



Summary

Drawing from a substantial engineering and research background, my specialization spans **Electronics, Semiconductors, Software Development, Biomedical IoT Devices, Solid State Physics, and Mathematics**. Over the course of 5+ years in the industry, I cultivated a **wide range of technical skills** and engaged in **various stages of the product life cycle** (concept creation, architecture, design, development, validation, and maintenance). Accumulating over a decade of research experience, I honed the abilities of **critical thinking, problem analysis, and the creation of innovative solutions**. I uphold a **structured, meticulous, and rigorous** approach to my work – consistently dedicated to elevating and sustaining **high standards**. I am a **passionate learner**. I enjoy **leading and collaborating** and can work both **independently and jointly** in fast-paced environments. I have **strong communication and interpersonal abilities**. Details at vladimir-vakhter.com

Education Coursework

PhD	Electrical & Computer Engineering	Worcester Polytechnic Institute, US	CGPA: 4.0/4.0	Aug 2022 – Present
MS	Electrical & Computer Engineering	Worcester Polytechnic Institute, US	CGPA: 4.0/4.0	Aug 2019 – May 2021
Specialist (BS/MS)	Electronics & Automation	Ural Federal University, Russia	CGPA: 5.0/5.0	Sep 2010 – Feb 2016

Experience

- Research Assistant @ Worcester Polytechnic Institute, US** **Aug 2021 – Present**
- Mixed-signal integrated circuit design, printed circuit board (PCB) design, embedded programming for biomedical IoT devices.
- Signal Processing Intern @ Analog Devices, US** **May 2023 – Aug 2023**
- Assessment and development of a physical activity (PA) monitoring algorithm bundle for a wrist-worn wearable.
- Research Associate @ Worcester Polytechnic Institute, US** **Jun 2021 – Jul 2022**
- Developed a desktop application for communication with Bluetooth Low Energy (BLE) devices. Coded in C++/Qt.
 - Programmed the STM32WB55xx MCU to control peripheral units and transmit the acquired data via BLE. Coded in C with HAL.
 - Designed a one-time programmable (OTP) memory to store a chip ID. Worked in Cadence Virtuoso with TSMC 180nm CMOS process.
 - Built the read/write logic for the OTP memory and on-the-fly randomness test suite FIPS 140-1. Used Verilog and VHDL.
 - Proposed a threat modeling methodology for resource-restricted wireless biomedical devices.
- Software Engineering Intern @ Cadence Design Systems, US** **May 2020 – Sep 2020**
- Prototyped computational geometry algorithms for design rule checking in PCBs. Coded in C++ and GLSL. Utilized OpenGL API.
- Software Engineer @ Kalinin Machine-Building Factory, Russia** **Sep 2017 – Mar 2019**
- Designed real-time application and communication protocols for networked computers within a multifunctional all-terrain vehicle. Coded in C++/Qt for QNX OS. Used TCP, UDP, NTP, RPC, multithreading, mutexes, timers, and system pulses.
 - Configured and maintained a GitLab server via Docker for version control.
- Electrical Engineer @ Splinx (a subsidiary of IC Realtime), Russia** **May 2016 – Aug 2017**
- Designed component libraries, analog and digital electronic schematics, and PCBs with KiCad EDA and Altium Designer EDA.
 - Developed firmware for microcontrollers. Coded in a mix of C++, Lua, and uPython.
 - Prototyped, debugged, and brought up the designed hardware/PCB assemblies and low-level software.
 - Communicated with suppliers/manufacturing partners, set factory requirements. Released specifications.

Skills

Software Engineering

Programming Languages:	C++ (std, Qt, SystemC), Python, Java, C, Shell, MySQL, MATLAB, Lua, uPython, Asm x51
Version Control:	Git (with both GitHub and GitLab), Bitbucket
CI/CD, Collaboration Tools:	Jenkins, Bamboo, JIRA, ClickUp, Trello
Testing:	Google Test (C++), Junit (Java)
Troubleshooting:	GDB, Valgrind, Clang
Operating Systems:	Linux (Ubuntu, Kali Linux, Fedora), Windows (incl. WSL2), QNX Neutrino
GPU Computing:	OpenGL API, GLSL, GLFW, GLAD
Virtualization Technologies:	Docker, VMware Workstation
Cloud Technologies:	Amazon Web Services – AWS (RDS, S3, API Gateway, Lambda)
Web Development:	React.js, Node.js, Bootstrap, jQuery, REST APIs, Swagger, Google Analytics, Firebase
Machine Learning:	Keras

Electrical & Computer Engineering

Hardware Description Languages:	Verilog/VHDL
FPGAs:	Xilinx Artix A7-100T with Xilinx Vivado IDE
Embedded Programming / MCUs:	STM32WB55xx, STM32F3VCT6, ESP8266, Atmega2566, MSP430, ADuC847
Analog ASICs Design:	Cadence Virtuoso, Mentor Graphics suite (Calibre, ModelSim)
Circuits / Components / PCB Design:	Altium Designer, KiCAD EDA, Cadence Allegro
Waveform Specification / Debugging:	WaveDrom, GTKWave

Instrumentation:	Supplies, generators, VNAs, oscilloscopes, multimeters, soldering stations, microscopes
Simulation/Modeling:	ModelSim, Mathcad, SIMetrix, Micro-Cap
Other	
Additive Manufacturing:	3D Printing (printers: Creality, Ultimaker, and LulzBot; slicers: 3DPrinterOS and Prusa; CAD: Autodesk Fusion 360) and Laser Cutting.
Natural Languages:	English (fluent) and Russian (native)

Publications

Journals

1. [\[Scholar\]](#) [V. Vakhter](#), B. Kahraman, G. Bu, F. Foroozan, and U. Guler "A Prototype Wearable Device for Noninvasive Monitoring of Transcutaneous Oxygen", IEEE TBioCAS, vol.17, no. 2, pp. 323 – 335, Mar. 2, 2023.
2. [\[Scholar\]](#) [V. Vakhter](#), B. Soysal, P. Schaumont, and U. Guler, "Threat Modeling and Risk Analysis for Miniaturized Wireless Biomedical Devices", IEEE Internet of Things, vol. 9, no. 15, pp. 13338-13352, Aug.1, 2022.
3. [\[Scholar\]](#) A. Ishchenko, [V. Vakhter](#), A. Slesarev, V. Yagodin, S. Osipov, K. Lukyashin, V. Shitov, E. Zhevak, V. Osipov, and B. Shulgin, "Thermoexoelectronic and Thermoluminescent Properties of Transparent YAG: Nd and YAG: Yb Nanoceramics", Bulletin of the Russian Academy of Sciences. Physics, vol. 78, no. 9, pp. 921 – 924, 2014.
4. V. Churmanov, S. Zyryanov, A. Ishchenko, F. Neshov, [V. Vakhter](#), E. Zhevak, and D. Ilyin, "Radiation and Thermal Methods of Synthesis of a Luminescent ZnO Coating", Tasks of Spectroscopy and Spectrometry, vol. 30, pp. 54 – 58, 2012.
5. A. Ishchenko, B. Shulgin, O. Teslenko, L. Victorov, [V. Vakhter](#), B. Slobodin, and R. Samigullina, "Luminescence and Scintillation Properties of the CsVO₃ Metavanadate", Tasks of Spectroscopy and Spectrometry, vol. 30, pp. 88 – 95, 2012.
6. R. Samigullina, B. Slobodin, A. Ishchenko, B. Shulgin, L. Victorov, [V. Vakhter](#), and E. Zhevak, "Radioluminescence Properties of Cs Metavanadates", News of Higher Educational Institutions: Physics, vol. 55, no. 11-3, pp. 192 – 193, 2012.
7. F. Neshov, F. Klinov, A. Ishchenko, S. Zvonarev, [V. Vakhter](#), V. Churmanov, S. Zyryanov, and B. Shulgin, "Synthesis of Luminescent Nanostructured Coating from Zinc Oxide", Tasks of Spectroscopy and Spectrometry, vol. 29, pp. 129 – 133, 2011.

Conferences

1. [\[Scholar\]](#) A. Leonardi*, C. Murphy*, S. Hobson*, V. Rohera*, [V. Vakhter*](#), B. Kahraman, G. Bu, F. Foroozan, L. Rhein, and U. Guler, "Optimizing Transcutaneous Oxygen Measurement Sites on Humans", 2023 IEEE Engineering in Medicine and Biology Conference (EMBC), Jul. 24 – 27, 2023, Sydney, Australia, pp.1–4 (* equal contribution).
2. [\[Scholar\]](#) B. Kahraman*, [V. Vakhter*](#), I. Costanzo, G. Bu, F. Foroozan, and U. Guler, "A Miniaturized Prototype for Continuous Noninvasive Transcutaneous Oxygen Monitoring", 2022 IEEE Biomedical Circuits and Systems Conference (BioCAS), Oct. 13-15, 2022, Taipei, Taiwan, pp.486 - 490 (* equal contribution).
3. [\[Scholar\]](#) [V. Vakhter](#), B. Soysal, P. Schaumont, and U. Guler, "Minimum On-the-node Data Security for the Next-generation Miniaturized Wireless Biomedical Devices", 63rd International Midwest Symposium on Circuits and Systems, MWSCAS'20, Aug. 2020, pp. 1068 – 1071.
4. [V. Vakhter](#) and A. Druzhinin, "Multifunctional Magneto-Optical System for Measuring Magnetic Characteristics of Ferromagnets", 2nd International Youth Conference, Physics. Technologies. Innovations. PTI – 2015, April 2015. pp. 87 – 88.
5. [V. Vakhter](#) and A. Druzhinin, "Measurement of the magnetic characteristics of ferromagnetics by a magneto-optical method", 21st All-Russian Scientific Conference of Young Physicists and Scientists, VNKSF-21, March – April 2015. pp. 258 – 259.
6. [V. Vakhter](#) and A. Druzhinin, "Multifunctional Optical Device for Measuring Magnetic Characteristics of Ferromagnets", 20th All-Russian Scientific Conference of Young Physicists and Scientists, VNKSF-20, March – April 2014. pp. 248 – 249.
7. V. Yagodin, E. Zhevak, [V. Vakhter](#), M. Zuev, A. Vasin, A. Ishchenko, and B. Shulgin, "Radioluminescence Properties of Eu Doped Strontium Gadolinium Oxyapatites", 10th Issyk-Kul Conference on Radiation Physics, SCORPh – 2013, July–August 2013, pp. 17–19.
8. [V. Vakhter](#), E. Zhevak, A. Yarkov, A. Ishchenko, L. Victorov, and B. Shulgin, "Composite Organic-and-Inorganic Scintillators Based on Polycrystalline Fluorides", 10th Issyk-Kul Conference on Radiation Physics, SCORPh – 2013, July – August 2013. pp. 94 – 95.
9. [V. Vakhter](#), A. Ishchenko, A.Slesarev, and S. Osipov, "Thermoexoelectronic Emission and Thermally Stimulated Luminescence of the Transparent YAG:Nd³⁺ and YAG:Yb³⁺ Nanoceramics", 14th All-Russian School-Seminar on the Problems of the Condensed Matter Physics, SPFKS-14, November 2013. p. 250.
10. R. Samigullina, B. Slobodin, A. Ishchenko, B. Shulgin, L. Victorov, [V. Vakhter](#), and E. Zhevak, "Radioluminescence Properties of Cs Metavanadates", 3rd International Congress on Radiation Physics and Chemistry of Condensed Matter, High Current Electronics and Modification of Materials with Particle Beams and Plasma Flows, September 2012. pp. 132 – 133.
11. A. Ishchenko, [V. Vakhter](#), E. Zhevak, V. Churmanov, and S. Zyryanov, "Nano Zinc Oxide Scintillation Coating", International Scientific Youth Symposium "Biosphere's safety – 2012", May 2012. pp. 71 – 72.