

Dissertation press release**12.02.2020**

Towards scalable communication networks: network design and management

Title of the dissertation Scalable networked systems: analysis and optimization**Contents of the dissertation** The growing *diversity* and *number* of Internet-connected devices result in complex networked systems. For instance, connected devices today range from water meters at homes that have to send data a few times a day to autonomous cars that continuously communicate vital information to other cars in their vicinity. It is challenging for wireless communication networks to ensure that data generated by such diverse devices are transmitted, received and processed efficiently. Furthermore, as the density of connected devices grows, their transmissions may interfere with each other resulting in a drop in reliability. Thus, we need solutions for the intelligent analysis and management of such networks.

This dissertation proposes novel solutions to enable scalable communications in future networked systems. The system relies on secondary access networks to free up cellular spectrum, LoRa connectivity for battery-powered sensors and edge computing to support emerging low latency applications. We propose novel optimization models to manage the network parameters and layout of network devices to enable reliable large-scale connectivity and processing of data. Our solutions are designed to be simple and to be easily implemented by network operators even for large, dense networks.

Field of the dissertation Computer Science**Doctoral candidate** Gopika Premsankar, MSc.**Time of the defence** 28.02.2020 at 12:00**Place of the defence** Aalto University School of Science, lecture hall T2, Konemiehentie 2, 02150 Espoo**Opponent** Professor Francesca Cuomo, Sapienza University of Rome, Italy**Custos** Professor Mario Di Francesco, Aalto University School of Science, Department of Computer Science**Electronic dissertation** <http://urn.fi/URN:ISBN:978-952-60-8947-8>**Doctoral candidate's contact information** Gopika Premsankar
Department of Computer Science,
gopika.premsankar@aalto.fi
+358 46 954 2842