Institute for Advanced Simulation
Jülich Supercomputing Centre

IAS Seminar

Topic: Pedestrian Models based on Rational Behaviour

Speaker: Rafael Bailo, Imperial College London, Department of Mathematics, London, United Kingdom

Contents: Agent dynamics is a vast and prolific field. Following the paradigm set by Attraction-Repulsion-Alignment schemes, a myriad of models have been proposed to calculate the evolution of abstract agents, whether it be to develop CGI simulations of flocking (BOIDS - Reynolds 1987), to simulate the motion of pedestrians (Social Force Model - Helbing, Molnar 1995) or to analyse the development of political opinions (Cucker, Smale 2007). While the emergent features of many agent systems have been described astonishingly well with force-based models, this is not the case for pedestrians. Many of the classical schemes have failed to capture the fine detail of crowd dynamics, and it is unlikely that a purely mechanical model will succeed.

As a response to the mechanistic literature, we will consider a model for pedestrian dynamics that attempts to reproduce the rational behaviour of individual agents through the means of anticipation. Each pedestrian undergoes a two-step time evolution based on a perception stage and a decision stage. We will discuss the validity of the model in regimes with varying degrees of congestion, ultimately presenting a correction to achieve realistic high-density dynamics.

Time: Monday, 10 December 2018, 13:00

Venue: JuLAB building, building 04.11, room 4001e

Rafael Bailo was invited by Dr. Mohcine Chraibi (IAS-7 - Civil Safety Research).