

# István Pelle

## EIT Digital Budapest DTC

PhD topic: System level error analysis and handling in Software Defined Networks

PhD supervisor: Dr. András Gulyás, BME

Industrial partner: Béla Körmöczi, OPTICON Kft.

Contact: pelle@tmit.bme.hu



'I have just started my studies at EIT Digital, where I think I can learn how to identify adequate business models for creating a successful and innovative consumer product based on my research results.'

### Achievements & further plans

István is in the first year of his PhD studies. His topic is concerned with **troubleshooting in software defined networks**. In this semester, he added new functionality to the framework that he has been developing in the last year. He made it possible to create decision points in the software where results of the separate troubleshooting tools can be evaluated and acted upon. He conducted research in order to find methods suitable for making automatic inferences based on observed symptoms. He chose a method and is now in the process of creating a model to use for software defined networks and making adjustments in the software to accommodate automation.



Network troubleshooting in a Software Defined Networking environment is a complex task. Automatizing the troubleshooting process would have the benefits of quicker SDN controller development time, better network resilience and lower troubleshooting costs.

### Educational status at Spring semester of 2016:



RA



OR



BMD



GH



Mobility



BDExp.

### Reserach topic

The concept of Software Defined Networking clearly simplifies many aspects of networking. The idea of separating the data and control planes in switching devices and opening the control plane to be supervised by a centralized software controller greatly simplifies the definition and deployment of innovative services and also the management of SDN devices.

Parallel to these simplifications SDN makes error analysis and handling more complicated, since complex control functionality results in complex software components. It is highly non-trivial to find causes of errors in such an environment, and it requires the combined expertise of a network and a software engineer. The aided or fully automated error analysis in SDNs is therefore an important and open research problem.

István's current research objective is to find such a model that can describe failure propagation in SDNs and can be used to make inferences to the failure causes based on observed symptoms. His further research goal is to realize a framework that can use this model for automatic error detection while integrating already existing network and software troubleshooting tools and using the minimally required subset of these by applying active diagnostics.