J. Whitaker McRae

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Summary

I am a lifelong technology enthusiast who has worked in many areas of embedded and systems software development and testing. Results driven and self taught in many aspects, I excel at programming real-time software from the firmware up to the application level, with a special love for C++.

Education / Qualifications

Bachelor of Science in Aerospace Engineering, 2009
Bachelor of Science in Mechanical Engineering, 2009
University of Florida, Gainesville, Florida
Minor: Business Administration
Honors: UF Honor's Program
National Society of Collegiate Scholars, 2003
Golden Key International Honor Society, 2004

International Baccalaureate Diploma, 2003
Stanton College Preparatory, Jacksonville, Florida
Honors: National Honor Society

Technical Expertise

Development

- Real-time development in C/C++ (Eclipse, gcc), and using UML modeling (Rational Rhapsody)
- Distributed system framework development using Python 3 with REST + MQTT
- Shell scripting (bash), Makefile and Dockerfile creation, RegEx knowledge
- Android application development for AOSP, Google Play (Android Studio, Eclipse + ADT)
- GUI and tool development experience in GTK+3 (Python, C++), Java (Eclipse)
- Basic web development using HTML, Javascript (including ReactJS), and CSS
- Database programming using InfluxDB (time series), SQLite, MySQL (relational)
- Familiar with IBM Rational DOORS, Atlassian JIRA, Git, Subversion, ClearCase, Borland StarTeam

Testing

- Requirements driven continuous regression testing using automated script suites in Python and VB
- Regulation driven testing and formal product/device certification in both healthcare and aviation industries
- Feature driven continuous regression testing using Jenkins + PyTest + RPi/Arduino + custom robotics
- Creation of automated script and manual procedure tests for formal FDA and FAA certifications
- Familiar with DO-178B certification of safety critical systems used on large scale passenger jets

Experience

SYSTEM ARCHITECT + LEAD ENGINEER, GOOEE TEST LAB, 2016-present
Gooee, St Petersburg, Florida
Reference: Krzysztof Mlodozeniec, Software Engineer. (*contact info upon request*)

- Architected cloud based automated wireless bluetooth mesh test facility (https://gooee.com/test-lab)
  - Jenkins + PyTest based automation of control and data gathering scripts, regression tests, latency tests, etc
  - Design and integration into Balena + Docker deployed RPi nodes (BLE sniffing, FW flashing, RTT I/O, etc)
  - Design and integration into Environment logging devices, LED alert devices, Touchscreen control devices
  - Integration into line following robots with upward facing sensor array, servo controlled button pressers
- Designed data analytics reporting system using local + cloud InfluxDB instances for cached raw + processed data

- Data reporting from distributed devices of BLE packet sniffing and decomposition
- Data reporting from distributed devices of Vout + DALI bus devices (lighting control), SEGGER RTT interface
- Command and analysis of local data via complex system tests executed throughout bluetooth mesh
- Data read + visual analysis of statistics via Grafana, available in real-time to engineers across 3 continents

- Assistance with design and deployment of satellite and partner company test operations
  - Helped to architect and deploy IoT test lab for Gooee partner Aurora Lighting (Swindon, England)
  - Deployment of modular components to smaller Gooee test facility for build sanity (London, England)

SENIOR SOFTWARE ENGINEER + AVIONICS GROUP LEAD, 2015-2016
TRU Simulation + Training, Lutz, Florida
Reference: Tom Beers, Software Lead. (813) 480-2813

- Lead Software Engineer on Bell 505 and Bell 412 Level 7 certified Flight Training Devices
  - Responsible for team of software engineers, simulator architecture, build system, and FAA certification
  - Led full lifecycle from requirement creation with Bell through FAA (and EASA) FTD Level 7 certification
  - Used both simulated and stimulated avionics suites, developed all C/C++ nav and flight instrument models
  - Integrated all I/O (ARINC-429, RS-232, ethernet, and CAN bus), motions and vibrations platforms
  - Assisted in integrating newly developed Bell COPTER model (static library + API header) for flight dynamics
- Developed and Integrated Garmin G1000H suite for the initial Bell 505 Flight Training Device
  - Stimulated Garmin 1040 Display Units over ARINC-429 and Garmin's proprietary HSDB protocol
  - Updated Garmin Integrated Avionics (GIA) simulation in C++ to support multiple modular LRUs
  - Oversaw architecture updates to support Garmin G3000 and G5000 suites with portable C++ LRU models

SENIOR PROJECT ENGINEER, 2012-2015
Performance Software, Clearwater, Florida
Reference: Michael Johnson, Site Lead. (623) 337-8240

- Developed Patient UI app for Sonosite's iViz ultrasound tablet, running on top of AOSP (Android) framework
  - Wrote requirements from initial customer wire frame drawings, scoped work effort and man hours
  - Coded/Integrated Patient UI app into existing Scan UI framework (Android NDK)
  - Assisted with Content Provider service effort to interface with major medical databases using MySQL
- Subsystem lead for Collimator system firmware development in on GE Healthcare's Revolution CT device
  - Wrote requirements, scoped work efforts and man hours, developed test plan, led team to execute plan
  - Coded/Integrated VxWorks C driver updates for modified FPGA register map, new register functionality
  - Coded/Integrated VxWorks C++ application updates using Rational Rhapsody model driven development
  - Led verification effort using Python script and test framework developed alongside firmware updates
- Developed Python test script sets for Axial Rotation system on GE Healthcare's Revolution CT device
  - Wrote core Python test libraries to integrated with C/C++ firmware running on a VxWorks control board
  - Scripted ~40 individual tests to be used in FDA 510(k) premarket verification

AVIONICS & DATA LINK ENGINEER, 2009-2012
CAE USA Military Simulation and Training, Tampa, Florida
Reference: Bahram Abgoon, Avionics Group Lead. (813) 887-1605

- Developed C++ Hawklink Radio Terminal Set to be used on all Navy MH-60R Romeo mission simulators
  - Coded/Integrated Air-side RTS module to link with AOP (Mission Computer) via MIL-STD-1553
  - Coded/Integrated Ship-side RTS module to simulate Momship data link Command / Control
  - Fully functional link with real deployed Navy fleet (acting as Momship) via military HLA Network
- Developed C++ Communications Management Unit (ATC data link) to be used on all capable mission simulators
  - Coded/Integrated Williamsburg Protocol + ARINC 619 + ARINC 702 link to Flight Mission Computer
  - Coded/Integrated ARINC 739 link to MCDU, ARINC 740 link to Cockpit Printer for ACARS control
  - Support for near full ACARS, FANS 1/A, AFN, and CPDLC functionality via simulated C/C++ ground station
- Spearheaded development of AT-6 Flight Mission Computer and Link 16 synthetic environment (SADL)
  - Developed interface to link C/C++ simulation code with C# models for Display Unit and MCDU graphics
  - Coded/Integrated C/C++ Flight Mission Computer DAFIF database control and flight planning capability
  - Synced with CGF synthetic environment for Link 16 entities, Command / Control of Link 16 network data
- Helped develop and maintain CAE NavServer (real-time database + server/client) for global radio navaids
  - Import/control of Jeppesen/DAFIF worldwide radio data as Microsoft Access database via ODBC
  - Connection to C/C++ host client for on demand Nav Radio tuning, IOS client for command/control/display