Family name (surname): Mikhaylov
First (given) names: Konstantin
Date and place of birth: 23.07.1985, Leningrad, USSR
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Education and degrees:

2006: Bachelor in Electric Engineering with the focus in radio engineering from Saint-Petersburg State Polytechnical University, Russia *(average grade 4.2/5).*

2008: Master of Science in Electric Engineering with the focus in radio systems from Saint-Petersburg State Polytechnical University, Russia *(average grade 4.9/5).*

Currently (since 2009): part-time PhD (Dr.Sc(Tech)) student in the University of Oulu, Finland *(average grade 4.6/5)*

Completed graduate projects:
B.Sc: *Speech compressing methods*
M.Sc.: *Methods for implementing FLL and PLL systems using FPGAs*

Fields of expertise: I have 8-year experience for conducting research and development in the field of energy efficient and short-range wireless communications (e.g., IEEE 802.15.4(a), IEEE 802.11, Bluetooth/Bluetooth Low Energy(Smart), LoRa), low-power embedded and sensing systems and experience of designing and prototyping respective applications. Over the recent years I participated in multiple industrial research and development (R&D) projects working in close cooperation with industrial partner companies (e.g., Nokia Solutions and Networks (NSN), Polar Electro, Tracker,…). In those projects I have evaluated different communication technologies both in hardware and via simulations and designed the product prototypes. Few of the developed devices are currently in different pre-production and production phases in the companies.

Unique skills & knowledge:
1. Networking aspects of the Bluetooth Smart (implemented 1st multihop Bluetooth Smart solution worldwide, proposed few modifications for improving the performance of Bluetooth Smart in multimode environment, developed Bluetooth Smart network simulator)
2. Modular Plug&Play systems (designed the first WSN platform featuring HW module identification)
3. Low power wide area networks – have experience of designing devices and good understanding of capabilities of the recently proposed LoRa technology.

Language proficiency:
- Russian – native;
- English – fluent;
- German – advanced;
- Finnish – basic;

Professional appointments:
Current position:
Timeframe: *January 2014 - ...*
Position: Researcher at Centre of Wireless Communications (CWC), University of Oulu, Oulu, Finland
Responsibilities: I am conducting research and development work in the field of wireless sensor networks and short range wireless communication technologies. My major focus is development and implementation of the novel platform (both hardware and software) for the future WSAN and Internet of Things. I am responsible for a) electric circuit design b) PCB design c)prototype manufacturing d)embedded software design and e)testing and measurements. Also I am contributing to planning and preparing the new research projects and supervising MSc students.

*Previous position**s**:*
Timeframe: *August 2008 **-** December 2013*

Position: researcher for wireless and embedded systems in RFMedia Laboratory, Oulu Southern Institute (University of Oulu)/Centria R&D (Central Ostrobothnia University of Applied Sciences), Ylivieska, Finland

Responsibilities: I planned and conducted applied research and development work in the field of wireless & embedded systems. My main focus was applied research about non-specific short range wireless communication and wireless sensor and actuator networks. Over those years I have designed, prototyped in hardware and tested multiple different applications using various short-range wireless communication technologies (including, but not limiting to IEEE 802.11, IEEE 802.15.4, Bluetooth/Bluetooth Low Energy, proprietary) and different embedded systems (PIC, Atmel and TI microcontrollers and systems-on-chip; DSPs; FPGAs). The applications have been developed for the needs and in close cooperation with different partner companies from the Industry. Several of the developed prototypes are currently in different pre-production and production phases in the companies. As a part of my work I also supervised several BSc students during their internship. Two invention disclosures were made by me for the University of Oulu.

Timeframe: *November 2006 - August 2008*

Position: radio and embedded systems engineer at Federal State Unitary Enterprise Research-and-Production Association "Impulse" (Russian Federal Space Agency), St. Petersburg, Russian Federation

Responsibilities: I have participated in development of ultra-long range adaptive shortwave communication system, being responsible for interfacing radio and a PC. I have designed and developed both the hardware and embedded software.

Professional skills:

I am able to plan and conduct research and development (R&D) work in the fields related to Wireless and Embedded Systems. I have 8-year experience of planning the R&D work, designing, implementing and testing the prototypes of devices based on various embedded processors and radio technologies. I have extensive knowledge of the features of different embedded platforms, the widely used wired (e.g., UART, SPI, I2C, 1-wire, JTAG) and short range wireless (e.g., IEEE 802.15.4, IEEE 802.11, Bluetooth/Bluetooth Low Energy(=Smart),UWB, LoRa) interfaces. I can design a new or adapt an existing wireless communication protocols to the requirements of a particular application. I have extensive knowledge of the capabilities of the different power source options and solutions typically used in low-power applications (mains, primary & secondary batteries, energy harvesting solutions) and have experience of engineering energy-constrained devices and systems. I also have extensive experience of interfacing embedded systems with various peripherals (e.g., sensors, actuators, accelerators, extenders and memory) and experience of designing multi-processor devices. In my work I have mostly used C, C++, Verilog and assembler and worked with:

- ✓ wide range of **microcontrollers** and **systems-on-chip** (STM32F2 (ARM-based), MSP430, CC2430/CC2530, CC1110/CC2510, CC2540, CC430, ATmega1281, PIC18, PIC24 using C and assemblers).
- ✓ **FPGAs** (Altera Cyclone & Stratix FPGA, NI PCI-5640r transceiver using Matlab/Labview or Verilog)
- ✓ **DSPs** (TI 320C20, Elvis Multicore MC24 Processor, using C and assemblers)

Also I have extensive experience of network-level wireless simulations using OMNeT++ & MiXiM simulators (IEEE 802.15.4 & BLE protocols). I am able to plan and conduct experiments, and make measurements using different electronic measurement instrumentation, process and analyze the results. I have sufficient academic publication (first author for >30 publications in the international forums) and research results presentation experience (participated in ten international conferences, for four of those also served as a session chair-person). Also I have supervised two BSc and two MSc students during their internship.

Programming skills:

- **C**: 10 years, extensive experience of developing embedded software applications for different embedded systems (especially - microcontrollers and systems-on-chip) with and without using embedded OSs.
- **C++**: 4 years experience of working with OMNeT++ network simulator and its extensions & developing PC applications.

- **Java**: basic knowledge – implemented the user interfaces for WSAN terminals & data management applications
- **MATLAB** (& **Simulink**): 3 years experience of developing different data acquisition, analyzing and processing applications.
- **LabVIEW**: 1 year experience of designing applications for NI PCI-5640r.
- **Verilog**: 1 year experience of designing the applications for Altera FPGAs.
- **Pascal/Delphi**: 3 years experience of developing data processing applications
- **Javascript & HTML**: 1 year experience of web-development.
- **Assembly languages**: 1 year experience of developing applications for microcontrollers and DSPs.

Computer skills:
- I worked with PC for 21 years, over those years got experience of computer assembling and maintenance, troubleshooting hardware and software problems, installing and configuring the peripherals, components, drivers and software.
- I worked with PCs both under Windows & Linux and have used virtual machines.
- I worked with Microsoft Office (Word, Excel, PowerPoint, and Visio), OpenOffice and LaTeX tools and different image editing software.
- I have sufficient knowledge of the following CAD and IDE systems: Eagle PCB, Eclipse, TI CCS, EWB, Microcap, OrCad, PCad, AutoCad, MathCad, MatLab, LabVIEW, Quartus, IAR 8051/MSP430 IDE, AVR studio, MPLAB, SL IDE

Professional associations' membership:
- ✓ member of Institute of Electrical and Electronics Engineers (IEEE);
- ✓ member of International Association of Engineers (IAENG).

Awards & achievements:
- Received 5000 EUR Nokia Scholarship research grant (2014 & 2015)
- Best paper award at IEEE CogInfoCom'2014 conference

Selected academic publications:
[1] O. Galinina, H. Tabassum, **K. Mikhaylov**, S. Andreev, E. Hossain and Y. Koucheryavy "On Feasibility of 5G-Grade Dedicated RF Charging Technology for Wireless-Powered Wearables", to appear in IEEE Wireless Communications.

[2] **K. Mikhaylov**, T. Pitkäaho and J. Tervonen, "Plug-and-play Mechanism for Plain Transducers with Wired Digital Interfaces Attached to Wireless Sensor Network Nodes", International Journal of Sensor Networks (IF=1.386), Vol. 14, No. 1, 2013, pp. 50-63.

[3] **K. Mikhaylov**, N. Plevritakis and J. Tervonen, "Performance Analysis and Comparison of Bluetooth Low Energy with IEEE 802.15.4 and SimpliciTI", Journal of Sensor and Actuator Networks, Vol. 2, No. 3, 2013, pp. 589-613.

[4] **K. Mikhaylov** and T. Hänninen, "Mechanisms for Improving Throughput and Energy Efficiency of Bluetooth Low Energy for Multi Node Environment", Journal of High Speed Networks, Vol. 21, Issue 3, 2015, pp. 165-180.

[5] J. Petäjäjärvi, M. Pettissalo, **K. Mikhaylov**, A. Roivainen and T. Hänninen, "On the Coverage of LPWANs: Range Evaluation and Channel Attenuation Model for LoRa Technology", in Proc. ITST'15, Dec. 2-4 2015, pp. 55-59.

[6] **K. Mikhaylov**, J. Petäjäjärvi, M. Mäkeläinen, A. Paatelma and T. Hänninen, "Extensible Modular Wireless Sensor and Actuator Network and IoT Platform with Plug&Play Module Connection", Proc. 14th ACM/IEEE International Conference on Information Processing in Sensor Networks, Apr. 13-16 2015, pp. 386-387.

Behavioral skills:
- ability to learn;
- analytical and problem solving skills;
- self discipline, punctual, responsible.