Mark V. Zieg

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Summary of Qualifications

* 30 years demonstrated track record of successful projects and product deliveries
* Domain expertise spanning aerospace (NASA, LM, GD), electro-optics (Wasatch Photonics, Ocean Optics) and online (Amazon, Tribune)
* Equally comfortable as team lead or individual contributor

Technical Skills

**Languages:** C/C++, C#, Python, Java, Perl, Swift, Kotlin, TCL, LabVIEW, Delphi, R, MATLAB, SQL, others

**Platforms:** Linux, UNIX, Windows, Android, iOS, MacOS X, VxWorks, FreeRTOS, others

**Data:** JSON, XML, XSLT, HTML, SOAP, IDL, others

**Frameworks:** STL, .NET, Xamarin, Telerik, J2EE, Boost, Eclipse, NetBeans, Cocoa, SoSCOE, ACE, others

**Embedded:** ARM, Ångström, Raspbian, RSLogix, Windows Embedded, BitBake, OpenEmbedded, others

**Cloud:** AWS (S3, EC2, DynamoDB), REST, JMS, Coral, AMP Pub/Sub, XML-RPC, others

**Comms:** libusb, WinUSB, BLE, SPI, I²C, CIP, Ethernet/IP, RS-232, Ethernet, others

**Databases:** DynamoDB, RDS, Oracle, MySQL, SQL Server, Sybase, DB2, PostgreSQL, SQLite, BDB, Xindice, Informix, others

**Middleware:** CORBA, Apache, jBoss, Tomcat, Weblogic, Vignette StoryServer, Tibco, ActiveMQ, D/COM, others

**SCM:** Git, Subversion, AccuRev, ClearCase, CVS, Perforce, ClearQuest, Mercurial, Jenkins, RedMine, Remedy, JIRA, SharePoint, others

**Graphics:** Qt4/5 (PySide/pyqtgraph), OpenGL, FLTK, Gtk, GLUT/GLUI, matplotlib, Photoshop, Acrobat, PowerPoint, others

**Networking:** TCP/IP, UDP, SSH, NFS,SNMP, Wireshark, rsync, natd, ipfw, lsof, nmap, qmail, postfix, squid, tftp, others

**Telecomm:** T1 CAS/Robbed-Bit, ISDN (NI2, Q.SIG, 5ESS), VoIP, Asterisk, Aculab, Dialogic, others

**Simulation:** DIS, HLA/RTI, OneSAF (OTB/OOS), NASA Trick,NVTherm, S2Focus, CSF, EADSIM, ATCOM, others

**Architecture:** DoDAF/MoDAF, UML, Rational, DOORS, ClearQuest, ARTiSAN RTS, SLATE, ReqPro, Altova, Coverity, others

Employment History

**Sep 2017 – Present Wasatch Photonics**

*Director of Product Quality Morrisville, NC*

Support product hand-off from engineering to manufacturing and production. Help improve product quality across engineering and operations. Oversee test design and execution for new prototypes and custom projects. Provide engineering scoping for new projects, and contribute to requirements development. Provide customer-facing and internal technical documentation for products and procedures. Help drive technical recruiting across engineering and operations. "Find a hole, and fill it."Support product hand-off from engineering to manufacturing and production. Help improve product quality across engineering and operations. Oversee test design and execution for new prototypes and custom projects. Provide engineering scoping for new projects, and contribute to requirements development. Provide customer-facing and internal technical documentation for products and procedures. Help drive technical recruiting across engineering and operations. "Find a hole, and fill it."

*R&D Engineering Manager Orlando, FL*

Lead development of R&D / OEM engineering projects and new commercial products out of our Orlando R&D office, primarily with a focus on electrical, software and application-domain aspects. Typical projects include new sensor integrations, system miniaturization, low-jitter timing, ground management, advanced optical design, application validation, DFM rationalization and supply-chain mitigations. Responsibilities include requirements management, design reviews, ISO documentation, customer interface, recruiting outsourcing, and managing to deadlines and test criteria.Lead development of R&D / OEM engineering projects and new commercial products out of our Orlando R&D office, primarily with a focus on electrical, software and application-domain aspects. Typical projects include new sensor integrations, system miniaturization, low-jitter timing, ground management, advanced optical design, application validation, DFM rationalization and supply-chain mitigations. Responsibilities include requirements management, design reviews, ISO documentation, customer interface, recruiting outsourcing, and managing to deadlines and test criteria.

*Sr. Software Engineer Orlando, FL*

Developed Bluetooth Low-Energy (BLE) iPhone and Android Raman applications with REST backend. Maintained ENLIGHTEN™ cross-platform spectroscopy application, adding features including absorbance, irradiance, calibration, peakfinding, compound identification, EEPROM management, multiple spectrometers, baseline correction, through-barrier deconvolution, Richardson-Lucy focal deconvolution, others. Developed RamanSpecCal production software for spectrometer QC including laser hysteresis and parabolic approximation with AWS back-end. Developed .NET and C/C++ application drivers. Developed GUI programs to control Sony IMX sensors through USB, I2C and HDMI. Developed UV Camera iPhone app with custom kernel filters, gamma, registration and color processing. Developed sulfide Raman concentration model and desmile algorithm. Integrated and ported algorithms from KnowItAll and university research groups. Supported customer applications for COVID-19 detection, glucose monitoring, explosive precursors, molten polymers and more. Designed Raman training poster. Tools used included C#, C/C++, Qt, Python, Xamarin, Visual Studio, XCode, Swift, Kotlin, LabVIEW, R, MATLAB, Delphi, others.

**Jul 2016 – Sep 2017 NASA Kennedy Space Center, FL**

*Software Engineer VI* *(via SGT, Inc)*

Transitioned from contract to full-time role, continuing to support SCCS simulation framework for Launch Control System test and training. Major projects included Health & Safety PLC tags, PLC ethernet load-balancing, providing external API to "stomp" private runtime PLC variables, advanced battery controller SCPI comms, freeze/thaw of multi-emulator distributed sim, etc. Duties include supporting/extending a Perl script that drove a Java application using XSLT to dynamically re-write PLC ladder-logic encoded in XML to reroute ethernet SCPI messages over CIP to a C++ service ticking Simulink tested via Python and TCL because yay spaceships.

*Sr. Software Engineer (via Vencore/TechUSA)*

Supported Spaceport Command and Control Systems (SCCS) Simulation Framework for Launch Control Center (LCC) system test and operator training, particularly toward SLS/Orion Exploratory Mission 1 (EM-1). Supported integration of models and simulations for Ground Systems Development and Operations (GSDO) including Rockwell RS5000 PLCs, LH2/LO2 hypergols, Multi-Purpose Crew Vehicle (MPCV/Orion), Intermediate Cryogenic Propulsion System (ICPS), Navitas Battery Management Systems (BMS) etc. Specific tasks included scripted build process refactoring, PLC interface object-oriented refactoring, multi-tier enhancements, scenario fixes, Jenkins configuration, TCID support, system documentation, and development of unit, integrated and L5 tests. Tools used include NASA Trick, Linux, C++, Java, Python, Perl, TCL, Common Industrial Protocol (CIP), Pyramid Ethernet/IP SDK, Rockwell SoftLogix, SCPI, XSLT, Jenkins, Cobertura/gcovr, UnitTest++, Doxygen/GraphViz, NetBeans, AccuRev, ClearQuest, Code Collaborator, Windchill, OS/COMET, OpenView etc.

**Oct 2011 – Jun 2016 Ocean Optics Orlando, FL**

*OEM Engineering Manager*

Lead multi-disciplinary team of electrical, mechanical, optical, software and chemical/application engineers in development of quick-turn prototype systems. Oversaw projects including food quality analysis, petrochemical QC and pipeline monitoring, dairy pathogen detection, IED explosive detection, police forensics for narcotics and accelerants, pill sorting, smartphone manufacturing, crop monitoring, engine fluid analysis, emission monitoring in factories and seagoing vessels, deepwell temperature monitoring, DNA matching, PLC process control, nanoparticle sizing, currency authentication, medical assay, accessory design, Raman microscope design and others. Direct tasks included project management, customer presentations, requirements management, design of test, design and code reviews, product specifications and engineering procedure definition. Responsibilities include hiring, functional management, project management, project proposals, schedule and budget estimates, lab design and instrument calibration, inventory control etc.

*Senior Software Engineer*

Developed GUI and embedded handheld applications for: spectral processing; Raman, SORS, SERDS, and SERS for explosives detection, including standoff and rastered; through-container pharmaceutical assays; medical biopsy; anti-counterfeit spirit brand recognition; ethanol analysis; SO2/NO2 monitoring for factory and seagoing emission sources; food quality control; Fabry-Perot interferometry; microLIBS clients. Developed peak-finding and signature recognition algorithms using Ricker wavelets, Savitzky-Golay filters, Z-scores and Neural Networks. Developed mobile apps on iOS and Android. Extended and maintained SeaBreeze USB device driver; buildmaster for OmniDriver driver suite; conducted trade studies for detectors, gratings, microcomputers and tablets. Project management and application support for shale oil analysis, water purity control, allergen detection, tissue analysis, UAV agricultural analysis, HIV detection, glycol and oil analysis, semiconductor manufacturing, others. Specified position descriptions, interviewed candidates, created and tracked project schedules, defined system and test requirements, developed product roadmaps, served as facility Laser Safety Officer. Hardware platforms included x86/x64, ARM, OMAP3530, PIC24, Atom and Blackfin processors. Projects used C, C++, C#, Java, WinXP/7/8/RT, Linux, MacOS, Android, iOS, SPI, I2C, RS232, LabVIEW, MATLAB, R, BitBake, svn, Mercurial and Git.

**Oct 2008 – Jul 2011 Amazon.com Slough, UK**

*Software Development Engineer*

Developed distributed web services in support of global websites. Architected solutions based on loosely-coupled message queues, horizontally scalable facades, robust fallback-retry-rediscover algos, platform-neutral and standards-based protocols, deployed behind load-balanced VIPs. Services designed to support zero-touch config, automated metrics collection and distributed trend analysis with threshold alarming. Development included continuous build (Hudson), dependency validation and graduated fleet deployment. Individual projects included Javari.co.uk launch, pricing proxy service, SimpleDB returnability pipeline, automated textbook recognition system, regression test framework, predictive fault monitoring, and tools development. Team projects included European Fulfillment Network, Amazon.it national rollout, and C++ migrations to rule-based architecture. Engineering duties included feed integrations, code reviews, and on-call rotas. Leadership roles included project scoping, manpower analyses, interviewing, peer evaluations, and mentoring engineers in Paris, Munich, Beijing, and Chennai. Tasks utilized Linux, Java, C++, Perl, and Oracle. *(\*EnvImprovement “Ninja Master”; 2011 “Buzz Lightyear” Award; 2nd place, 2009 Innovation Week; 3rd place, 2008 Innovation Week)*

**Jul 2006 – Aug 2008 General Dynamics C4 Systems Orlando, FL**

*Sr. Staff Software Engineer*

Software Architect for Future Combat Systems Manned Ground Vehicle Training Common Components surrogate: converted XML-RPC interfaces to RMI; ported system from FC6 to RHEL3; maintained data logger, AAR, exercise manager, frustum viewer, and data model; updated SDRLs including SRS/IRS, SADD/SDD, IDD, and SVD. Task used C++, Qt, UML, DIS, SoSCOE, MySQL, SQLite, Moodle, rpm, and Flash. Lead Software Engineer in DCGS-A 4.1 prototype using JBoss, WebLogic, EJB, Saba IMI, ClearQuest. Supported FCS Level-One Fusion using Linux, C++, pthreads, Perl, Gtk, CVS, X11, valgrind, and SharePoint in CCMI 5 environment. Tasks included developing Xerces replacement; memory profiling; supporting Test Readiness Review and FQT; writing BOEs and PERs. Developed and led reviews of Preliminary Design Review slide decks, AL1/AL2 use case analysis, technical interchange meetings, etc. Supported DOORS-based extended-team peer reviews for vehicle systems including propulsion, chassis, turret, armor, and platform defense. Supported relationships with subcontractors and COTS vendors. Initiatives included: Technical Brown Bag series, creating and delivering 9 training courses; Technical Discussion Board; departmental SharePoint Wiki; project adoption of SPR branching, nightly builds, automated API documentation, common script VOB; technical reference library. *(\*General Dynamics Hero award, Bronze Eagle award)*

*Consultant (via Hudson Consulting)*

Supported FCS Level-One Sensor Fusion IPT via development of SIL test suite, including PubSub messaging applications, SoSCOE build automation, IDL translation, XSD validation, class factories, message statistics, logging service, integration test driver, regression test framework, corefile analysis, etc. Tools used included RHEL3, C++, Java, CORBA, Perl, Xerces, Xindice, Qt, XSD, XML, ClearCase, JScript, COM, and Altova XMLSpy. Supported customer relationships with Lockheed Martin prime and Boeing LSI.

**Nov 2005 – Jun 2006 Interactions, LLC Orlando, FL**

*Sr. Developer*

Supported high-traffic VoIP service using SuSE Linux, FreeBSD, PostgreSQL 7/8.x, Java 1.5, JNI, JMX, C++, Aculab Prosody, Ant, CVS, Subversion, lame, javadoc, Eclipse, speex, XML, JIRA, Confluence, JSPWiki, and others. Duties include developing realtime hardware interfaces, protocol analysis, architecture modeling, audio conversion, XML processing, UML docs, client NOC support, etc.

**Sep 2005 – Nov 2005 MyOnlineNeighborhood.com Orlando, FL**

*Sr. Developer*

Supported realty websites using CentOS, MySQL, PHP4/5, CVS, named, Apache, qmail, and vpopmail. Maintained server farm, system security, configuration management, customer email, billing system, and backups.

**Apr 2001 – Aug 2005 Lockheed Martin Missiles & Fire Control Orlando, FL**

*Staff Research Engineer*

Developed sensors & weapon DoDAF C4ISR architecture for Unmanned Combat Armed Rotorcraft (UCAR); developed architecture management system combining Artisan RTS with MS Office via OLE / COM and ODBC; created scripts to support DoD AIS Ch8 security audit requirements; supported FCS Ground and Aerial Sensor Integration proposals; automated CVS-Razor CM migration; represented team at Armor and Infantry conferences. Provided operational analyses for UCAR CONOPS, ATR, and sensor coverage planning; supported system and subsystem requirements derivation; coordinated with LM-ATL, LM-SI (Owego), and other LM companies managing UCAR IPTs; ported and refactored Sensor-Terrain Interaction Model (STIM) from SGI to Windows & Linux; rearchitected PRISM EO environmental model in support of JSF Shared Synthetic Environment Risk Reduction Demonstration (SSE RRD); coordinated with LM-STS to extend and integrate JSAF into SSE; supported special programs. Prototyped VSIM MIL simulation under IRAD. Coordinated with US Army Common Simulation Framework and university research teams*.* Supported special programs. *(\*Special Recognition Awards)*

*Sr. Research Engineer*

Upgraded PRISM IRST model for JSF Electro-Optical Targeting Sensor; ported simulations from SGI to Linux, Solaris, and Windows; coordinated JSF system integration deliverables with LM-Aero (Ft. Worth); ModSAF/OTB testing; extended C++ FLIR92 acquisition model; developed OpenGL defilade model; conducted UAV & sensor analyses; developed EADSIM scenarios; created CM, build, documentation, and distributed execution framework; supported COTS development environment. *(\*Special Recognition Award)*

*EIS Consultant (via Maxim Consulting)*

Migrated Sybase/Solaris application to Sun E10K. Developed 3-tier client-server proof-of-concept using Java, JDBC, and servlets. Scripted build system and SCM repository migration, led middleware trade study, and developed performance benchmark suites.

**Jul 1999 – Mar 2001 RCN Telecom Orlando, FL**

#### Development Manager

Managed development, project tracking, and rollout of 3-tier client/server applications for Yahoo! Companion, Express, and IMprompt2 internet appliances. Led development team to meet functional and technical specifications, test requirements, and launch schedule. Oversaw system design for account administration and authentication, synchronization, mail services, dialing system, protocol translation, and wireless notification. Systems developed with Weblogic EJB, RMI, C/C++, Perl, TCL, and SQL Server. Supported partner relationships with Yahoo!, SkyTel, MCI WorldCom, and VTech.

*Senior Developer*

Developed C/C++, Java, Perl, and TCL programs for: authentication, web browsing, spell-check, account management, log analysis, system monitoring, and MIME processing. Specialized in RFC-822 email, POP3, IMAP, RADIUS, MIME and procmail. Produced UML system documentation. Automated cable-modem provisioning service using Perl, Python, Java, SNMP, tftp, SQL, and Solaris, using Nortel CMTS and 3COM CM’s. Provided tier-3 CSR, sysadmin, and DBA support for VTech Production Environment using SQL, Java, servlets, Perl, and Solaris. Supported conversion of telcom billing system from Telution to Portal/Glarnet.

### Feb 1997 – Jul 1999 The Orlando Sentinel Orlando, FL

*Web Developer / DBA*

Developed Go2orlando.com and BlackVoices.com with Vignette StoryServer using TCL, SQL, and Perl, creating chat servers, user registration, search engine, image gallery, workflow-approval, and log analysis systems. Provided Sybase DBA and Y2K remediation. Administered NetWare & AIX servers, desktop support, inventory and IT budgets, staff training. Supported CFN13 launch.

**Aug 1992 – Feb 1997 School District of Osceola County Kissimmee, FL**

*Technology Resource Teacher / MIS Programmer.*

Taught middle grades 6-8 and adult education programming courses. Developed Unisys COBOL applications on DMS II RDBMS, GIS redistricting using MapInfo and dBASE, maintaining datacom networks. *(\*Sallie Mae 1st-Year Teacher of the Year Award)*

**Mar 1990 – Aug 1990 Martin Marietta Electronics and Missiles Orlando, FL**

*Student Co-op*

Maintained Tektronix device code for LANTIRN MTS maintenance kiosks, C apps on VAX/VMS, and provided hardware lab support.

Education

**Bachelor of Arts,** Computer Science, 1992

**Capital University Columbus, OH**