Complexity

Special Issue on
The Complexity of Mobility and Human Dynamics in Cities

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CALL FOR PAPERS

With the rapid growth of cities, increasingly entangled environments demand new forms of analysis that can only be approached from the point of view of complex systems. In particular, the challenge of creating efficient mobility systems requires taking into account three interconnected aspects: human dynamics, transport, and sustainability. In this sense, cities are incorporating forms of shared transport that coexist with traditional forms. Because the use of one vehicle per individual is out of the question, the solutions envisaged are framed in terms of coexistence between public transport, autonomous vehicles, and shared mobility. Shared Mobility Systems (SMs), in which cars, bicycles, electric scooters, etc. are shared synchronously or asynchronously between users, are experiencing a spectacular boom and are expected to replace other traditional means of transport in the coming decades. Given that public transport displaces large masses of users at fixed times and locations, SMs operate on smaller spatio-temporal scales, allowing for great flexibility. This elasticity implies, of course, a different amount of uncertainty injected into the system. It is therefore necessary to understand the dynamics of SMs and their interaction with traditional mobility patterns.

On the other hand, shared transport is based on social level coordination (social networks) and its implementation is linked to the dynamics of opinions in online social networks, users' attitude towards environmental impact, and other factors. Understanding these patterns in online social networks will allow estimating the speed of penetration of SMs in the system. Finally, each mobility mode has its own environmental impact, and it would be highly desirable to have quantitative estimates of the impact of SMs in terms of energy consumption and sustainability. For example, how energy consumption scales in urban environments with respect to the percentage of existing/predicted SMs. Much knowledge has been gained in the problem of mobility, opinion dynamics, and cooperation in social networks; something more in shared mobility systems and their impact and efficiency. However, these advances have been achieved in their respective fields of knowledge and there is a lack of truly interdisciplinary to address the problem.

The aim of this Special Issue is to collate articles concerning the complexity of new forms of mobility and human dynamics in cities. Mathematical and computational models that capture the relevant aspects of this interrelationship are particularly welcome. Similarly, empirical articles based on the analysis of large amounts of data and review articles that help to visualize and understand the patterns of the three-fold problem behaviour-mobility-sustainability are encouraged.

Potential topics include but are not limited to the following:

- Models and empirical results of human dynamics
- Emergence of virtual communities, opinion dynamics and cooperation in social networks
- Multi-Agent (GIS) based models for transport and mobility
- Network theory and multi-layer spatial networks applied to human dynamics and/or transport
- Cities and scaling; complexity measures and self-organisation
- Data analysis and machine learning methods for transport and human dynamics
- Shared Mobility; energy consumption, efficiency, and impact on the transport system

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/complexity/cmhdc/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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