

MODEL BASED SYSTEMS ENGINEERING ENTERPRISE ARCHITECT

Professional Summary

Experienced Systems Architect with proven ability to decompose, communicate, and lead complex, cross-discipline projects and systems into practical SysML, SysMLv2, and UAF models that provides clarity to technical teams, and provides data-backed insights to reduce risk for executive teams to make architectural and data-driven decisions. Ensures clear translation of technical complexity, stakeholder requirements, and business requirements, into clear, data-backed insights, that promotes stakeholder buy-in across all organizational levels. Proven track record of delivering cost-cutting, innovative projects that surpass time and budget expectations. Bilingual (English/Spanish).

Education - Degrees and Certifications

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

DOD Clearance Level

- Top Secret

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

- **Enterprise Model-Based Systems Engineering Architect**

Bowhead – UIC Alaska Native Corporation | Nov 2024 – Present

Lead enterprise 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.

- **Enterprise Process Modeling** – Captured and mapped business processes across departments, creating enterprise-level models 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.

- **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 troubleshoot RF lab equipment, including network analyzers, oscilloscopes, and signal generators; ensured proper power, computing, safety, and environmental controls.
 - **Fixture & Tooling Design** – 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 – Electronics Assembly & Manufacturing**
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 – Blast Containment Vessel Manufacturing**
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.

- **Product Development & 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.

** Please see the next pages for degrees and certifications

SSI



Certificate of Completion

Is hereby granted to

Raul Sosa-Chang

Robb Illich

to certify completion of SSI's Unified Architecture Framework (UAF) course provided April 27 through May 1, 2026. Completion includes attendance, group modeling participation, and passing the provided UAF knowledge exam

A handwritten signature in black ink, appearing to read 'Matthew Hause', written over a horizontal line.

MATTHEW HAUSE
PRINCIPAL SYSTEMS ENGINEER
UAF EXPERT INSTRUCTOR

California Institute of Technology
Center for Technology and Management Education

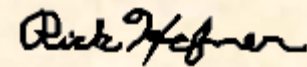
This is to certify that

Raul Sosa

has successfully completed the

**Model-Based Systems Engineering
Certificate Program**

At Northrop Grumman Corporation



Rick Hefner
Executive Director
Center for Technology and Management Education
California Institute of Technology
March, 28, 2022

Caltech

**Center for Technology &
Management Education**

California Institute of Technology

Center for Technology and Management Education

Upon recommendation of the Center has conferred on

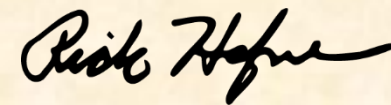
Raul Sosa

a certificate in

AI-Assisted Model-Based Systems Engineering

In recognition of the satisfactory completion of a prescribed program
of learning from the Caltech Division of Engineering and Applied
Science in the City of Pasadena, in the State of California,
on February 28, 2026.

Caltech



Dr. Rick Hefner
Executive Director, Caltech CTME

California Institute of Technology

Raul Sosa

Has earned a Certificate of Completion in

Claude Code Agent Lab

Caltech Center for Technology and Management Education
March 28, 2026



Dr. Rick Hefner
Executive Director
Caltech CTME

Caltech Center for Technology &
Management Education





THE BOARD OF TRUSTEES OF THE UNIVERSITY
UPON RECOMMENDATION OF THE FACULTY
HEREBY CONFERS UPON

Raúl Sosa Chang

THE DEGREE OF

Bachelor of Science in Mechanical Engineering

IN RECOGNITION OF THE COMPLETION OF THE PRESCRIBED
PROGRAM OF STUDY WITH ALL THE HONORS,
RIGHTS AND PRIVILEGES THERETO APPERTAINING.
GIVEN UNDER THE SEAL OF THE UNIVERSITY AT
San Juan, Puerto Rico, this thirtieth day of June, 2015.

CHAIRMAN OF THE BOARD OF TRUSTEES

PRESIDENT OF THE UNIVERSITY