline. It will consider how the focus of our research has been shaped by regulatory and societal changes and expectations and how research approaches have evolved with technological advancements. It will provide an overview of key dissemination platforms including the human behaviour in fire symposium series and provide a backdrop for discussions regarding the future direction of the field.

10:00–11:00

Session 5a: Crowd movement and modelling

3 talks, Room U202, Chair: Mohcine Chraibi

Calculation of car park occupant load using Monte Carlo simulations
Michael Spearpoint, Danny Hopkin

An experimental investigation of the impact of inward opening doors on evacuation dynamics
Martin Forssberg, Alexander M. Elias, Håkan Frantzich, Johan Lundin

Diversifying a first-principles crowd movement model with 'choice reaction times' and demographics
Peter Thompson, Paul Geoerg, Hui Xie, Daniel Nilsson

Session 5b: Visibility and toxicity

3 talks, Room U203, Chair: Brian Meacham

Experimental Study on Visible Distance of Emergency Exit Signs in Smoke-Filled Environments Accounting for Veiling due to Scattered Light
Daisaku Nii, Yuki Akizuki, Hideki Yamaguchi, Kohei Ueda, Yoshikazu Deguchi, Shunya Urayama, Kimika Hoshino, Kazunori Harada, Sun Anyang

Potential for utilizing VR technology in visible distance measurement under scattered white smoke
Yuki Akizuki, Hideki Yamaguchi, Shunya Urayama, Nozomu Yoshizawa, Daisaku Nii, Kohei Ueda, Yoshikazu Deguchi

An approach to study the impact of carbon dioxide and low oxygen on behaviours and decision-making using virtual reality
Bronwyn Forrest, Harding, N, Paolo Dominelli, Elizabeth Weckman, Daniel Nilsson

11:00–11:30

Coffee break

11:30–12:30

Session 6a: Wildfire evacuation

3 talks, Room U202, Chair: Max Kinateder

> Feature selection in data-driven wildfire evacuation decisions: the 2023 Tenerife wildfire study
> *Arturo Cuesta, Javier Gonzalez-Villa, Ondrej Uhlík, Daniel Alvear*

> Households' Evacuation Behavior In The 2018 Mati And 2023 Maui Wildfires
> *Farhad Sedighi, Xuehan Jing, Chenqiang Liu, Haizhong Wang*

> Corrosive or Cohesive? Social Realities of Wildfires in Rural Alberta
> *Sydney Dyck*

Session 6b: Training

3 talks, Room U203, Chair: Silvia Arias

> Cross-national validation of an augmented reality tool for fire safety training: A French-English comparison
> *Lorraine Ilda Domgue Kamwa, Ruggiero Lovreglio, Anass Rahouti, Thierry Descamps, Selim Datoussaid*

> Developing an interactive virtual reality evacuation training environment for airplane cabin crew
> *Filip D Jędrzejczyk, John Ewer, Edwin R Galea, Peter Lawrence, Xie Hui*

> Fire safety perception of typical building occupants in Portugal
> *João Emílio Almeida, Maria João Freitas, Elisabete da Cunha Cordeiro*

12:30–13:30

Lunch

13:30–14:15

Poster session 2 [Odd poster numbers | e.g., 1, 3, 5]

14:15–15:15

Session 7a: Evacuation signage and decision making

3 talks, Room U202, Chair: Nan Li

> Towards active outdoor emergency signage
> *Eliseu Amaro, Silvia Arias, Enrico Ronchi*

> Developing signage for elevator evacuation - a study on comprehension
> *Axel Mossberg*

> Applying the protective action decision model to assess occupant performance in dwelling fires
> *Lynn Hulse, Asim Siddiqui, Ed Galea, Steve Gwynne, O. F. Thompson*

Session 7b: AI/AR applications for evacuation

3 talks, Room U203, Chair: Michael Spearpoint

> Towards Intelligent and Safer Building Fire Evacuation via Reinforcement Learning-Based Path Planning
> *Hongqiang Fang, Wai Cheong Tam, Md. Ismail Siddiqi Emon*

> IFEA: An AI-Powered Multi-Model Fire Evacuation Analyzer
> *Botao Zhang, Yuxin Zhang, Xinyan Huang*

> Gaze behaviour in GPS-only webAR evacuation guidance
> *Yuta Haneda, Yuka Ikehata, Toshinari Tanaka, Tomonori Sano*

15:15–15:45	**Coffee break**
15:45–16:25	**Session 8a: Emergency communication** 2 talks, Room U202, Chair: Nigel McConnell Harnessing social identity in firefighter instructions to improve evacuation outcomes *Anne Templeton, Yunhe Tong, Fergus Neville, Sophia Wagner, Aoife Hunt, Hui Xie, Steve Gwynne, Peter Thompson* Following the message: simulating adherence to emergency communication in crowd evacuation *Sophia Johanna Wagner, Anne Templeton, Gerta Köster* **Session 8b: Evacuation experiments** 2 talks, Room U203, Chair: Tomonori Sano Impact of heavy double doors on evacuation flow: A multi-year analysis of theatre evacuation drills *Mineko Imanishi, Tomonori Sano, Sohei Suzuki* Effects of entry order on crowd flow at stair landings with merging: A full-scale experiment *Kosuke Fujii, Masayuki Mizuno, Tomonori Sano*
16:25-16:40	**Final remarks by conference chairs** *Enrico Ronchi, Daniel Nilsson*

Poster Presentations

1. Derivation of an Overcrowding Scale through Pressure Measurement and Physiological Response Analysis
Hyun Seok Jeong, Tae Ryeon Wi, Jun Ho Choi

2. EEG Based Evaluation of Cognitive Responses to Variations in Speech - Acoustic Features in Voice Alarm Systems
Ji Won Gu, Jun Ho Choi

3. Evacuation through inwards opening doors – Impact of individuals with movement impairment
Ivansson, H, Enochsson, M, and Forssberg, M

4. An evaluation of refuge areas for people with mobility impairments: accessibility, usability and design
Kristin Andrée, Håkan Frantzich

5. Exit selection behaviour under active and passive wayfinding conditions: a virtual reality study
Zilin Zhang, James A. Milke

6. Virtual response: leveraging virtual reality to evaluate public education effectiveness in mass casualty emergencies
Niki Boyce, Arnab Majumdar

7. Effects of Low-Speed Pedestrians on Staircase Evacuation Flow in Mixed-Population Crowds
Takeru Washizawa, Nanako Funaki, Akihide Jo, Jun-ichi Yamaguchi, Manabu Tange, Tomonori Sano, Yoshifumi Ohmiya

8. Exploring the role of alcohol in nightclub fire evacuations through serious game simulations
Juliane da Silva Dávila, João Emílio Almeida, Alexandre Silva de Vargas, Rogério Rogério Cattelan Antocheves de Lima

. pyFDS+Evac: The Bridge Between Crowd and Fire Simulation
Shouldice G, and Borger, Chraibi M

10. Exploring electroencephalography in virtual reality evacuation experiments
Anush Ghazaryan, Yuxi Zhao, Enrico Ronchi

11. Patterns of vulnerability: human behaviour and evacuation in hospital fires in Italy
Giulia De Cet, Vincenzo Puccia, Chiara Vianello, Livio Petriccione

12. An exploratory study on operators' actions for main control room fires in nuclear power plants leading to loss of habitability
Ayako Hirose, Kohei Nonose, Daisuke Takeda, Chun-Yen Li

13. Emergent effects in pedestrian dynamics arising from a public goods game model
Tao Jin, Ryan A. Palmer, Nikolai W.F. Bode

14. Evacuation of elderly people in nursing homes during fire emergencies: a performance-based approach
Stefano Zanut, Giuseppe Amaro, Manuela Farinosi, Chiara Piccolo, Alessandro Meneghini, Giovanni Ferrin

15. A Space-Time Density Diagram model for evaluating staircase evacuation safety including people with mobility impairments
Kanna Kurami, Tomonori Sano

16. Breathing fire: a grid-based approach for interfacing fds fire toxins and aerosols with pedestrian simulations
Luise Reetz, Thushadh Wijesekere, Sophia Johanna Wagner, and Gerta Koster

17. From individual balance control to collective dynamics in ultra-dense crowds
Antoine Tordeux, Thomas Chatagnon, Basma Khelfa, Mohcine Chraibi, Julien Pettre, Armin Seyfried

18. Assessing safety training effectiveness through memory retention and forgetting curves
Leo W. Menzemer, Michael J. Kinsey, Julie Biringer, Steve M.V. Gwynne, Lynn M. Hulse, Aoife Hunt, Mary Keen, Oriol Rios

19. Repositioning the built environment as continuous evacuation training infrastructure: field-identified spatial familiarity deficits across enterprise sites
Samantha Mathews

20. Video analysis of driving behaviours during wildfire evacuations
Hannah Carton, Melody Jasinski, Timothy Young, John Gales, Eric B Kennedy

21. Gap analysis on egressibility of the disabled in the UK building regulatory regime
Denver Gill, Nadia Mofidi

22. A framework for characterizing pre-movement time uncertainty in performance based egress analysis
Graham Smith, Mukesh Tomar, Aishwary Kaushal, Ankit Agrawal

23. Fatigue Effects among Heterogeneous Occupants During Long-distance Stair Evacuation in High-rise Buildings
Zhijian Fu, Heng Zhao, Lin Luo, Shengxian Yang

24. Behaviour of deaf populations during an unannounced evacuation drill
Bilal Soubra, Enrico Ronchi, Ada Malagnino, Giuseppe Amaro, Angelo Venuti, Mariavittoria Fierro, Stefano Zanut

25. Pierside Evacuation of Ships and Barges
Courtney Myers, Morgan Hurley

26. Experimental study on staff-led guidance during fire evacuation in theaters: a virtual reality experiment
Yoshikazu Minegishi

27. Impact of Fire Door Aging on Evacuation Route Tenability in Residential Buildings
Yoolim Lee, Youngjin Kwon

28. Graph Network-based Learned Simulator for Real-Time Pedestrian Evacuation Dynamics in Multi-Level Subway Stations
Tong Lu, Yuxin Zhang, Xinyan Huang

29. Memorability methods for fire safety training to support emergency decision-making
Michael Kinsey, Leo Menzemer, Oriol Rios, Julie Biringer, Lynn Hulse, Steve Gwynne, Aoife Hunt, Mary Keen

Work-in-Progress Posters

30. Influence of personality and psychosocial factors in autonomous vehicles assisted evacuation for the future circular collider project
Ada Malagnino, Andre Henriques, Katia Schenkel, Sebastien Paul Tubau

31. Evaluation of critical fire safety concepts through the application of markov state-transition models
Simon Lay, Luke Bisby, David Rush, Michael Spearpoint

32. Revision to the British standard on the application of fire safety engineering principles to the design of buildings - human behaviour in fire
Michael Spearpoint, Steve Gwynne, Michael Kinsey

33. Using escape window height limits as implicit life safety risk acceptance in case of fire
Michael Spearpoint, A. Robinson, Charlie Hopkin

34. The occupant preparedness assurance gap: measuring competence, not compliance, in fire safety training
Jay Zimmermann

35. Designing a Virtual Reality Experiment to Examine Area of Refuge Use by Wheelchair Users in Underground Stations
Jane Gachuche, Yung-Chi Tan, Silvia Arias, Mohamed Beshir

36. No one left behind: Inclusive fire safety design and digital technologies for primary school evacuation
Francesca Bevilacqua, Marco Orian, Francesco 9Zaccaria, Giulia De Cet, Livio Petriccione, Daniela P. Bos

37. Modelling assisted evacuation of people with disabilities using Pathfinder
Louise Seyer Andersen, Laura Jagd Moustgaard, Bjarne Paulsen Husted

38. The effects of a researcher's presence during vr experiments: a study on human responses during fire alarms
Sebastian Siljehav-Ozimek, Niclas Nilsson