**DR. CHARLES H. BEGIAN**

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**Certifications: CompTIA Security+ CE (#COMP001021207829), ISC2 CISSP (#686223)**

**DoD 8570: IAT Level III, IAM Level III, and IASAE Level II**

**Security Clearance: DoD Top Secret (SCI Eligible)**

**SUMMARY:**

Dr. Begian is a highly effective cyber, systems, and software engineering professional, with extensive experience in both Government/Military and commercial systems. His research interests include cybersecurity for 5G cellular and other wireless networks. He has a track record of success in a wide variety of roles:

* As a ***Cyber Architect***, he applies knowledge from his DoD 8570 IAT/IAM Level III certification to ensure Northrop Grumman’s projects comply with DoD cyber requirements.
* As an ***Engineering Department Manager*,** he supervises engineering staff to ensure team performance while meeting company staffing and retention goals. He also manages vendor relationships, resource assignment, and performs project scheduling and tracking.
* As a ***Principal Investigator***, he researched innovative technologies, using the results to write technical and cost proposals for Federal Government RFPs.
* As a ***Business Analyst,*** he engages stakeholders to gather requirements and model business processes, capturing these in use cases and UML, respectively. He successfully translates business processes into requirements and uses those requirements to develop system test plans.
* As a ***Senior Systems Engineer,*** he translates business requirements into system requirements, plans and oversees integration of various subsystems into a delivered system, and performs integration and system testing.
* As a ***Senior Software Engineer,*** he translates system requirements into software requirements, performs OOA and OOD, documenting the results in UML. He then implements that design in well-documented code and performs software testing to ensure correct operation.
* As a ***Subject Matter Expert (SME)*** he is consulted by SOFWERX to provide expertise on Artificial Intelligence and Cybersecurity for future USSOCOM requirements.

**Methodologies and Standards:**

Rational Unified Process (RUP) Object Oriented Analysis/Design/Programming (OOA/OOD/OOP)

Structured Analysis/Design (Demarco/Yourdon) MIL-STD-2167A / MIL-STD-498 Agile UML

**Programming Languages, Operating Systems, Tools, and Specialized Technologies:**

Languages: C, C++, Ada, Pascal, SQL, Java, C#, Python Unix shell scripts, sed, awk

Assembly Languages: IBM 370, Intel 80x86, Motorola 68000 Databases: Sybase, Oracle, MS-Access

Unix flavors: SVR4, HP/UX, Solaris, Ultrix, Irix, Linux Microsoft Windows

Wireless Technologies: ZigBee, IEEE 802.15.4, Bluetooth, 5G Email protocols: SMTP, IMAP, POP

Middleware Technologies: CORBA, Tuxedo Development tools: NetBeans, Eclipse, JTest, Visual Studio

Java Technologies: JAXB, JDBC, JNI, J2EE, Java EE Network Protocols: TCP, UDP, BGP

Other Tools/Technologies: ACE Threads, TSCE-I, Web Services, ESB, Mule, Apache HTTP Server, GlassFish, XML, HTML5, Fortify, Rally, Git, JIRA, Cameo, Splunk, OllyDebug, Immunity Debugger, Windbg, IDA Pro, Ghidra

IBM/Rational tools: RequisitePro, Rational Rose, ClearCase, ClearQuest, Rhapsody, Rational Software Architect (RSA), DOORS

**EDUCATION:**

PhD. in **Offensive Cyber Operations** (OCO) – Dakota State University, Madison, SD (GPA 4.0) 2023

M.S. in Cybersecurity (concentration in Cyber Intelligence) – University of South Florida, Tampa, FL (GPA 4.0) 2018

FAA certified Private Pilot - Airplane, Single-Engine, Land - Instrument Airplane Rating, COMAIR Academy, Sanford, FL 1995

M.S. in Computer Science (concentration in Software Engineering) - Johns Hopkins University, Baltimore, MD 1992

B.S. in Computer Science - University of Michigan, Ann Arbor, MI 1986

**ADDITIONAL SPECIALIZED COURSEWORK:**

Cryptography I – Dan Boneh, Stanford University, Stanford, CA (Coursera.com) 2016

CYB5630V Cyber Table Top, Defense Acquisition University 2023

**RESEARCH PUBLICATIONS:**

*Analysis of Fuel Pump Skimming Devices*. Presented at the Third Annual International Conference on Knowledge Management Systems, Hilo. HI (May 2020). Published in conference proceedings: <https://dl.acm.org/doi/10.1145/3404663.3406874>

PhD Dissertation: *Detection of Cyber Vulnerabilities in 5G Femtocell Firmware Using Static Analysis Tools*, Dakota State University (2023). Available at: <https://scholar.dsu.edu/theses/441>

**RECENT TECHNICAL CONFERENCES:**

Subject matter expert in Cybersecurity and Artificial Intelligence for SOFWERX Innovation Foundry, Tampa, FL 2020-present

ICCWS 2022, the 18th International Conference on Cyber Warfare and Security (virtual) 2023

Red Dragon Rising: China in Cyberspace, Tampa, FL 2023

INSA Intelligence and National Security Summit (virtual) 2020

Great Power Competition Conference (virtual) 2021

Dakota State University Cyber Research Symposia 2019-2023

UCDSMO Cross Domain Technical Forum, Laurel, MD 2018

USF Cybersecurity Research Symposium, Tampa, FL 2017-2018

Florida Center for Cybersecurity Conference, Tampa, FL 2016-2019

**AFFILIATIONS / MEMBERSHIPS:**

Association of Computing Machinery (ACM) National Defense Industrial Association (NDIA)

Tampa Bay Electronic Crimes Task Force (TBECTF) Intelligence and National Security Alliance (INSA)

**EXPERIENCE:**

**Two Six Technologies (remote) March 2024 – Present**

**Senior Cyber Researcher**

Static analysis of 5G base station firmware to identify vulnerabilities for exploitation by DoD CNO assets. Reverse engineering of ARM64 firmware in Linux using Ghidra.

**Northrop Grumman Defense Systems (remote) July 2017 – January 2024**

**Cyber Architect**

Cybersecurity engineering for ATHENA-R and HADES proposal efforts. Evaluation of CSfC solutions and cybersecurity SAST tools. Cyber requirements engineering for Northrop Grumman’s CHORD FMS CDS product, aimed at ensuring compliance with NSA NCDSMO “Raise the Bar”' (RTB) CDS requirements. Served as Cyber SME for ATHENA-R proposal, a strategic opportunity for Northrop Grumman, and provided Cyber expertise for ATHENA-R subcontractor. Provided MBSE modeling in Cameo for MS Combat Cloud IRAD. C# software engineering for a satellite ground station system. Agile development with 2-week sprints. Atlassian toolset. Network quality of service dashboard developed with Splunk for USAF Distributed Mission Operations SCARS Pathfinder project. Provided systems engineering support to SCARS Pathfinder. System modeling performed with Cameo and SysML. Project sprints tracked in JIRA. Systems engineering support for USAF B-2 modernization program. Supported DMON DCDS implementation of RTB CDS requirements. Product owner for SILENTWIRE™ Cross Domain Solution. Responsible for incorporation of RTB CDS requirements into SILENTWIRE™ design. Remote software QA support for 524 UON project. Quality findings documented by Fortify. Project sprints tracked in Rally.

**Self-Employed August 2016 – July 2017**

**Software Consultant**

Designed and developed embedded software for Verifone VX and MX series credit card readers. Software is written in C++ and HTML, running on the devices under Verifone’s Verix and V/OS operating systems. Developed software build automation tools in Java, leveraging the Perforce P4Java API.

**Human Solutions Inc. (HSI) Washington, DC September 2014 – July 2016**

**Senior Software Engineer**

Supported the Enroute Technical Assistance Support Services (ETASS) contract as part of the FAA’s Optimization of Airspace and Procedures (OAPM) Metroplex Implementation Team, designed air traffic control training scenarios at several FAA air traffic control centers (ARTCCs). Used GSGT/SGET tool for scenario construction and testing.

**Advanced Systems Design (ASD) Inc., Clearwater, FL October 2012 – April 2014**

**Strategist**

C++ / Tuxedo/ Oracle and Java software development for the Veteran’s Administration (VA) VetsNet and Caregiver Stipend programs. VetsNet manages claims, awards, and payments for a variety of VA benefit programs. It utilizes Tuxedo middleware to process transactions between the user interface, C++ business logic layer, and an Oracle database layer.

As a member of the C++ Middle Tier team, designed and implemented enhancements to C++/Tuxedo code base to incorporate new business rules. The team uses an Agile development methodology, with a 3-5 week sprint cycle. Modeled software design in Rational Software Architect (RSA). Presented design at formal review meetings. Conducted peer reviews of other team members’ work product. Performed integration testing prior to each release. Developed Java test tool to exercise C++/Tuxedo services. This tool uses JAXB to persist test data, and JDBC to populate an MS-Access database. It then invokes the services being tested, which use the database tables as input.

**Kforce, Inc., Clearwater, FL February 2012 - October 2012**

**Sr. Software Engineer/Consultant**

C++/Solaris software consulting services for the VA’s VetsNet project. Migration of existing code base from C++ / Tuxedo architecture to Java-based web service architecture. Provided C++/Solaris software design and development services for the VA’s Caregiver Stipend Program (CSP), which calculates monthly stipend payments for caregivers of disabled veterans. CSP consists of a web service user interface, which uses Tuxedo to invoke business logic (written in C++), with Oracle as the database layer. Stipend payments are calculated and sent to the US Treasury for payment. Successfully designed, implemented, and tested CSP business logic in C++, and integrated it with legacy VetsNet code base.

**Raytheon Network Centric Systems (NCS) St. Petersburg, FL June 2008 - April 2011**

**Sr. Software Engineer**

BCME BCTM Software Engineer. Designed, implemented, and tested upgrades to an automated testing tool (FATHM). This tool allows the I&T team to automate testing of BCME software. FATHM is a multi-threaded Java application, which interfaces to Boeing’s SOSCOE product. Mentored junior team members in Java and Java/C++ interfacing (JNI). Also responsible for updates to IBM DB2 testing database. Further supported software integration testing by implementing, debugging, and executing integration test scripts. Merged test script and message file versions in Clearcase.

AITG Radio Software Engineer. Modified AITG radio software to resolve problems and add functionality requested by the customer. Demonstrated software functionality to customer during formal lab testing.

JTT Radio PPSS Block 6 Software Lead. Responsible for assigning resources to project tasks, tracking performance metrics (earned value management – CPI and SPI) and supporting monthly PMAT and EPR meetings. Prepared variance reports. Revised WADs to accurately reflect project tasks, completion criteria, and budgeted hours. Met daily with JTT Block 6 Project Engineer and other IPT members to ensure that the software effort remained on track, and that roadblocks were resolved quickly. Managed requirements with DOORS tool. Input data into iMetrics. Managed resolution of open software issues with iTracker. Interfaced with Program Manager and customer to achieve project objectives. Completed Raytheon R6σ Specialist training.

**Custom Manufacturing and Engineering (CME) St. Petersburg, FL May 2005 - June 2008**

**Engineering Manager**

Engineering Manager of CME’s Sensor and Power Engineering Department. Supervised a staff of 12 engineers of various disciplines (mechanical, electrical, RF, and software engineers). Responsible for assigning resources to projects and evaluating performance of individual engineers. Heavily involved in new business development, proposal writing (SBIR and larger proposals) and costing (including development of BOEs) systems engineering, vendor relationship management, project scheduling and tracking.  Process owner of CME’s new software engineering process as part of the company’s SEA (Supplier Excellence Alliance) initiative.

Senior Systems Engineer. Responsible for systems engineering, software engineering, technical research, proposal writing and new business development activities with areas of concentration in power systems and wireless sensors. Involved in design of 802.15.4 and ZigBee wireless sensor networks. Principal Investigator for CME’s sensor Fusion project (sniper detection) for the US Army’s Intelligence and Information Warfare Directorate. Investigated characteristics of specialized sensors and devised algorithm for fusing sensor readings to identify sniper firing positions.

**EARLY CAREER (Summarized)**

**Light Software Solutions, Inc. Tampa, FL February 1994 - May 2005**

**President / Software Consultant**

Systems Engineering services for RUP-based project for Airline Operations Center management. Implementation and testing of Java and C++ software under Sun Solaris for the U.S. Navy's DD(X) (now Zumwalt) program. Interfaced with XML classes via JAXB. Implemented a thread pool using the ACE thread library. Performed requirements analysis and UML modeling and design of health care system for the State of Florida. Led JAD sessions, wrote project use cases, test cases, and test scripts. Used Rational tools (RequisitePro, Rose, ClearCase, ClearQuest) and Visio for requirements management, business and object modeling, version control, and change management. Designed and developed Java Swing GUI for DES3 encryption and decryption utility. Interfaced GUI to C encryption engine. Use case specification and requirements analysis for RUP-based project for processing dental insurance claims. Java/Solaris development of interface code for email parsing application. C++/Solaris development for AT&T order fulfillment system. Design and development of X-Windows/Motif GUI for the SH-60B Navy helicopter instructor station. Requirements analysis for identification of system requirements for the Subscriber Management System (SMS). Used Rational’s RequisitePro and Rose tools to manage requirements and build system model in UML. GUI developer for Integrated Tasking and Networking (ITN) component of the Federal Bureau of Investigation’s Automated Fingerprint Identification System (AFIS). Lead software engineer for development of an X-Windows/Motif military logistics modeling application in C and C++. Application Engineer for development and integration of Release 2 paging and messaging functionality for Motorola Iridium project. Systems Engineering for an IOC interface of the Defense Information Systems Agency (DISA) Defense Software Repository System (DSRS) to the Reuse Library Toolkit (RLT) as part of a support task for the Logicon I-CASE contract. Responsible for software design, composition of MIL-STD-498 deliverable documents (SDD, STP, STD, STR) and design review presentations to the Federal Government. X-Windows/Motif interface design and development using Xlib, Xt, Xm, and UIM/X on Silicon Graphics workstation for US Navy E2-C flight trainer instructor station.

**Computer Sciences Corporation (CSC) St. Petersburg, FL February 1993 - February 1994**

**Member, Technical Staff**

Performed C/Unix/SYBASE design and development in support of US Special Operations Command J2 (Intelligence) directorate at MacDill AFB. Designed and developed military logistics modeling software as part of CSC's Logistic Sustainability Analysis team.

**CSC - Systems Engineering Division, Hanover, MD April 1989 - February 1993**

**Member, Technical Staff**

Designed, coded, and documented classified Sun/C/Unix(SunOS)/SYBASE National Security Agency (NSA) project. Project was designed and documented using CADRE/Teamwork and DataWorkBench tools. Presented my design to the customer at CDR. **All work was performed onsite at NSA, Ft. Meade, MD.** Team leader for PC/C/Unix(Xenix) software requirements analysis, software design, development, and testing of a classified satellite communications earth terminal controller. Sun/C/Unix(SunOS) software requirements analysis, design, and development as a member of a large (60+ individuals) project team. Sun/C/Unix(SunOS)/X-Windows(Motif) design, coding and testing for the US Navy's Acoustical Input Processing System.

**CSC - Network Services Division, Herndon, VA August 1988 – April 1989**

**Member, Technical Staff**

C/Unix software development and testing on AT&T 3B/400 and 5ESS packet switch for the FAA Voice Switching and Control System (VSCS) project.

**Jerry Thompson & Associates (JTA) Kensington, MD November 1987 - July 1988**

**Systems Analyst**

Systems analysis duties and operational scenario design for the VSCS project mentioned above. Performed analysis of voice and data traffic requirements for the FAA's Radio Communications Link (RCL) project.