RAUL SOSA

resume version 50

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MODEL BASED SYSTEMS ARCHITECT

Professional Summary

Experienced Systems Architect with a proven ability to lead complex, cross-disciplinary system development using SysML, SysMLv2, UML, DoDAF, and Unified Architecture Framework models. Expert at translating technical complexity into clear, data-backed insights that mitigate risk and align executive and technical teams. Strong track record of delivering innovative revenue-generating and cost-reduction projects ahead of schedule and under budget. Bilingual: English and Spanish.

Education

- B. S. in Mechanical Engineering
- Model-based Systems Engineering
- AI-Assisted Model-Based Systems Engineering
- Claude Code Agent Lab
- Unified Architecture Framework Certificate
- IPC-610 & 620 Certificate
- Lean Six Sigma Green Belt Certificate
- Zuken Certificate
- Root Cause Analysis Certificate

DOD Clearance Level

- Top Secret with ability to obtain SCI

Technical Skills & Tool Experience Summary

Software

- AutoCAD, ANSYS, Creo/Pro-E, NX, Solidworks
- Cameo Enterprise Architecture
- Confluence
- DOORS
- Git
- Jira
- LabView
- Microsoft: Excel, Outlook, PowerPoint, Project, Word
- Putty
- SAP – MRP System
- Teamwork Cloud
- VMware Workstation
- Zuken

Programming

- G & N Code
- MATLAB
- VBA

Computer Systems

- Linux
- Windows

Test Equipment

- Function Generator
- High Voltage Test Set
- Multi-Meter
- Network Analyzer
- Oscilloscope
- Power Meter
- Signal Generator
- Spectrum Analyzer

Other Skills

- 3D Printing
- CNC Machining
- Electrical-Mechanical Equipment Troubleshoot
- Electrical Schematic Drafting
- ESD Safety Trained
- Finite Element Analysis (FEA)
- FOD Trained
- Manufacturing Jig Aid Design
- Statistical Process Control (SPC)
- Script Programming for Routine Automation

Professional Experience

- **Model Based Systems Architect**
  Bowhead – UIC Alaska Native Corporation | Nov 2024 – Present
  Lead enterprise UAF modeling to enable leadership-level analysis, strategic reporting, and data-driven decision-making. Apply Model-Based Systems Engineering (MBSE) principles to design secure, scalable, and interoperable IT architectures across hybrid, cloud, and on-premise environments.
  - **AI/ML integration within MBSE frameworks** - Built phone-enabled OOSEM MBSE Consultant bot that is available 24/7 and allows users to contribute to a project asynchronously.
  - **MBSE Customization (Plugins/APIs):** ability to extend MBSE tool capabilities through scripting, APIs, or custom plugins.
  - **Enterprise Process Modeling** – Captured and mapped business processes across departments, creating enterprise-level Unified Architecture Framework model, for performance analysis and optimization.
  - **Executive Reporting & Decision Support** – Translated complex system and process data into actionable insights for leadership, influencing investment, resource allocation, and modernization strategies.
  - **Architectural Design & Optimization** – Modeled and refined network architectures to align with business objectives, security requirements, and long-term scalability goals.
  - **Concept & Solution Validation** – Tested new and proposed ideas and solutions against enterprise-wide requirements, applying a holistic systems perspective and incorporating feedback from cross-discipline stakeholders to ensure optimal fit and long-term viability.
  - **Systems Modeling & Digital Twin** – Leveraged Cameo, UAF and SysML to simulate performance, assess dependencies, and validate design choices.
  - **Requirements Traceability** – Applied MBSE frameworks to align enterprise requirements with organizational strategy.
  - **Integration & Interoperability** – Modeled interfaces to ensure seamless system integration across cloud, on-premise, and hybrid environments.
  - **Cybersecurity Engineering** – Designed Zero Trust–aligned security architectures to assess risks and ensure compliance.
  - **Automation & Infrastructure-as-Code (IaC)** – Integrated MBSE with DevSecOps workflows for automated deployments and lifecycle management.
  - **Stakeholder Engagement** – Delivered clear, visual models that improved collaboration between business, IT, and security teams.

- **Model-Based Systems Engineer – Radar Systems**
  Northrop Grumman Corporation | Dec 2021 – Nov 2024
  Led MBSE initiatives for radar systems, applying SysML-based architecture development, requirements management, and stakeholder engagement to ensure mission readiness and technical excellence.
  - **Automated Document & Deliverable Generation** - automated generation of technical documentation, reports, and deliverables directly from architecture models using Cameo Report Wizard Velocity templates.
  - **Requirements Management & Traceability** – Managed system requirements in Cameo and DOORS, improving version control efficiency through process enhancements; performed allocation, derivation, RVTM development, and verification activities.
  - **Architecture & CONOPS Development** – Applied MBSE SysML approaches to define Black Box and White Box boundaries, develop Interface Control Documents (ICDs), and establish sub-system level interface definitions.
  - **Concept of Operations (CONOPS) Definition** – Created system-level operational concepts and modeled workflows to align technical design with mission objectives.
  - **Stakeholder Communication & Technical Reviews** – Supported TRB, CCB, SRR, PDR, CDR, and other SE processes, providing clear system models and visual storytelling tools to drive stakeholder alignment.
  - **AI-Enhanced Requirements Analysis** – Leveraged AI tools to identify requirement gaps, improve clarity, and reduce risk in early development stages.
  - **System Engineering Process Improvement** – Introduced structured modeling approaches that enhanced collaboration between engineering disciplines and accelerated decision-making timelines.

- **Integration & Test Systems Engineer – Radar Systems**
  Northrop Grumman Corporation | Dec 2021 – Oct 2022
  Supported integration and testing of radar systems, ensuring design compliance, operational readiness, and data accuracy across engineering disciplines.
    - **Test Planning & Execution** – Developed and maintained integration/test plans; executed testing, captured results, and documented findings for review.
    - **Technical Collaboration** – Partnered with hardware and software SMEs to ensure test results aligned with design specifications and performance goals.
    - **Lab & Equipment Management** – Configured and troubleshot RF lab equipment, including network analyzers, oscilloscopes, and signal generators; ensured proper power, computing, safety, and environmental controls.
    - **Fixture & Tooling Desig**n – Researched, designed, and documented fixture assemblies to support complex testing requirements.
    - **Documentation & Compliance** – Reviewed system specifications, test documentation, network configuration files, and memory volatility reports, providing feedback for compliance and quality.
    - **System Integration Support** – Coordinated with lab management and IT infrastructure teams to ensure availability and readiness of required resources for testing.

- **Manufacturing Process Engineer**
  Northrop Grumman Corporation | May 2017 – Dec 2021
  Drove manufacturing process optimization and digital transformation initiatives for electronics assembly, delivering significant efficiency gains, cost savings, and quality improvements.
    - **Cybersecurity Implementation** – Applied vulnerability patches to off-network standalone computer systems, ensuring compliance with evolving cybersecurity requirements.
    - **Digital Transformation** – Integrated Augmented Reality technology into manufacturing workflows, enhancing training and assembly accuracy.
    - **Root Cause & Corrective Action (RCCA)** – Led investigations for Corrective Action Requests (CARs), implementing solutions that reduced recurring defects.
    - **Manufacturing Tooling & Fixture Design** – Designed heavy-equipment fixture assemblies, improving operator safety and assembly precision.
    - **Process Efficiency Improvements** – Achieved a **750% efficiency gain** on Base Drive capacitor replacement, delivering a **1-day ROI**.
    - **Wire Processing Automation** – Developed preventative maintenance plans, standardized work instructions, and integrated automatic wire processing equipment; achieved a **400% productivity boost** and saved **$340K in 3 months**.
    - **Automated Testing Systems** – Installed and configured Cirris CR automatic circuit testers; developed Zuken-based interconnect diagrams and VBA tools for data import, resulting in a **420% efficiency gain** and **$150K savings**.
    - **Lean Manufacturing** – Deployed shadow board tool management systems, reducing search time and improving workspace organization (ROI in 1 week).
    - **Training & Knowledge Transfer** – Created technical documentation and delivered hands-on training for floor personnel, ensuring sustainable adoption of new processes and tools.

- **Manufacturing Project Engineer**
  NABCO Systems, LLC | Jul 2016 – May 2017
  Delivered manufacturing process improvements and equipment optimization for specialized blast containment systems, enhancing efficiency, reliability, and production throughput.
    - **Process Optimization** – Increased manufacturing efficiency by **100%** through custom programming of the CNC plasma cutter, reducing production time and material waste.
    - **Electro-Mechanical Troubleshooting** – Diagnosed and repaired welding equipment, including PLC-controlled and hydraulic systems, minimizing downtime and extending equipment life.
    - **Metal Fabrication Engineering** – Applied expertise in welding engineering, machining, rolling, and CNC plasma cutting to support the production of high-tolerance components.

- **Programming & Automation** – Developed and optimized G-code and N-code programs to ensure precision in automated cutting and machining processes.
- **Cross-Functional Collaboration** – Partnered with design, production, and QA teams to address manufacturing challenges and maintain compliance with engineering specifications.

- **Design & Technical Sales Engineer**
  Trito-Agro Industrial Services, Inc. | Dec 2015 – Jul 2016
  Combined engineering design and B2B sales expertise to deliver custom agricultural and industrial solutions.
  - **Product Design** – Engineered a hydraulic material shredder tailored to client specifications.
  - **Business Development** – Managed B2B sales for bokashi composting systems and compost products, building client relationships and expanding market reach.
  - **Technical Support** – Provided end-to-end product demonstrations and technical guidance to ensure customer satisfaction.

- **Medical Devices Sales & Product Development Agent**
  RMc Orthopedic & Surgical Inc. | Feb 2015 – Dec 2015
  Provided sales, product development, and technical support for advanced orthopedic medical devices.
  - **Sales & Client Relations** – Sold knee, hip, and arthroscopy devices to surgeons and healthcare providers.
  - **Technical Training** – Guided surgeons and operating room staff on device usage, ensuring safe and effective application.
  - **Certification** – Earned medical sales certification to support technical credibility and compliance in regulated healthcare environments.