March 2017
Complexity Community Sharing Session
3 Mar (Fri) 11.00am – 1.00pm
Seminar Room 102
(opposite The Hive) Blk 1 Innovation Centre, Level 1
16 Nanyang Drive, Singapore 637722, NTU

Asst Prof. Michael Lees

Modelling Human Crowds - Understanding the Role of Memory in Exploration.

Understanding human behaviour in the context of exploration and navigation is an important but challenging problem. Such understanding can help in the design of safe structures and spaces that implicitly aid humans during evacuation or other emergency situations. In particular, the role that memory plays in this process is something that is crucial to understand. In this talk, I will describe work in which we developed a novel serious game-based experimental approach to understanding the non-randomness and the impact of memory on the human exploration process. We show that a simple memory model, with a depth of between 6 and 8 steps, is sufficient to approximate a 'human-like' level of exploration efficiency. We feel that these findings have important implications for 'safety-by-design' in complex structures. See [details](#) here.

Dr. Michael Lees is an Assistant Professor at the Universiteit van Amsterdam in the Computational Science Lab (Informatics Institute). Prior to this he was an assistant professor at the School of Computer Engineering, Nanyang Technological University (NTU, Singapore). Dr Lees received his PhD from the School of Computer Science at the University of Nottingham, UK. His current research interests are primarily in modelling and simulation of large-scale complex systems. In particular understanding the effect that human behaviour has on urban systems and the important role that individual behavioural interactions have on system level dynamics. His research focuses on the study of human crowds and transportation systems. He is currently workshop chair for the International Conference on Computational Science (ICCS), serves on the programme committee of a number of international conferences and is an editor for the Journal of Computational Science and ACM Transactions on Modeling and Computer Simulation.

Understanding Co-Morbidity from Nation-Wide Medical Data

We derive co-morbidity networks from nation-wide medical claims data and discuss the potentials of knowing the phenotypic health state of a nation. We discuss the implications in terms of prediction health-trajectories, side effects, genetic origins of pathologies, and the efficiency of the Austrian health care system.

Prof. Stefan Thurner

Stefan Thurner is full professor for Science of Complex Systems at the Medical University of Vienna, where he chairs Section for Science of Complex Systems. Since 2007 he is external professor at the Santa Fe Institute and has been a part-time senior researcher at IIASA since 2010. With his engagement at Santa Fe Institute - he shifted his focus from theoretical physics to biological and complex systems, which are now his main scientific areas. Since 1995 Thurner has published more than 170 scientific articles in fundamental, applied mathematics complex systems, life sciences, economics and lately in social sciences. He holds 2 patents.

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