Ármin Petkovics

EIT Digital Budapest DTC

PhD topic: Energy-efficient optimizing of heterogeneous mobile networks

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'EIT Digital Doctoral School gives me the possi bility to work together with other researchers and groups in Europe through geographical and industrial mobility. Open-mindedness is a key factor in research!'

Achievements & further plans

Ármin is in the final year of his PhD studies. His research topics include **energy efficiency of mobile network providers**, game theory and crowdsensing-based topics, including public transport tracking, incentive mechanisms, gamification and moving towards horizontal architecture in crowdsensing applications. He is planning to spend his geographical mobility at the University of Trento in a well-recognized research group of the topic. His publications include two journal papers and several conference articles in his research area.

Crowdsensing enables the cheap surveillance of mass events such as festivals, where smartphone users provide their sensory data to the organizers of the event in return for discounts, crowd-dependent routing and additional services.

Educational status at Spring semester of 2016:

RA	OR	BMD	GH	Mobility	BDExp.
✓	✓	✓	⚙	⚙	⚙

Reserach topic

My earlier research addressed the consumption-reduction of mobile service providers through their cooperation in geographical areas where they offer services in an overlapped manner. A key question about cooperation is the reallocation of money that is saved due to the cooperation, and it should depend on the amount of work done by each of the providers. This led me to utilize game-theoretic methods to introduce fairness in the cooperation-scenarios.

My current research is addressing the task of crowd surveillance based on data harvested from the sensors of people's mobile phones. It will involve the development of a reliable data-harvesting method, sensor duty-cycling algorithm, and the modeling of crowd movement that can project the findings to the security forces in an easily understandable way. Besides real-time tracking of the crowd, predictions are also favorable for identifying future jamming points so security forces can prepare and act in time before the crowd produces heavy pressure, turbulent movement that can be harmful and may lead to panic situations as well. Graph-based modeling will enable further services to be offered to the security forces and to the people inside the crowd for finding the shortest routes and escape points with the application of graph-algorithms for a particular scenario that are fed with real-time data from the crowd.