

COST Action IC1205 on Computational Social Choice: STSM Report**Applicant:** Jurica Babic**Home institution:** University of Zagreb**Home country:** Croatia**Host:** Professor Wolfgang Ketter**Host institution:** Erasmus University Rotterdam, Rotterdam School of Management (RSM)**Host country:** The Netherlands**Dates:** 15/09/2014 to 28/09/2014

The main purpose of my STSM was to study matching potential between electricity prosumers i.e. electric vehicles (EV) and electricity retailers in the context of smart grids. Thanks to useful guidance of productive team members of LARGE (Learning Agents Research Group at Erasmus), we focused our efforts on the possibility of extending the existing parking lot with innovative business models which would in turn put a parking lot owner in a role of an electricity broker. The basic premise is that parked EVs may want to provide their electricity capacities at parking lot's disposal in case they have enough incentives to do so. An EV is able to provide a parking lot with its electricity but can also be used as a storage device that can mitigate the effects of electricity excess imposed by ever-growing intermittent renewables (e.g., wind or solar energy). This idea sparks many interesting research problems including overall model design and how to deal with uncertainties imposed by the proposed model. Since we position our research from the perspective of a parking lot owner, uncertainties relates to both customer market (i.e., tariff market for EVs) and target market on which aggregated electricity capacities from parked EVs are traded. Those uncertainties include: how many cars will be parked at the certain point of time and for how long will they stay parked, how much electricity to store or produce and what price should be paid, what is the expected price on the target market? In essence, we narrowed my PhD project by defining the following research question: *"how to incentivize parking lot transformation into smart parking lot with virtual power plant functionality?"*

To summarize my STSM, it is important to note that the host Professor Wolfgang Ketter at Erasmus University Rotterdam provided me with all necessary resources for an effective two weeks' worth of focused research. Along with my supervisor Assistant Professor Vedran Podobnik I had an invited talk on the topic "Research Challenges in Smart Networks of People, Machines and Organisations". During my STSM we formed a multidisciplinary team of experts from University of Zagreb (Assistant Professor Vedran Podobnik), Erasmus University of Rotterdam (Professor Wolfgang Ketter and Assistant Professor Arthur Carvalho) and University of Minnesota (Doctor John Collins) that will assure the quality of our PhD project. This all proves that my STSM was very successful and for that I thank members of COST Action IC1205.