

SOE 2: Poster

Time: Wednesday 17:00–18:00

Location: P

SOE 2.1 Wed 17:00 P

Scaling properties of bimodal on-demand public transportation — ●PUNEET SHARMA^{1,2}, STEPHAN HERMINGHAUS^{1,2}, HELGE HEUER^{1,2}, STEFFEN MUEHLE¹, and KNUT HEIDEMANN^{1,2} — ¹Max Planck Institute for Dynamics and Self-Organization, Goettingen — ²Georg-August-Universität Göttingen

While modern cities offer various modes of motorized transportation, considered separately, none of them is both efficient, i.e., sustainable, and convenient. A taxi service is convenient, in a sense, due to door-to-door service, but is inefficient since it usually serves one customer only. Demand responsive ride pooling (DRRP) with minibuses is more efficient, but leads to undue competition with line services (LS), which provide even better pooling (average number of passengers per vehicle) but are less convenient due to fixed routes and stops. A combination of both modes, DRRP and LS, may provide an ideal solution but is challenging to organize due to a trade-off between convenience and efficiency. Here we derive conditions for efficient and convenient transportation for a bi-modal service based on a simple square-grid geometry. We relate the optimal mesh size, i.e., distance between stations, to external parameters like passenger density and traveling behavior.

SOE 2.2 Wed 17:00 P

Income inequality from multiple behavioural strategies — ●ANJLEE GOPIANI and JENS CHRISTIAN CLAUSSEN — Mathematics EPS, Aston University Birmingham

Income inequality, and thereby wealth inequality, is a societal problem on national and global scale. Here we investigate a monetary exchange model with interactions motivated from game theory. We assume a diversity of strategies and investigate through agent-based simulations the resulting income distributions in this artificial society. If the majority of agents is acting towards rationality and selflessness to fulfill personal and societal success, inequality is less prevalent.

SOE 2.3 Wed 17:00 P

The Principle of Largest Squares — ●MARTIN ERIK HORN — IU International University of Applied Sciences, Campus Berlin, and ISM International School of Management, Campus Berlin

Regression analysis is an important statistical tool to understand interdependencies between different variables in empirical sciences. And it is astonishing that this tool obviously is used only in Euclidean spaces - as if variables always have to act in an Euclidean way in the scientific world of socio economics and of other domains.

To critically question this Euclidean dominance, orthogonal regression will be transferred into spacetime. The didactical consequences are interesting: We are then discussing relativistic ideas with students who do not study physics, but economics, computer science or other subjects relying on empirical analysis. And the conceptual consequences are surprising: We will no longer apply the principle of least squares but have to switch to the principle of largest squares.

SOE 2.4 Wed 17:00 P

Complexity measures of small-world networks — ●YIPEI ZHAO and JENS CHRISTIAN CLAUSSEN — Mathematics EPS, Aston University Birmingham

While the notion of complexity is established for strings or texts, it is less clear how complexity of a network shall be defined, and various complexity measures have been defined and compared (Claussen 2007, Physica A 375, 365; Kim and Wilhelm 2008, Physica A 387, 2637). Here we compare several of the complexity measures listed in Kim and Wilhelm on small-world networks in comparison to random graphs. We compare Watts-Strogatz graphs in comparison to random graphs that fulfill the small-world property based on the small-world index. The results are in line with the intuition that small-world structure can add to complexity, but reminescent of a lattice structure lower the complexity values.