

Wireless Networks Research Group



Vilnius
University

Keywords: 4G LTE, 5G, wireless networks, electromagnetic compatibility, MIMO, Internet of Things, IoT, radio frequency radiation human exposure limits, HetNets, SEAMCAT, embedded electronics, radio link prototyping.



Research group activities

Importance of wireless networks research is reflected by involvement of telecommunications industry in 5G standardization as well as the abundance of numerous international and European state funding programmes. Our research group participates in one of the European COST programmes – IRACON, aimed at development of wireless technologies for 5G and beyond, specifically working in the field of radio channel modelling and Internet of Things (IoT) applications.

When working on research challenges, we cooperate with Oncology Institute of Vilnius University, Lithuanian National Laboratory of Time and Frequency Standards and National Laboratory of Society Health Monitoring.



Proposal

Our research group could provide simulation, modelling and the following:

- Development and application of spectrum management software tool SEAMCAT;
- Prediction of allowable radio frequency radiation levels due to human exposure limits;
- Analysis of heterogeneous networks (HetNets) for capacity offloading to small cells;
- MIMO antenna analysis in various environments in terms of multiplexing, diversity and beamforming performance, LTE MIMO applications for high-speed train scenarios;
- IoT measurements and channel predictions for low-powered device networks;
- Design and fabrication of radio frequency and embedded microprocessor systems;
- Antenna measurements in anechoic chamber.



Meet our team

Assoc. Prof. Dr. **Kęstutis Svirskas**, Group leader, expert in radio wave propagation, electromagnetic compatibility, RF effects to organic cells, computer networks.

Assoc. Prof. Dr. **Vytautas Jonkus**, Senior researcher, expert in electronics, embedded systems, mobile networks, and electrodynamics.

Assoc. Prof. Dr. **Rimvydas Aleksiejūnas**, Researcher, expert

in radio wave propagation, channel modelling, microwave theory, MIMO antennas, LTE physical layer.

Assoc. Prof. Dr. **Mindaugas Žilinskas**, Researcher, expert in radio wave propagation, microwave theory, MIMO antennas, LTE physical layer, and electromagnetic compatibility.

PhD students: **Jevgenij Krivočiža**, **Jurgis Aleksandričius**, **Albert Cesiul**, **Gediminas Žukauskas**.



Research outcomes

Investigation of electromagnetic compatibility between LTE, radars, DECT, DVB-T and MDTV systems in collaboration with State Radio Regulatory Authority.

The group has designed radiocommunication system for nano satellites in NanoThrust project.

Our partners are Huawei Lithuania Ltd., Omnitel Ltd., University of Luxembourg, Wireless Communications Laboratory (WiLab) at University of Bologna, French National Frequency Agency (AFNR), French Graduate School in Electrical Engineering, Computer Science and Telecommunications (ENSEA), Lithuanian Radio Regulatory Authority, NanoAvionics Ltd., Wilibox.



Resources

Our laboratory is equipped with fully functional Huawei LTE DBS 3900 800/1800 MHz base station, core network infrastructure, such as modems, switches, routers and measurement equipment. It allows us to perform communication system load tests with controllable conditions to estimate network capacity under various equipment configurations and different environment conditions. We also use software de-

fined radio modules USRP from Ettus Research for MIMO channel measurements and interference analysis between different radio technologies. For numerical modelling we use Tecal E6000 Blade Server with virtualized Linux environment allowing us to run simulations in parallel. For running simulations and sharing results, we use Jupyter Notebook environment enabling quick and easy server resource access via web browser interface.



Contacts

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