János Elek

EIT Digital Budapest DTC

PhD topic: Measurment and monitoring of the future

PhD supervisor: Dr. Gábor Vattay, ELTE

Industrial partner: Ericsson Hungary

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'The EIT Digital Doctoral School enables me to recognize the most relevant business values of my research topic. The courses at the DTC prepared me to present my ideas to people with a more business oriented background.'

Achievements & further plans

In my first two years as a PhD student I worked on a **new model of a telecommunication system** that is more **flexible** and **robust** than the current ones. The creation of such a model was combined with the implementation of a working prototype in which I had managed to connect a so-called **software defined network** with a **datacenter** and create a complex service chain. This accomplishment was presented at multiple conferences with the cooperation of industrial and academic partners. In my last year, I am planning to refine my model and give an exact mathematical description of its inner functioning that stems from the broad topic of traveler purchaser problems.

My new resource allocation algorithm will pave the way for more efficient telecommunication networks, and it will not only increase the revenue of the network operator but also make the system greener by decreasing the energy consumption of the

Educational status at Spring semester of 2016:

RA	OR	BMD	GH	Mobility	BDExp.
✓	✓	✓			

Reserach topic

I have developed a new type of service chaining solutions for telecommunication and also for computer network systems such as the Internet. This solution provides a way of creating network functions such as a router or a firewall on a general hardware infrastructure and forward the traffic of the network to them. Currently, I am focusing on a canonical description of the model.

The mathematical clarification of the model takes most of the properties of a telecommunication system into account. Such properties are the great volume of users, the high speed of them and the limited capacity of the links in the system. There are numerous heuristics for solving the traveling purchaser problem, that is the most appropriate mathematical context of the system, but none of them consider the above properties.

This is a very popular topic among the big agents of the telecommunication industry, such as Ericsson, Cisco or even Google. A scalable and optimal solution would dramatically decrease the maintenance cost of any computer network and make the development of new products much faster. New services could be tested easily and the ever increasing demand for wide bandwidth mobile network coverage could be served without expensive infrastructure upgrades.

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