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; experienced in GUI design, hardware to computer communication, firmware, RTOS, real time applications, motors control, pneumatics regulation, Atomic Force Microscopy, semiconductor Kelvin probe analysis, Raman TERS imaging, electrochemistry, actuators control; have experience in algorithms design, data acquisition and processing, computer vision, machine learning; rapid prorotyping and electrical debugging; good project management abilities, problem solving R&D experience.

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 pheumatics 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 perforing statistical predictive contracts analysis. Made business control software for warehouse keeping, product assembling, purchasing and contracts tracking.
- Achieved 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, Altera FPGA, CPLD
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: Hardware interfaces (I2C, SPI, USART, JTAG, TWI, SMBus), PCB design, Spice, electrical debugging, 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. **Novato, CA**
Software Engineer
AFM software development, firmware development, image processing, AFM modes design, AFM-Raman coupling, actuators control, data acquisition and processing, production control

Transmag **Santa Rosa, CA**
Contract
USB based BLDC motor controller's interface development. Designed firmware, user interface, suggested proper USB schematics.

NT-Mdt **Moscow, Russia**
Software engineer
Scanning probe microscope and auxilary devices programming. Designing drivers, firmware, user interface, algorithms.

Education

Moscow Institute of Physics and Technology **Moscow, Russia**
Master of Science in Applied Mathematics and Physics

- **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.