

## **Modelling of Relocation and Battery Autonomy Problem on Electric Cars Sharing Dynamic by Using Discrete Event Simulation and Petri Net**

**Authors :** Taha Benarbia, Kay W. Axhausen, Anugrah Ilahi

**Abstract :** Electric car sharing system as ecologic transportation increasing in the world. The complexity of managing electric car sharing systems, especially one-way trips and battery autonomy have direct influence to on supply and demand of system. One must be able to precisely model the demand and supply of these systems to better operate electric car sharing and estimate its effect on mobility management and the accessibility that it provides in urban areas. In this context, our work focus to develop performances optimization model of the system based on discrete event simulation and stochastic Petri net. The objective is to search optimal decisions and management parameters of the system in order to fulfil at best demand while minimizing undesirable situations. In this paper, we present new model of electric cars sharing with relocation based on monitoring system. The proposed approach also help to precise the influence of battery charging level on the behaviour of system as important decision parameter of this complex and dynamical system.

**Keywords :** electric car-sharing systems, smart mobility, Petri nets modelling, discrete event simulation

**Conference Title :** ICSCSA 2018 : International Conference on Smart City and Social Access

**Conference Location :** Paris, France

**Conference Dates :** April 19-20, 2018