POSITION DESCRIPTION
PhD Scholarship

Domain: quantitative sociology; social simulation
Topic: Semi-empirical approach to validate massive social simulations
Supervisor: Prof Pascal Perez
Faculty/Division: SMART Infrastructure Facility & Faculty of Informatics
Deadline: 17/10/2011

Topic

The SMART Infrastructure Facility (SMART), University of Wollongong, is currently developing an interactive, visually intuitive and highly flexible simulation platform to support transport and urban planning. In this proof-of-concept agents follow pre-defined daily routines and perceive environmental queues (traffic congestion or land rates) in order to assess the ‘liveability’ of their current situation. The simulation workflow includes an agent-based model (RePAST), a micro-simulation traffic model (TranSims) and an online geospatial visual interface (Google-Map-based).

The present project aims to build a ‘realistic’ population for Sydney Metropolitan Area (Australia) and to evolve this baseline population over a 20-year simulated period. A synthetic population is being developed to adequately match the distribution of individuals and households living in each travel zone, based on the Australian Census and other surveys. Beyond its statistical validity, this artificial society also needs to display decisional and behavioural patterns – based on individual perceptions of ‘liveability’ - consistent with empirical evidence. Designing and validating smart social agents to inform massive social simulation models is a non-trivial task that requires a trans-disciplinary approach including ethnography, quantitative sociology and computer modelling. A range of innovative techniques are used to better represent decisional pathways of Infrastructure planners, managers and users: mobile technology trackers, online surveys and virtual reality platforms.

Benefiting from the flexibility of agent-based simulation design, the research team is currently developing a more versatile approach to activity-based transport models and residential choice models.

PhD Position

The SMART PhD position is a three-year, full time, position ($22,860 per year, non-taxable). The successful candidate will be supervised by Prof Pascal Perez and will develop a semi-empirical approach to designing and validating a massive population of agents to inform a transport and urban planning model. A successful candidate will hold a Master of Science (or equivalent) in Quantitative Sociology or Computer Simulation and will demonstrate a good understanding of agent-based modelling, social complexity and transport simulation.

The PhD student will work in a trans-disciplinary team and will have regular contacts with ethnographers, statisticians and modellers in order to design, calibrate and validate the simulation model. Thus, a successful candidate will display good communication skills and the ability to collaborate in a diverse environment.

For more information: http://smart.uow.edu.au/scholarships/index.html