Dmitry Khavulya

Firmware Engineer - Orbcomm, Department of Embedded Systems

Tabernacle, NJ - Email me on Indeed: indeed.com/r/Dmitry-Khavulya/1367176acac2d31e

Energetic and enthusiastic engineer with a focus on embedded systems and digital signal processing (DSP). Over 5 years of professional experience in hardware and software development across multiple industries including Satellite M2M, defense and medical device. Adept at solving complex problems and quickly defining practical solutions. Skilled at rapid prototype development. Strong innovation, research & analytic abilities.

Areas of expertise include:
♦ Critical Software ♦µProcessor Architecture ♦ M2M
♦ C/C++ ♦Analog and Digital Electronics ♦ Wireless
♦ RTOS ♦DSP ♦ Satcom
Willing to relocate: Anywhere
Authorized to work in the US for any employer

WORK EXPERIENCE

Firmware Engineer

Orbcomm, Department of Embedded Systems - Rochelle Park, NJ - August 2014 to Present

Responsibilities
o Project management:
* Instrumental in strengthening Orbcomm's OEM relationship with Carrier by spearheading the on-time design and delivery of features essential for successful field trial launches in North America and Europe
* Design and write GSM protocol specifications for advanced communications between telematics devices and Web applications
* Supervise development of PC engineering tools to support data extraction and automated file management
* Coordinate engineering team for software integration and manage software release for production
* Review Protocols submitted by strategic client partner (Carrier Engineering) and advise Orbcomm IT on front-end development
o Software Development:
* Develop C/C++ software for ARM9 based telematics devices
* Create features for advanced Over the Air (OTA) functionality using Satellite & GSM networks for the Carrier Transicold OEM program; features include remote firmware upgrades, data downloads & configuration management
* Integrate client M2M protocols into Orbcomm telematics products allowing 2-way serial communications between client microcontrollers and Orbcomm telematics products
* Define methodology for sending commands over ORBCOMM OG1 and OG2 low orbit satellite network
* Build software to integrate new Skywave IDP modem into existing telematics product line to allow M2M communications over the Inmarsat network
* Design and implemented a multithreaded PC based simulator to mimic a multi-processor control system to assist in validating telematics devices.
* Identify and address inefficiencies in established alarm handling procedures.

Embedded Systems Engineer

General Dynamics Land Systems - Sterling Heights, MI - March 2014 to June 2014

Designed and developed CAN/SCI supported BOOTLOADER prototype for MC9S12 family of processors in C and CPU 12 assembly. Setup a test environment for testing BOOTLOADER CAN and Serial functionality.
• Key Responsibilities:
◦ Software Development:
* Developed interrupt driven CAN BOOTLOADER software to support application software downloads via CAN or SCI interface
* Development software in a Linux environment
* Developed a RAM executable FLASHLOADER C module for writing application program data to FLASH
* Developed j1939 Data Link layer specific CAN driver
* Implemented a Data Link layer transport protocol as defined in J1939-21 for sending ASCII SRecord data over the CAN bus
* Developed a module for converting SRecord ASCII data to binary data
* Implemented serial protocol for sending SRecord data over SCI interface
* Wrote test DOWNLOADER software using CAPL and CANalyzer
◦ Documentation:
* Defined software requirements specifications for BOOTLOADER software
* Defined interface requirements specifications for performing software downloads via CAN and RS-232 interfaces
* Developed state machine diagrams

Embedded Systems Engineer

Abbott Laboratories - Princeton, NJ - January 2013 to January 2014

Developed a new software based method for performing thermal calibration of blood analyzers resulting in a calibration accuracy increase, heating precision improvement, excess hardware reduction, and component testing simplification. Presented prototype design specifications to R&D for buy-in and adoption by the production team.
• Key Responsibilities:
◦ Software development:
* Developed C/C++ embedded software on ARM cortex M3 processor to perform thermal calibration on I-STAT blood analyzers
* Designed and implemented PID based thermal control algorithms
* Developed Serial communication protocol between I-STAT analyzers and Kiethley 2700 Digital Multimeter over RS-232 interface
* Used uCOS III to implement a multitask design for enhancing communication synchronization between multiple thermal sensors, actuators, and external hardware components in C/C++
* Developed software to automate thermal calibration testing and perform statistical analysis on test data
* Designed, developed and implemented prototype menu-driven thermal calibration and verification software to address calibration error in current method
◦ Documentation:
* Defined thermal calibration software requirements
* Wrote thermal calibration unit test plans
* Wrote thermal calibration software design documents
◦ Software validation: Project lead for in-house custom calibration software validation; project lead for off-the-shelf software validation
◦ System testing: Wrote protocols for thermal calibration testing; perform statistical analysis on test data

Research Engineer

UMDNJ, Department of Pathology and Laboratory Medicine - Piscataway, NJ - September 2011 to December 2012

Built devices to measure mechanical properties of biomaterials using IR sensors and signal processing techniques. Design included mechanical oscillators and infrared sensors. Implemented Fast Fourier Transform (FFT) algorithm to convert vibrational data to elastic moduli. This device provides a non-destructive real-time method to evaluate the mechanical properties of implantable medical devices prior to surgery.

• Key Responsibilities:

◦ Hardware development:

* Designed and developed NEAR INFRARED (NIR) optical sensor to measure displacement of collagen samples during self sustained vibration

* Designed and developed mechanical oscillator to vibrate collagen samples at specified frequencies

◦ Software development:

• Developed MATLAB software to enable communication between optical sensor, mechanical oscillator and PC via Measurement Computing DAQ (USB-1208FS)

• Designed data acquisition and signal processing algorithms using MATLAB

• Wrote MATLAB software to automate dynamic mechanical testing on allograft samples: testing included harmonic and impulse excitation analysis

• Implemented MATLAB FFT and line fitting algorithms to extract elastic mechanical properties from test data

• Used ANSYS to model dynamic mechanical properties of collagen

• Developed image processing algorithms for identifying cellular debris in allograft histology using MATLAB

Research Engineer

Rutgers University - New Brunswick, NJ - July 2010 to June 2012

Biomedical, and Drug Delivery Devices Lab, New Brunswick, NJ July 2010 - June 2012

Built an auditory evoked potential sensor and integrate sensor with brain oximetry device to evaluate brain auditory functions during hypoxic and eschemic events. Built infrared pulse sensors for vascular stiffness estimation

• Key Responsibilities:

◦ Hardware development:

* Designed and built an EEG channel for non-invasive monitoring of electrical activity in the brain stem

* Integrated EEG channel with a brain oximetry device.

◦ Software development and signal processing:

* Developed LabVIEW software for data acquisition using Measurement Computing DAQ (USB-1408FS)

* Developed and implemented signal processing techniques including, ensemble averaging, discrete wavelet decomposition, and digital filtering, to extract Brainstem Auditory Evoked Potentials (BAEP) from EEGs using MATLAB

◦ Additional responsibilities:

* Designed experiments that utilized this device in evaluating brain stem functions under normal and abnormal breathing conditions.

* Supervised 9 senior design students; mentor and train junior lab members

* Teacher's Assistant (TA) for bioinstrumentation course

EDUCATION

M.S. in Biomedical Engineering

Rutgers University, School of Engineering
May 2012

B.S. in Biomedical Engineering

Rutgers University, School of Engineering
May 2010

SKILLS

ARM (5 years), C/C++ (5 years), Linux (5 years), MC9S12 (5 years), MATLAB (5 years), CANalyzer, LabVIEW (5 years), IR Sensors (5 years), Unix (5 years), RTOS (5 years), POSIX (5 years)

PUBLICATIONS

ZnO nanostructure-modified QCM for dynamic monitoring of cell adhesion and proliferation

2012

ZnO nanostructure-modified QCM for dynamic monitoring of cell adhesion and proliferation, Biosensors and Bioelectronics, 2012

Rapid monitoring of brain auditory evoked potentials in spontaneous cerebral hypoxi

2012

Rapid monitoring of brain auditory evoked potentials in spontaneous cerebral hypoxia, Bioengineering Conference (NEBEC), 2012 38th Annual Northeast

ADDITIONAL INFORMATION

SKILLS

Languages: C/C++, MATLAB, LabVIEW, Java, ARM assembly, CPU 12 assembly
OS: Windows, Mac OS X, Unix, Linux, uCOS-III, FreeRTOS
Hardware: ARM, MC9S12, ATMEL, IR Sensors, Thermal circuits, Analog and Digital electronics, JTAG, Kiethley 2700, MCC […] DAQ
Interfaces and communication protocols: CAN, SCI, SPI, USB, TCP/IP
Signal Processing: Data Acquisition, Spectral Analysis, Fourier Transform, Digital Filter Design, Wavelets, Principal Component Analysis
Tools: IAR, Abacus, ANSYS, Cosmic tools, CANalyzer