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## Accomplishments

Over 15 years, I have been fortunate to find career success and satisfaction in the defense industry - beginning as a junior electrical engineer, developing senior algorithm subject matter expert, expanded into production lead and now mastering the lead system/chief engineer role. I always brought my best effort to projects that I’ve worked on because I believe in my customer’s mission to protect the warfighter – whether I’m working for Navy programs such as submarines processor updates and torpedoes sonar improvement, Army programs such as ground based interceptors and Radar warning receivers and jammers, or Airforce programs such missile mmW imaging Radar seekers and satellite intelligence collection. The following are some career highlights:

* Proven Team Builder – successful record to **leading 2-6 member teams with multidisciplinary skill sets and diverse background**. I take great satisfaction in developing junior engineers into future technical leaders; from hiring and recruitment through technical development and career mentoring.
* Multiple Trade Secrets – worked **over half-dozen research and development efforts** to innovate in multiple fields including modeling, simulation, analysis, optimization, expert classifiers, machine learning automatic target recognition, trackers and other proprietary algorithms.
* Technical Execution – improved manufacturing yield resulting over **$2M of savings** per year and making production contract viable; lead the performance simulation effort for one of **fastest missile development cycle** **of less than 18 months**; lead the technical volume on multiple proposals, resulting in **new business worth over $10M**; currently responsible for execution of **advance program worth $5M annually**.

## Professional Experience

**Lead Software Architect– Northrop Grumman Corporation**, Rolling Meadows, IL · 2/16 – Present:

* Within the RF electronic warfare (EW) design, I have provided technical leadership for half dozen engineers within the multi-disciplinary teams of software (C++ programmers), firmware (FPGA logic designers) and integration & test (Unit-Level verification).  
  Using Model Based System Engineering methodology, I have demonstrated the following benefits:
  + Cost & schedule compliance via reuse of existing models and reducing firmware & software iterations; I am involved in work breakdown, scheduling, tools, equipment and tasking
  + Refining design to meet or exceed requirements with stakeholder’s involvement; responsible engineering authority for the Design, Interface and Verification Documents
  + Promotes customer involvement and buy-in of key performance items
  + Modeling to provide FW & SW test vectors to drive verification and validation activities
  + Graphical User Interface/Experience that facilitates interaction across a multi-discipline team
* Satellite experience with multiple military organizations:
  + Integrated GPS and encrypted RF Datalink between military satellites and the smart weapons
  + Established RF links between military satellites, ground based dishes and phased array systems
  + Design new RF payload for satellites using commercial off the shelf components constraint by Cost, Size, Weight and Power (C-SWAP) plus the additional difficult technical challenges such as digital hardware package selection, radiation hardening and thermal dissipation
  + Space Situational Awareness experience include Doppler motion compensation, ionospheric correction, resident space object tracking and modeling of ephemeris geometry predictions for orbital determination
* Key contributor on many successful advance technology demonstration and critical customer funded R&D seedling projects that have the potential to transition into major programs.
  + Leveraging strong technical background knowledge to drive the development of a full end-to-end RF EW Digital Twin model, which for the first time captured Electronic Attack technique effectiveness versus adversary Radars before any hardware was built
  + Develop the analysis and testing real time visualization tools for airborne system that is capable of simultaneously identifying and jamming hundreds of enemy radars in the entire battlefield environment; hence the challenging Big Data analysis task of visualizing and assessing the system performance
* Architect Apprenticeship Program (AAP) Graduate December 2018 and Commencement Speaker
* Mentor for the High School Involvement Partnership program. Teacher Philosophy: I take pleasure in tutoring and mentoring junior engineers because I believe that one of most important responsibilities of senior engineer is to share knowledge.

**Systems Algorithm Development and Production Lead – Raytheon Missile System**, Tucson, AZ · 1/08 – 1/16:

* Seeker Sensor: In missile development, I have worked across the lifecycle development of several radar seekers/sensors in the areas of automatic target recognition algorithms and performance assessment of pre-flight prediction, followed by post-flight validation of the Integrated Flight Simulation 6-Degrees Of Freedom models.
* Calibration: Took ownership of the factory calibration routines, I improved manufacturability by increasing yield by over 30% and reducing calibration time by over 90% by applying Design of Experiment methodologies, which should result in over $2M of savings per year.
* Datalink: Developed anti-jamming uplinks from a ground-based radar to multiple missile interceptors to defend against rockets, artillery and mortars. As our simulations predicted, the weapon datalink system performed flawlessly on over 24 flight test missions.

**Sonar System/Electrical Engineer – Raytheon Integrated Defense System**, Portsmouth, RI · 5/06 – 1/08:

* Mastered the system engineering fundamentals of the V-Model and Dynamic Object Oriented Requirements System (DOORS)
  + Responsible engineer for the development of the Broadband Sonar Array Receiver Performance Specification and Interface Connection Document
  + RF test engineering experience using the latest vector signal generator, spectrum and network analyzers

The following links are to a few programs that I made a significant contribution on:

* + EA-18G: <https://www.youtube.com/watch?v=xb5UyTXTMtI>
  + SDB-II: <https://www.youtube.com/watch?v=hyaIrhGrCzo>
  + AI3: <https://www.youtube.com/watch?v=EeyIG4v7M5E>

## Programming Skills

* (12+ years) C++ for Embedded System interfacing with Xilinx FPGA in the following applications: high fidelity missile and sensor simulation, operational flight software, system integration and test, verification and validation
* (15+ years) I am an expert and teacher of MATLAB – in the areas of signal/image processing, digital filter design, machine learning, geospatial tracking, radiometry, and Design of Experiments. Other analysis tool includes:
  + Electromagnetic Tool Suite , System/Satellite Tool Kit (STK), Systems Modeling Language (SysML), DOORS
* (2+ years) Python for development and analysis for Space Situation Awareness

## Publications

* Chatterpaul Joseph, Severiano Sisneros , “Radar DNA (Deep Net Analysis)”, Proceedings, 2020 Northrop Grumman Mission System Symposium on *Innovation Exchange* (Rolling Meadows, IL)
* Chatterpaul Joseph, Konrad Nowak, Evan Baker, Michael Thomas, “Got a Complex Trade Study? Try Design and Analysis of Simulation Experiments”, Proceedings, 2020 Northrop Grumman Mission System Symposium on *Innovation Exchange* (Rolling Meadows, IL)
* Chatterpaul Joseph, Evan Baker, Henry Anderson, Michael Mistaleski, “Drone eWars”, Proceedings, 2017 Northrop Grumman Mission System Symposium on *Rising: Reaching New Heights* (Rolling Meadows, IL)
* Chatterpaul Joseph, Evan Baker, Paul Gal, Sudhanshu Vyas, “Designed for Proposal”, Proceedings, 2017 Northrop Grumman Aerospace System Symposium on *The Value of System Thinking* (Redondo Beach, CA)
* Chatterpaul Joseph, Richard Hasty and Christopher Shannon, “Now I see! – Visualizing our Data Products in Real Time”, Proceedings, 2016 Northrop Grumman Mission System Symposium on *Unlocking our Mission Systems Potential* (Rolling Meadows, IL)
* Terril Hurst, Chatterpaul Joseph, John Rhodes and Keith Vander Putten, “Novel Experimental Design & Analysis Methods for Simulation Experiments Involving Algorithms”, Proceedings, 2009 U.S. Army Conference on Applied Statistics (Cary, NC)
* Terril Hurst, Chatterpaul Joseph, Colin Pouchet, Brett Collins, “Designed Simulation Experiments, Part 2: DOE for the Digital Age”, Proceedings, 2011 American Institute of Aeronautics and Astronautics

## Education

**Stanford Center for Professional Development** · 9/17 – 5/18

* Design Thinking for Strategic Innovation: Empathize with our customer, synthesize our learnings, and rapidly prototype and test our new ideas. Tackle innovation challenges from start to finish and gain an in-depth understanding of these key tenets of design thinking and how to incorporate them into our work.
* Leading Innovation: Gaining a competitive advantage in today’s business environment increasingly demands that organizations know how to innovate. This course teaches how leaders foster a culture of innovation and provide skills needed as a leader and team-member.
* Power of Stories to Fuel Innovation: Stories fuel innovation, big ideas need a story and people to buy into it. They hold the power to transform listeners; to take listeners on a journey that changes how they think, feel or act; a good story that can be harnessed by social networks to virally spread its impact.

Master of Science in Electrical Engineering - University of Rhode Island · 2006

* Specialization stochastic signal processing in sonar application

Bachelor of Science in Computer Engineer - University of Rhode Island · 2003+

* Specialization in VHDL, FPGA, CPU, Compiler Design

Bachelor of Science in Electrical Engineer - University of Rhode Island · 2003+

* Specialization in Electronics and Control Systems

+Note that with extraordinary work ethic, I completed 2 Engineering Majors, 2 Minors – Math & Physics, and Reserved Officer Training Corps within 4 years.