

Sergey Bashkirov

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Summary

Application software engineer with R&D experience in software and firmware development for scientific devices with active open source community participation is seeking for a full time position in application development. Experienced in Atomic Force Microscopy, semiconductor Kelvin probe analysis, Raman TERS imaging, electrochemistry, actuators control. I enjoy prototyping and problem solving process, adhere DP principle: don't choose one guess - try them all.

Areas of expertise

Programming: Crossplatform, embedded programming, realtime algorithms, RTOS, embedded scripting, 2d/3d visualization

AFM: Contact, semicontact, Kelvin probe, MFM, PFM

Math: 2d/3d geometry, computer vision, machine learning, statistics, image processing

Raman: Confocal Raman, coupled mapping, TERS imaging

Personal achievements

- Created from scratch software for controlling Atomic Force Microscope.
- Reduced AFM modes development time and eased prototyping by implementing scriptable GUI builder and hardware embedded real time scripting language.
- Reduced hardware design time by making expandable stackable PCB solutions consisting of identical PCBs. Made it for pneumatics control and stepper motors control.
- Simplified "find the same place" task for AFM after sample reinstallation by making video aligning and navigation by video mode.
- Reorganaized production and supplies purchase processes by performing statistical predictive contracts analysis. Made business control software for warehouse keeping, product assembling, purchasing and contracts tracking.
- Acheived high precision with equipment made of low cost components by applying machine learning techniques to calibration process.

Technical proficiencies

Programming: C, C++, Java, microcontroller assembler

Platforms: Linux, Windows, ChibiOs, FreeRTOS

Frameworks: Qt, Boost, Swing, WxWidgets

Microcontroller series: ST Cortex-M; Atmel AVR8; Analog Devices Shark DSP, NXP ARM7TDMI

Visualization: Widgets design, Spatial, 3D geometry, 2D/3D visualization

Scripting: Lua, Ruby, Python, Maxima, SQL, R, Shell scripting

Web technologies: Ruby-on-rails4, Javascript, Bootstrap

Various: PCB design, Spice simulation, hardware debugging, mature soldering skill

Prototyping: Capable to rapidly prototype electromechanical software and/or firmware controlled solutions

Math: Computer vision, Kalman filtering, machine learning, statistics, data, image processing

Most recent work experience

Aist-NT Inc.

Software Engineer

AFM software development, firmware development, image processing, AFM modes design, AFM-Raman coupling, actuators control, data acquisition and processing, production control

Novato, CA

Transmag

Contract

USB based BLDC motor controller's interface development. Designed firmware, user interface, suggested proper USB schematics.

Santa Rosa, CA

NT-Mdt

Software engineer

Scanning probe microscope and auxiliary devices programming. Designing drivers, firmware, user interface, algorithms.

Moscow, Russia

Education

Moscow Institute of Physics and Technology

Master of Science in Applied Mathematics and Physics

Moscow, Russia

- **Most recent courses taken:** Circuits & Electronics, Machine learning, Autonomous navigation, Kalman filtering, SAAS, Statistics with R, Node.JS, Angular.JS, Booststrap, JavaScript.

Open source projects participation

grambo-pi.com: Created expandable stackable PCBs set for RaspberryPi computer for robot prototyping.

xonotic.org: Created Blend2map Blender3D to MAP exporter.

chibios.org: Submitted I2C slave mode driver, IWDG driver.

QtLua: Provided a patch making Object::connect() work in the same way as in Qt.

Gaw: Provided a patch fixing crashes with default configuration file for gaw waveform viewer.