Dr. Paul H. Comitz
2913 Leatherleaf Court
Mount Pleasant SC 29466
202-679-4397
pcomitz@live.com

SKILLS

- Engineering Leadership: Lead Systems and Software Engineering teams. Significant experience as a Chief Engineer/System Architect.
- Writing proposals and preparing bids. Extensive experience leading proposal teams.
- Program Management: Program Manager for multi-million-dollar engineering development programs.
- Software Development: Experience designing, coding, and testing software.
- Systems Engineering: Extensive experience preparing specifications, identifying and articulating requirements, and hands-on verification and validation of requirements.
- Extensive experience writing and preparing all types of technical documents.
- Extensive experience teaching and designing college courses in Information Systems, Computer Science, and Physics.
- Accomplished Public Speaker, member of Toast Masters International.

EDUCATION

- Ph.D. Computer Science, Nova Southeastern University, Ft. Lauderdale, FL, September 2013
- Master of Computer Science, Johns Hopkins University, Baltimore, MD Dec. 1998
- Master of Business Administration, University of Redlands, Redlands, CA, Jan. 1992
- Bachelor of Science in Electrical Engineering, SUNY Buffalo, Buffalo, NY, Jan. 1983
- Geographic Information Systems Certificate Program, The Pennsylvania State University, University Park, PA. December 2002

CERTIFICATIONS and PUBLICATIONS

- Global Information Assurance Certification in Cyber Security Essentials
- CCNA: Cisco Certified Network Associate
- Certificate in Photovoltaic Technology. Solar Energy Institute
- Instructor Credential, California Community College System.
- Publications: See Google Scholar https://scholar.google.com/citations?user=jS4oiYgAAAAJ&hl=en&oi=ao
- Publications: Research Gate https://www.researchgate.net/profile/Paul_Comitz

SECURITY CLEARANCES

DOD Secret
US Census Bureau Suitability (SF-85)
Federal Aviation Administration Suitability (SF-85)

Teaching and Education Experience

University of South Carolina Beaufort (USCB)
August 2023 to present: **Assistant Professor of Computational Science (Tenure-track)**
August 2022 to December 2022: **Adjunct Faculty, Computer Science**
Teach courses in Computational Science, Information Science and Technology, and Cybersecurity

University of Maryland Baltimore County, Baltimore, MD
June 2001 to Present: **Adjunct Faculty, Information Systems**
Teach accredited courses in Information Systems. Recent coursework in UMBC Online M.S. in Information Systems.

University of Maryland University College, Adelphi, MD
June 2002 to Present: **Adjunct Faculty, Information Systems and Computer Science**
Teach accredited courses in Information Systems and Computer Science. Designed and taught courses in cyber security.

Howard Community College, Columbia, MD
Jan 2001 to Jan 2002: **Adjunct Faculty**, **Computer Science**
Taught accredited Software Engineering courses in Assembly Language and Java Programming.

Harcourt Learning Direct, Scranton, PA
April 200 to Jan 2003: **Technical Author**
Develop online software engineering courses in Java Programming and Network Administration. Provide initial course syllabus. Provide content for the Harcourt Learning Windows Operating System Training Program. Subject Matter Expert for Java, Visual Basic, and Visual C++ education programs. Designed and implemented online web tour of new features in Windows operating systems for inclusion on Harcourt web site.

Anne Arundel Community College, Arnold, MD
August 1998 to December 1999: **Adjunct Computer Science Faculty**
Taught accredited computer science courses in Java Programming and Computer Architecture.

Cerro Coso Community College, Ridgecrest, CA
January 1990 to June 1992: **Computer Science Instructor**
Taught accredited Software Engineering courses in Computer Programming and Computer Architecture.

College Courses Taught and Designed

At USCB:
ISAT B212 Computer Architecture

ISAT B317 Intro to Digital Forensics

ISAT B318 Ethical Hacking

ISAT B401 Computer Security Principles

ISAT B409 Special Topics: Machine Learning in Cybersecurity

CSCI B422 Data Mining

CSCI B450 Modeling and Simulation

CSCI B550 Systems Modeling and Simulation

Information Systems Courses (taught at other institutions):
IS 147 Introduction to Computer Programming. An introductory programming course using the Java programming language.

IS 246 Special Topics, Programming with .Net. A course in programming with C#.

IS 247 Computer Programming II. The continuation of IS 147. Continued programming instruction using the Java programming language.

IS 310 Software and Hardware Concepts. A computer architecture course for Information Systems majors

IS 311 Enterprise Architecture. A course in Enterprise Information System Architecture.

IS 413 GUI Programming in Java. A course in Android Programming. Designed this course and created all material for this course.

IS 457 Cyberterrorism. A course in cyber security with an emphasis on international and political cyber security incidents. Designed course and created all material for course.

IS 461 Systems Analysis and Design. A course emphasizing information systems analysis tools and techniques.

IS 600 Introduction to Object-Oriented Programming Concepts. Introduce the graduate student of information systems to fundamental object-oriented programming concepts.

IS 668 Enterprise Wide Computing. A course on distributed computing architectures and web services. The course features hands-on development of web services and network access to those services.

IS 669 Project Management Operations. A course on modern practices in Information Systems Project Management.

Computer Science Courses (taught at other institutions):

CMIS 242 Intermediate Programming. Topics include data representation, assembly language, central processing unit architecture, memory architecture, and input/output (I/O) architecture.

CMSC 335 Object-Oriented and Concurrent Programming. A study of object-oriented and concurrent programming. Design, implement, test, debug, and document complex robust programs in an object-oriented language

CMSC 405 Computer Graphics. A hands-on, project-based introduction to computer graphics. Topics include programming in OpenGL and transforming, viewing, and modeling 2-D and 3-D objects.

CMSC 495 Current Trends and Projects in Computer Science. A final, capstone course for Computer Science majors. The goal is to research, plan, conduct, and complete collaborative computer science projects in compliance with schedule deadlines.

Engineering and Physics Courses

ET4560 C++ Programming. An introductory course in C++ programming. A hands-on approach with numerous programming examples and assignments.

PHY 2530 – Physics I and II. An introduction to Physics with an emphasis on classical mechanics and electromagnetism. Created extensive course materials – see https://www.slideshare.net/pcomitz. Created a website for students at https://drcomitz.teachable.com

Professional Courses and Seminars

Air Traffic Control Seminar. Working with subject matter experts designed a week-long seminar for Air Traffic Controllers. The seminar was given to practicing Air Traffic Controllers from 2012 – 2015.

Service Oriented Architecture. Led the Boeing Air Traffic Management Service Oriented Architecture Study group/Community of Practice.

Software Defined Radio – Developed a course in Software Defined Radio for the Raytheon Technologies Innovation Center.

PROFESSIONAL WORK EXPERIENCE

Raytheon Technologies Corporation, Annapolis, MD and Tucson, AZ
Oct 2019 to May 2023: Senior Systems Engineer
Senior systems engineer for Collins Aerospace Connected Aviation Solutions. Support pursuits of Air Traffic Management such as FAA Flow Management Data and Services in US. Support European ATM activities such as the Eurocontrol specification for SWIM ADS-C Ground Distribution Service.

Instructional Course designer for Raytheon Innovation Center University. Developed a course titled Software Defined Radio (SDR) for Engineers. The course features basic RF and radio theory and hands on development of SDR applications using GNU Radio. Presented an overview of the course at the Raytheon Multi-Function System Technology Network symposium in October 2021. Currently developing a hands-on Innovation Center course on programming mobile applications

Use programming languages such as R, Python and MATLAB Statistics and Machine Learning Toolbox to analyze factory production data. Tools are used to identify production bottlenecks, assess data integrity, and predict when factory production issues will occur. Analyze failure data from sampled lots of supplier parts to assess risk to parts in inventory. Analyze quality requirements given to suppliers. Perform Principal Component Analysis on factory production data to reduce and summarize large data sets.

Perform analysis of data link technologies across a diverse product set. Analysis includes identification and alignment of data link characteristics for the purpose of identifying and specifying a composable data link architecture. Specific technologies include Mobile Ad Hoc Networks (MANET), Link-16, and data links employing the Enhanced Position and Location Reporting System (EPLRS). Assess compliance of products with Modular Opens Systems Architecture.

Systems Engineer for the US Navy SM-6 Block 1B missile. Provide requirements for hardware and software subsystems. Lead small cross-functional teams from multiple government and industry organizations developing missile subsystem components.

Review candidate architectures for pursuit of FAA Enterprise Network System (FENS) opportunity. Maintain cognizance of FAA architectures and requirements relevant to FENS pursuit (i.e., System Wide Information Management) to ensure candidate architecture compliance.

Perform requirements management for missile avionics using DOORS. Work with project engineers to identify a taxonomy for avionics Control Actuation Systems. Responsible for realizing the taxonomy in DOORS. Taxonomy is currently in use by multiple products.

Senior Systems Engineer for Woomera, Australia Mobile Test Range System. Responsibilities included analysis of Systems Requirements in DOORS and subsequent preparation of Requirements Deviation Reports in support of system sell-off. Provide verification of system requirements by performing technical inspections, review of engineering drawings, and preparation of technical analysis reports. Lead team to present results of verification analysis to customer at Requirements Verification Review Board.

The MITRE Corporation, Tysons Corner VA
Dec 2018 to Oct 2019: **Group Leader Center for Veterans Enterprise Transformation**
Perform studies and analysis of alternatives for Veterans Administration Identity, Credential, and Access Management functionality required for Veterans Administration transition to Joint Electronic Health Record (EHR) capability.
Perform Independent Technology Assessment of Veterans Administration Caregiver program. Analyze data migration strategy, requirements management process, and overall application architecture.

April 2017 to Present: **Group Leader Transportation Data Analytics**
Leader of group responsible for the design, development, and ongoing maintenance of the CAASD Repository System (CRS). CRS is an archive of aviation and transportation data from multiple sources. Relational database and Hadoop (HDFS) technologies are used for archive and retrieval of widely varied datasets. Lead MITRE FAA System Wide Information Management (SWIM) activities including software development for SWIM clients, working with MITRE analysts to determine data needs, and primary point of contact with FAA.

Perform analysis and survey of the application of machine learning techniques for the improvement of data quality for the FAA. Work closely with NASA personnel to apply a One Class Support Vector Machine to time-series aviation data. Wrote code using Python to access time-series data from MITRE HDFS cluster for use in machine learning analysis. Provide proof of concept prototype and section in MITRE Technical Report detailing results.

As a Group Leader involved daily in a wide variety of extract, transform, and load activities, data capture and archiving activities, and analysis of data using modern analytics tools and techniques.

Dec 2016 to March 2017: **Lead Systems Engineer**
Provide support to the US Census Bureau Enterprise Data Management System Program Office. Specific tasks include analysis of extensive census bureau public API and analysis of data access and dissemination capabilities. Provide an API Assessment report, recommendations for best practices, and recommendations for an API Data Management and Governance Framework.

CACI International, Reston, Va.
July 2016 to December 2016: Chief Engineer
Chief Engineer for CACI pursuit of FAA Data Visualization, Analysis, and Reporting System (DVARS). Provided executive technical oversight for the entire program. Led effort to setup CACI aviation data access and analysis laboratory. Initial effort was to apply FAA System Wide Information Management (SWIM) data to CACI Big Data Ecosystem (BDE). Provided coordination and liaison between CACI and FAA for SWIM connectivity. Identified SWIM topics for use in big data prototype. Provided direction for extract, transform, and load of SWIM data into CACI Big Data Ecosystem. Identified use cases and experiments for evaluation of prototype capability.

The Boeing Company, Air Traffic Management, Chantilly, VA March 2003 to March 2016
September 2007 to March 2016**: Group Leader and Program Manager**
Program Manager of multiple contract and internal r&d programs focused on advanced aviation information management in a modern service oriented architectural environment. Recent FAA contracts

included Collaborative Information Management (CIM), Aircraft Access to SWIM (AAtS), and Trajectory Based Operations for UAS (TBO/UAS). The CIM information security program integrated the US Air Force C-17 aircraft flight simulator in Long Beach, California with the FAA Mini Global environment in Daytona Beach, Florida. The C-17 flight data was securely provided to the FAA NAS Enterprise Messaging System (NEMS) by presenting a SAML 2.0 Holder of Key token to the FAA NEMS. AAtS provided the FAA System Wide Information Management (SWIM) data to the aircraft flight deck via an IP datalink. The TBO/UAS program provided a prototype capability to downlink aircraft intent from the flight deck via ACARS, generate a trajectory from the aircraft intent, and distribute that trajectory using the Flight Information Exchange Model (FIXM). Additionally, the TBO/UAS program assessed the suitability of UAS operations in Class A airspace NEMS. All three programs were successfully demonstrated at the FAA Mini Global Demonstration in April 2016.

Led the internal R&D effort to set up an internal aviation data archive and analysis capability. Built multiyear archive of aviation data. Provided data sets, on demand, to Boeing Commercial Airplanes organization. Led the effort to analyze archived data using products like IBM Cognos and IBM SPSS.

Leader of the internally funded International Airspace Efficiency program. This program integrated laboratories in the US with laboratories in Europe, India, Brazil, and Australia. The objective of the program was to perform aviation operations research in a distributed environment using combinations of real and simulated systems. Specific experiments included North Atlantic Traffic Flow Management, providing airspace and flight route efficiency in the North Atlantic, as well as trajectory-based operations leveraging the Aircraft Access to SWIM development (described above) to provide trajectory information to the flight deck in an oceanic environment.

Chief Engineer and Program Manager of the Network Enabled Operations (NEO) Spiral II program. This program focused on UAS Operations in the National Airspace System. The program featured the integration of a Flight Management System (FMS) with a UAS Ground Control Station. The FMS was integrated with a SWIM compliant service-oriented information management environment. The aircraft intent information from the FMS was used to generate a 4-dimensional trajectory that was shared with the FAA automation systems ERAM and STARS. Live flight demonstrations were performed and demonstrated.

September 2007 to March 2016: **Information Systems Group Manager**
Manage all aspects of the Information Systems Group at Boeing Air Traffic Management. The job required assignment of day-to-day tasking in diverse areas such as software development, systems architecture, integration and test, and information systems laboratory maintenance and administration. Perform employee performance evaluation and salary management. Manage multimillion-dollar internal research and development budget.

August 2006 to July 2007: **Chief Engineer FAA System Wide Information Management Prototype**
Technical leader and day to day program manager of the effort to establish requirements, design, develop, and deliver an enterprise data information management system to the FAA. The major system components were IBM WebSphere Application Server, Tivoli Access Manager, Tivoli Directory Server (LDAP), and Tivoli Federated Identity Manager. The system included demonstrative aviation applications such as a NOTAMs Web Services and surveillance data distribution using Java Message Service. The system was delivered to the FAA William J. Hughes Technical Center in Atlantic City, New Jersey.

April 2005 to August 2007**: Chief Engineer Joint Network Enabled Operations Program**
Engineering leader of a combined government and industry team comprised of Lockheed Martin, Raytheon, Computer Sciences Corporation, MIT Lincoln Laboratory, and FAA and DOD personnel. This team successfully developed an enterprise information systems architecture that enabled communication and collaboration between government systems that used diverse technology and distributed communication mechanisms. The Enterprise Service Bus that was developed provided the capability for

geographically dispersed systems of the Federal Aviation Administration, the Department of Defense, and the Department of Homeland Security/TSA to communicate and collaborate.

Demonstrated and briefed completed initial system to senior members of industry and government including Cabinet level (Secretary of Transportation) and Administrator level (FAA Administrator) executives.

February 2003 to March 2005**: Data and Information Systems Engineering Lead**

Lead the software team developing the prototype for the Federal Aviation Administration's System Wide Information Data Management project. Define the system development process, build plan, schedule, task assignment and coordination for a multiple organization industry and government team. Develop common messaging standards for a service-oriented architecture featuring web services from multiple vendors. Manage a distributed laboratory containing networking and software development tools from multiple platforms and vendors. Install, configure, and test prototype SWIM system at FAA William J. Hughes Technical Center in Atlantic City, NJ.

Provide leadership to an engineering team comprised of professionals from multiple technical organizations. This team was responsible for demonstration and flight test requirements definition for the FAA's Global Communications, Navigation, and Surveillance System (GCNSS) program. Subject areas included ADS-B over SATCOM, Controller-Pilot Two-Way Data Link over SATCOM, Controller-Pilot Voice over SATCOM, and integration with the FAA Surveillance Data Network (SDN). As team leader responsibilities included planning, coordination between multiple government and private organizations, delegation of work packages, risk identification, and risk assessment. This team successfully developed the requirements specification for the Flight Demonstration activities.

As a working member of the engineering team, wrote CORBA client software to receive aircraft position data and transmit to Surveillance Data Network. Provide java software to convert ADS-B data in text format to Eurocontrol ASTERIX Category 33 format. Provide java software to integrate Microsoft flight simulator with CORBA based FAA Surveillance Data Network.

Provide maps of flight test area using ESRI ArcGIS. Use ArcGIS API to calculate radar ellipses, potential flight paths, and flight path waypoints. Use ESRI Arc Engine and ESRI Tracking server to create applications for use with the prototype FAA System Wide Information Management capability.

Information Extraction and Transport, Arlington, VA

July 2002 to February 2003**: Director of Software Engineering**

Provide leadership to a team of engineers and scientists creating applications and APIs for Bayesian Probabilistic Inference. Specific leadership responsibilities include definition and establishment of a Software Development Process, resource allocation, preparation of schedule and budget. Function as technical team member defining and articulating system requirements and system architectures. Develop and write Java and C++ code as required. Review and prepare proposals (SBIR, STTR) for new business development.

Wells Fargo Corporate Trust Services, Columbia, MD

December 2001 to June 2002**: Software Application Architect**

Chief software engineer responsible for architecture and design of network enabled software tools for the secondary mortgage-backed securities market. Reengineer and redesign legacy applications as J2EE applications. Use BEA WebLogic 6.1 as host environment for Java Servlets, Java Server Pages and Enterprise Java Beans.

Thomson Prometric, Baltimore, MD

April 2001 to November 2001**: Software Development Manager**

Software Development Manager for http://www.2test.com website. Manage a variety of software development environments specializing in Java 2 Enterprise Edition Servlet, Java Server Page, and Enterprise Java Bean technologies. Relational Database Technologies include Sybase Adaptive Server

Enterprise and Microsoft SQL. Tools include Apache web server and BEA WebLogic 6.0 running on a Sun Solaris platform. Used Unix shell scripts and Perl scripts for build and deployment tools. Responsible for individual task assignments, job estimation, schedule and budget. Contribute as a working software developer by preparing design documentation, writing code, and performing system integration and test. Function as team system engineer providing requirements gathering and articulation.

Mentor Technologies Group, Annapolis, MD
January 2000 to March 2001**: Engineering Project Leader**
Develop software applications that provide internet access to high value computing equipment such as Cisco routers and switches. Provide technical direction and leadership to development team members. Write code and function as working member of software development team. Responsibilities and activities included:

- Configure Cisco Routers and switches.
- Design, develop, and deploy custom telnet daemon (Java on Solaris and Linux) for remote access application.
- Configure and deploy Linux and Solaris internet servers.
- Use Java RMI for inter-process and distributed communications.
- Frequent use of core software technologies: Java, JDBC/Sybase, Perl, and Tcl/Tk Expect.
- Design, install, and configure development and test networks using Cisco, Unix (Solaris and Linux), and Windows.
- Remote control of Microsoft Windows computers using network programming techniques.
- Remote control of Cisco networking equipment using network programming techniques and the Expect and Perl programming languages.

Northrop Grumman Corporation Calverton, NY, China Lake, CA, and Melbourne, FL, and Baltimore, MD
Feb. 1997 to January 2000: **Software Project Manager**
Software development manager for the DARPA Semi Automated IMINT Processing System (SAIP). SAIP is a UNIX/C++/Java software development for use with a supercomputer imagery processing system combining remote sensing, geographic information systems, automated target recognition, and advanced image processing techniques. Specific tasks included preparation of software designs using object-oriented techniques, production of Java and C++ source code, developmental testing, and overall systems engineering. Specify network and inter-process communications to serialize and transmit complex object data structures over a network. Used ODI Object Store object-oriented database for persistent object storage and retrieval.

Use java native interface to leverage legacy code for use with newly developed Java applications. Use java foundation classes for user interface. Use Java and C++ for imagery processing algorithms such as histogram equalization, linear log magnitude scaling of complex valued imagery data, gradient analysis, and edge and object detection. Developed text message generation and transmission capability using Java.

Managerial tasks include team leadership, scheduling, budgeting, cost estimation, and proposal preparation. Responsible for labor budget of over $2,500,000.

June 1995 to Jan. 1997: **Chief Engineer** E-8C Joint Stars Mission Support System
System Architect for high performance DEC Alpha 2100 client/server database initialization and maintenance system. Perform system requirements analysis and decompose top-level system architecture into major subsystems. Selected all hardware and software including high performance servers, graphics workstation, networking equipment, map digitizer tablet, cartographic preparation system (ESRI Arc/Info), and RAID storage system.

October 1994 to May 1995: **System Engineer**
TIER II+ Global Hawk Unmanned Air Vehicle ground station computer and communications complex. Member of System Architecture team specializing in local and wide area communications. Define

preliminary design for communications networks including Ethernet, ATM, and FDDI connectivity. Define requirements for connectivity to Tactical Intelligence Networks. Wrote System Specification and delivered to customer on cost and schedule. Produced software prototype of Unmanned Air Vehicle ground station displays.

August 1992 to September 1994: **System Engineer**
Navy F-14 Aircraft, Naval Air Warfare Center, Point Mugu, CA
Prepared software requirements and design documentation for F-14 mission computer Operational Flight Software. Software development of F-14 Systems Trainer with an emphasis on simulation of the AN/AWG-9 Pulse Doppler Radar. Wrote FORTRAN and C language code for trainer simulations in a UNIX environment.

March 1986 to July 1992: **Engineering Task Leader**
Navy A6E Intruder Aircraft, Naval Air Warfare Center, China Lake, CA
Provide direct supervision and task assignment for ten engineers. Develop software specifications and design documents for embedded mission computer input/output subsystems, graphics displays, and navigation systems. Wrote 1553B I/O device driver in assembly language. Wrote mission computer software for ballistics, vehicle navigation, and missile initialization in assembly language.

April 1983 to February 1986: **Systems Engineer**
Navy A-6E/A-6F Intruder, Calverton, NY.
Significant experience designing and coding real time embedded mission computer software.