

# HUMAN BEHAVIOUR MODELLING FOR DISCRETE EVENT AND AGENT BASED SIMULATION: A CASE STUDY

Mazlina Abdul Majid, Uwe Aickelin, Peer-Olaf Siebers

School of Computer Science & Information Technology  
University of Nottingham, Nottingham, UK  
Email: {mva,uxa,pos}@cs.nott.ac.uk

## Abstract

This study is about the comparison of simulation techniques between Discrete Event Simulation (DES) and Agent Based Simulation (ABS). DES is one of the best-known types of simulation techniques in Operational Research. Recently, there has been an emergence of another technique, namely ABS. One of the qualities of ABS is that it helps to gain a better understanding of complex systems that involve the interaction of people with their environment as it allows to model concepts like autonomy and proactiveness which are important attributes to consider. Although there is a lot of literature relating to DES and ABS, we have found none that focuses on exploring the capability of both in tackling the human behaviour issues which relates to queuing time and customer satisfaction in the retail sector. Therefore, the objective of this study is to identify empirically the differences between these simulation techniques by stimulating the potential economic benefits of introducing new policies in a department store. To apply the new strategy, the behaviour of consumers in a retail store will be modelled using the DES and ABS approach and the results will be compared. We aim to understand which simulation technique is better suited to human behaviour modelling by investigating the capability of both techniques in predicting the best solution for an organisation in using management practices. Our main concern is to maximise customer satisfaction, for example by minimising their waiting times for the different services provided.

*Keywords: Discrete Event Simulation, Agent Based Simulation, Human Behaviour, Retail*