Matthew A. Bennett

Software Engineer, Certified Scrum Master, Active Secret Clearance

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Objective: To keep my technical edge, continuously learn new technologies and grow leadership skills as Senior/Principal Engineer, while working on projects of significance and public worth.

Sr. SW Engineer II at Raytheon Space and Airborne Systems. Sep 2014 – Present

F-35 EODAS Program

Product owner and technical contributor responsible for adapting 86k lines of code from ADA to C++. Introduced a custom transpiler, using the theory of compilers and a parser / generator approach based on FLEX/BISON and tree-to-tree translation with recursive-descent parsing. The project was completed in six months instead of eighteen given prior estimate, saving a year.

JSTARS Recap Programs: JBRR, Battle Management Command and Control (BMC2), Mode Development Kit (MDK), for JSTARS Recap Raytheon Radar Risk Reduction (JR4)

Acted as Certified Scrum Master and individual technical contributor on a team of 6-12 (fluctuating) software and systems engineers. Worked on a team through risk reduction and contract phases to deliver a next-generation capability to a government customer.

Domains: Radar simulation, sensor/C2 integration, Web services, Message oriented middleware, modeling and simulation software design and implementation, computational geometry algorithms, real time scheduling algorithms.

Technologies: Java, Spring, Maven, JEE, Junit/powermock/Cobertura/Concordian, Jenkins, SonarQube, ActiveMQ, git, NASA Worldwind, ProGuard, protobuf, XSLT/XPath/XQuery, API and SDK/MDK design/implementation, Eclipse/RCP, C++11/C++14, Boost, POCO, Remote Direct Memory Access (RDMA) via Infiniband.

Software tech lead and architect of Raytheon's Mode Development Kit (MDK) framework, which is an Eclipse-based IDE supporting C++ and MATLAB programming and simulation of radar systems provided to both 3rd-party and internal researchers and developers.

Designer and primary author of a radar emulator (96k lines of java including STAT) used as a stand-in for testing other systems within battle management command and control (BMC2) and Radar-OMS-adapter before the real system was available. Significant contributor to Raytheon's BMC2/ROA suite and maintainer of Jenkins / Maven/-NAR / Nexus build system for 72 related

software repositories totaling ~200k LOC Java (1.8) and C++ 11, and comprising 12 SOA/JMS microservices.

Live customer demonstration support and Camtasia software product demo experience.. Scrum development framework, including scrum master role on two teams. Requirements writing and requirements analysis, software design documents, system of systems design documents. Supported Innovation through Diversity, and 3d prototyping / printing innovation laboratory. Supported the needs of multiple teams in a competition sensitive (firewalled) environment.

Sr. SW Engineer at Raytheon Integrated Defense Systems. Mar 2011 – Aug 2014

Raytheon Clear View™ Border and International Pursuits, Perimeter Intrusion and Detection System (PIDS), Customs and Border Patrol Integrated Fixed Towers pursuit (CBP-IFT), Jordan Border Security Program (JBSP)

Performed as software and systems integrator for marketing and selling efforts and proposal efforts involving Command and Control (C4ISR) Systems and Modeling and Simulation (M&S) software products. Developed and supported software products at all phases in the software life cycle, from Requirements Analysis in the proposal phase through Software Replacement and Evolution. Specific technologies used: C#, C++11, JBoss, JavaEE/JAX-WS, Eclipse/RCP, ESRI ArcGIS, OpenMap, MATLAB, VLC/FFMPEG, JSON, JAXB, PostgresQL, mySQL, SolarWinds, Hyperic/Sigar, PCap, PThreads, Embedded Linux, Jenkins, Maven, gradle/Groovy, Subversion, Ant.

Supported technical demonstrations to international customers and state and national government officials. Contributed to projects of national visibility and significance in the domain of homeland security. Integrated sensors and the Raytheon Multiple Hypothesis tracker (RMHT) with the Clear View product line of Raytheon C2 systems.

Traveled extensively to customer sites to perform software work, assess problems in situ, assure company mission success, and preserve strong company reputation at the four New York City Airports, including demonstrations and requirements meetings with the Port Authority of NYNJ.

Raytheon IED Defeat R&D Enterprise Campaign (EC)

Performed integration and evaluation of many sensor modalities at all technical readiness levels (TRL3-TRL9), including cameras, FM/CW radar, LIDAR, GMTI radar, microphonic, video trackers, video motion detection, video analytics, seismic, thermal imaging, IMS spectrometers, magnetometers, and some cutting-edge active research sensor modalities like capacitive.

Worked as engineering liaison alongside Raytheon partner R&D startups / small companies to develop new sensors around COTS embedded platforms such as Propeller, AVR, RaspberryPi, mbed, android, PIC32, and TI DSP SOIC. Performed extra-disciplinary roles such as circuit assembly and debugging, SPICE, root cause analysis, IV&V, functional and statistical analysis.

Acted as software team lead for Raytheon's next generation IED defeat campaign and supporting the 2014 Boston Marathon, in live support of the FBI, SWAT, Massachusetts State Police, township police, during both the Boston Marathon and Holyoke MA St Patrick's day events.

SW Engineer II at Raytheon Network Centric Systems May 2008 – Mar 2011

Raytheon Emerging Technology pursuits, Raytheon Homeland Security pursuits, Raytheon Secure View IRAD, Raytheon Virtual World Simulation environment

Developed simulations of radar, camera, and other sensor systems along with driver development, middleware, and configuration tooling supporting the actual sensor systems, mostly in JavaEE. Worked on the Sensor Common Offering (API and framework) and Sensor-terrain analysis tool (STAT), a tool used to provide line-of-sight and radio viewshed maps using digital terrain elevation data and modeling / simulation similar to ray tracing.

Developed whole-system optimization models using principles of systems dynamics, agent-based simulation, discrete event simulation, genetic algorithms, design-of-experiments, and monte-carlo; using the tools iSight, exTendSim, Matlab, java applets, AnyLogic. Developed application software, Windows/Linux drivers for custom embedded platforms including Radar and early Wearable eInk display in 2008-09.

Worked on a team of geographically diverse members to develop from the ground up what is now Raytheon ClearView Command and Control Software based on Open Architectures and SOA framework, through tens of sprints to a full-fledged commercial product. Supported public safety system demonstrations / live partnership exercises at major national sporting events and political events (e.g. 2011 Super Bowl in Dallas, 2013 Super Bowl in New Orleans, city marathons, 2012 DNC in Charlotte) through the development and deployment of software, as well as modeling and simulation (for example, what-if analysis, mission simulation).

Computer Science Research Assistant at University of Southern Mississippi

EvacSim, National Center for Spectator Sport Safety and Security (NCS4) May 2006 – Apr 2008

Lead software developer on the EvacSim software product (now SportEvac) for crowd modeling, visualization, training, and evacuation route planning of major events in stadiums and similar large venues. The product has been further developed by The National Center for Spectator Sports Safety and Security (http://NCS4.com), but an older March 2008 snapshot is at https://github.com/twinbee/evacSim. This product was developed under the Southeast Regional Initiative (SERI) under DHS funding, and achieved the highest rank of all the products in this initiative. Led a "surgical" team of four developers in meeting schedule and requirements outlined by DHS. Technologies include C++, OpenGL, SVN, Sketchup, physics with PhysX and Open Dynamics Engine (ODE), Octree and Binary Space Partitioning (BSPs), crowd modeling, behavioral modeling (steering and flocking), agent-based simulation, explosion models.

Conducted research in parallelization, computational geometry, steering and flocking agent based simulation, physical and behavior modeling.

Education

University of Southern Mississippi. Master of Science: Computer Science. 3.81. 2005 – 2007

Activities and Societies: Association for Computing Machinery (ACM), IEEE Computer Society, Society of Physics Students, Math Lab and private math tutoring, WUSM campus radio DJ

"All but dissertation" on PhD program. Left to pursue industry experience in 2008.

Won the University Programming Competition in 2006 with our project, Humane Assembly Language Toolkit (https://www.github.com/twinbee/halt)

Big Data paper accepted and presented at The International Multi-Symposiums on Computer and Computational Sciences, IMSCCS06 in Hangzhou (https://www.github.com/twinbee/hits)

As a graduate team lead, led Southern Miss to win in the Bearing Point Southeast Regional University Programming competition in 2008.

University of Southern Mississippi. Bachelor of Science: Double Major in Mathematics and Computer Science. GPA: 3.89. 2001-2005.

NASA Space grant fellowship recipient. Project: 3d-visualization of scientific data sets in the OpenGL/CAVE including thin film coating models from the school of Polymer Science. Danny Carter scholarship recipient. Transcripts available on request.

Hobbies

I am passionate about continuous learning by doing and tinkering. In the last two years, I have built embedded systems with Arduino and Raspberry Pi, including custom circuit boards to control a toaster oven and monitor/control my garage door. I have earned a general class ham radio license (KG5JYT). I want to contribute to Open Source technology and learn the latest and most cutting edge software tools so that I can use them to make the world a better place. For more of my non-professional hobbies see my GitHub page at https://www.github.com/twinbee/ . In 2019, I have tried out Angular, explored data visualization in python, and made an Alexa skill with AWS Lambda. I also enjoy cycling, canoeing, and hiking long distances at a leisurely pace.

References

John L. Satterfield, Technical peer at Raytheon SAS, 2017

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Bryan Ishman , Senior Developer at Raytheon SAS, 2017

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Bartel Danjul, Principal Developer / Architect at Raytheon SAS, 2017

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More references available upon request