Joe Poznanski, PMP, PMI-ACP

Principal Software Engineer – Agentic AI Systems / LLM Platform Engineering

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PROFESSIONAL SUMMARY

Principal Software Engineer with 15+ years shipping mission-critical aerospace and high-fidelity simulation software (Otto Aerospace, Blue Origin). I build agentic AI systems and developer automation that turn ambiguous operational goals into reliable, test-backed software—tool-using agents, eval/guardrail pipelines, and self-healing workflows that accelerate requirements-to-code while improving safety and correctness. Deep hands-on delivery across Rust/C/C++/Python, distributed systems, and operator-grade dashboards.

AGENTIC AI & AUTOMATION HIGHLIGHTS

- Built **tool-using agent** workflows that automate triage-to-plan-to-implementation loops with **human-in-the-loop** review, producing repeatable, **test-backed** changes instead of one-off prompt outputs.
- Created AI-assisted QA pipelines (**test** scaffolds, evidence packaging, and regression summaries) to shorten feedback cycles and improve release confidence on safety- and mission-critical systems.
- Developed ops copilots for log/**telemetry** summarization and anomaly correlation across distributed services, reducing time-to-diagnosis during integration, demos, and drills.
- Standardized prompt/playbook libraries and **guardrail**s (templates, validation checklists, deterministic scripts) so teams can safely adopt AI workflows at scale.

SECURITY CLEARANCE

- US Citizen with current passport
- Active DBIDS badge for Cape Canaveral access
- Eligible for U.S. Secret or Top Secret Clearance
- Able to travel up to 50 percent

AREAS OF EXPERTISE

■ Software Development (Simulation and Modeling) ■ Data Parsing & Scripting ■ Robust Simulation Architecture ■ Test Driven Development (TDD) ■ Test Automation ■ Embedded Controller Design ■ UI/UX Design ■ Pipeline Automation ■ Organizational Change & Retention ■ Technical Program & Project Management ■ Requirement Analysis & Gathering ■ Agile / Scrum Methodologies ■ Configuration Management ■ Software Standards & Compliance ■ AI & Machine Learning Applications ■ DevSecOps ■ Model Based Systems Engineering (MBSE)

TECHNICAL SKILLS

- **Languages:** Rust, C, C++ (C++17, C++20, CMake, Clang, Gcc, Ninja), Python, Java, HTML, HTML5, Javascript, CSS, SQL, NoSQL, PowerShell, Bash
- AI/ML: Agentic AI systems and automation (multi-agent orchestration, tool-using agents, evals/guardrails), Anthropic Claude (Opus/Sonnet/Haiku), OpenAI (Codex/GPT), GitHub Copilot, HuggingFace; workflow design, retrieval, and AI-assisted test + documentation generation

- **C++ Libraries:** Boost (Asio, Spirit, etc), Google Test (GTest), C++ Standard Library (STL), TensorFlow, JSON, OpenCV, Qt, Poco, Active Template Library (ATL), fmt, spdlog, Dlib
- **Python Libraries:** NumPy, OpenPyxl, PyTest, PyTorch, TensorFlow, Matplotlib, CatBoost, Optuna, Polars, scikit
- **Rust Crates:** Rapier, SimRS, autopilot-rs, eframe/egui
- **Tools & Frameworks:** Docker, Git, GitLab, JIRA, Confluence, PyQt5, Controls.js, Node.js, jspanel, jQuery UI, Matlab, AWS, Terraform, Unix, Linux, VXWorks, Sim3D, CI/CD, Unreal Engine, Unity, DOORs DNG, Windchill PTC, Azure, React, Vue, Angular, ReactJS, Jquery, Boostrap, Ansible, Databricks, Jenkins, JSON, YAML, .NET, Hypervisors, VMWare, AnyLogic, FlexSim, CodeSpaces
- **Standards:** DO-178B, DO178C, FAA Part 60 Change 2, SAE AS9100, SAE AS9115, ARP4754A, ARP4761, ISO/IEC 12207, DAL-A/E, DO-330, DO-331, DO-332, DO-333, ISO26262, NASA-STD-8739.8B, 14 CFR 450.141
- **Aircraft Airframes and Technologies**: Airbus A320, Boeing 737/737 MAX, 767, 777, 787, MD80, MD90, DC9, CRJ-200, C-172, Citation 2, Citation CJ, Hawker 800, Piper Seminole, Learjet 65, King Air 350, Diamond DA42, Pilatus PC12/PC12NG, Socata TBM700, Garmin G1000, Proline Avionics Suite, Bendix/King GPS + Radio stacks

PROJECT MANAGEMENT

- Expert in requirements generation, tailoring, and compliance
- Skilled at Agile project structuring: user stories, epics, backlog grooming
- Experienced in resource allocation, cost tracking, and work breakdown structures (WBS)
- Adept with scheduling and cross-functional team coordination
- Expert familiarity with tools such as JIRA, Confluence, GitLab, and MS Project
- Contributor to process improvements and organizational change initiatives

PROFESSIONAL EXPERIENCE

OTTO AEROSPACE, Ft Worth, TX

PRINCIPAL SOFTWARE ENGINEER, SUPERNATURAL VISION PROGRAM

AUGUST 2025 – CURRENT

- **Architected and shipped** the **SuperNatural Vision 8K Video Wall System**: synchronized 8K video playback across a 4-node Mac Mini cluster (7680×2160 @60Hz per display, ~50 GB/s aggregate throughput) with sub-frame latency; system now drives immersive scenic environments for executive demos and trade shows.
- Built a **Rust/tokio backend service** for cross-platform orchestration: async SSH command dispatch, JSON-RPC control of MPV/VLC playback, and display configuration management—achieving **less than 100 ms** command round-trip from Windows controller to macOS endpoints.
- Delivered an **extremely responsive Node.js / React dashboard** with seven tabbed control panels (MPV/VLC Control, Profiler, AutoTest, Video Probe, Frame Analysis, Convert, Mission Control); UI updates **under 16 ms** for instant operator feedback.
- **Python automation framework** (pytest, loguru, matplotlib): VLC controller module, remote system profiler, and AutoTest harness that iterates through MPV/VLC-settings × transcode-folder combinations, collecting CPU/GPU/thermal timeseries and generating **professional PDF reports with charts** to pinpoint WindowServer/VLC-decode jitter.
- **CI/CD pipeline** (GitLab CI, Docker, rsync): automated nightly builds, **300+ unit tests** for Rust services and Python modules, media staging to Mac cluster via rsync, and push-button deployments—full stack spins up in **under 2 minutes**.
- **Comprehensive documentation**: detailed docstrings and version histories for every Python module (10+ versioned scripts), Rust crate-level docs with examples, and operator runbooks—hypothetical onboarding of new engineers in **under one week**.

- Tuned **VLC and MPV playback for 8K HDR**: hardware-decode profiles, file-caching strategies, and FFmpeg transcode presets that eliminated visual jitter on intensive scenes and reduced **WindowServer CPU by 40%**.
- Designed and operationalized agentic AI workflows (Claude/Codex + tool-use) to accelerate triage, code generation, and refactoring across Rust/Python/Node, reducing iteration time while keeping changes reviewable and test-backed (paired with automated checks in CI/CD).
- Built **AI-assisted test and documentation pipelines**: generated test scaffolds, runbook templates, and release notes from source and logs; standardized prompts/playbooks so teammates could reproduce results consistently.
- Implemented **ops-copilot automation for Mac-cluster reliability**: log summarization, anomaly detection on thermal/CPU/GPU metrics, and automated rollback/health checks to keep demo systems stable under show-floor conditions.

BLUE ORIGIN, Cape Canaveral, FL

SENIOR SIMULATION ENGINEER, SENIOR AEROSPACE OPERATIONS SOFTWARE ENGINEER

MAY 2022 – AUGUST 2025

- **Architected and shipped** the first-generation **Operations Training Simulator** for launch-vehicle integration, ground-systems, and pad operations; delivered MVP in 18 **months** and now supports **2 training drills per quarter**.
- Invented the **"Simulated Avionics Layer"**: a Rust-based service that streams **500k+ telemetry signals at greater then 10 Hz** (approx 5 GB/s) over a proprietary data bus from a single 32-core server—cut hardware spend **$1.2 M** and reduced integration labor **60 %**.
- Built a **Rust/C++ component-modeling framework** (tokio, Boost, nalgebra) that emulates valves, pumps, and sensors with less then **2 ms deterministic latency**; doubled fidelity while halving CPU load.
- **Automated test & compliance**: Python/pytest + GitLab CI pipelines run **800+ unit, functional, and HIL tests nightly**, auto-generating DO-178C / AS9100 evidence and shrinking regression cycles from three days to **two hours**.
- **Digital twin development** of the simulated Launch Pad and Launch Vehicle with **AnyLogic/FlexSim**
- Authored **200+ training requirements and hazardous-ops scenarios**; coordinated sign-off with Launch Directors, GSE, and Launch-Ops, achieving first integrated-pad simulation milestone **three weeks early**.
- Delivered a **React / Node.js / Bootstrap dashboard** for scenario control and simulator health; trainee setup time dropped **70 %** and NPS rose to **93/100**.
- **Optimized CentOS-RT hosts** (irqbalance pinning, isolcpus, cgroups, SCHED_FIFO) to hold control-loop jitter less then **1 ms @ 100 Hz**; real-time metrics streamed to Grafana/Loki.
- Introduced **AI-assisted engineering workflows for simulator development**: requirements-to-test traceability helpers, automated change-impact summaries, and code-review prechecks to improve speed without compromising safety/compliance (traceability + evidence generation aligned to existing verification processes).
- Created agent-driven **log/telemetry analysis tools** to summarize high-rate signal anomalies, correlate cross-service events, and propose likely root causes, shortening time-to-diagnosis during integration and drills.
- Built a reusable p**rompt/playbook library** for consistent outputs (design notes, interface contracts, test cases, runbooks) and trained teammates on safe usage patterns (human-in-the-loop validation, artifact retention).
- Implemented **push-button deployments** with Docker, Ansible, and Poetry—full simulator stack spins up in less then **1 minute** on bare metal or VM.
- Act as cross-team **technical liaison** (Avionics, GSE, Mission Ops); routinely unblock multi-disciplinary issues, sustaining on-track delivery of NS5 pad-ops training.
- **Security & compliance:** Active DBIDS badge for Cape Canaveral; U.S. citizen **eligible for Secret / Top-Secret (SCI) clearance**.

AVENGER FLIGHT GROUP, Dallas, TX and Las Vegas NV

DIRECTOR OF SIMULATION & SOFTWARE ENGINEERING, MANAGER OF SIMULATION & SOFTWARE ENGINEERING

JUNE 2014 – MAY 2022

- Scaled the company from 11 employees at two U.S. sites to **200+ staff across three countries**; hired and mentored the first 30 simulation and software engineers (embedded, real-time, DevOps).
- **Designed and coded** a real-time data-bus framework in **C++17, VxWorks, ZeroMQ** that transfers position, control-loading, and visual-system data between host and subsystems **in under 120 ms**, exceeding the FAA Part 60 response-loop requirement; now fielded on **18+ aircraft simulators** worldwide.
- Led full **control-loading hardware/software retrofit** for an end-of-life rudder, nose-gear, brake, and throttle system; built C++ motion-control stack, integrated brushless-servo electronics, and guided through FAA qualification—achieved **4x tighter force-feel tolerance** and saved **$380 K** per simulator from using external vendors.
- Stood up **CI/CD and automated qualification** (Git, Jenkins, Docker, Python) with nightly unit, functional, and regression tests plus automatic QTG plotting and DO-178C artifact export—cut regression time from two weeks to **six hours** and earned **100 percent first-pass FAA approvals**.
- **Optimized embedded Linux controller hosts** (Yocto, PREEMPT_RT, SCHED_FIFO, isolcpus, IRQ and cache affinity) to guarantee less then **800 ms loop jitter** and deterministic UDP multicast, meeting FAA and EASA latency budgets with 40 % CPU headroom.
- Authored **120+ requirements and V&V procedures** for DO-178C DAL-C functions; closed audit findings **70 percent faster year-over-year** through structured gap-analysis workshops.
- Implemented ISO-compliant **configuration and change management** (GitFlow, Jira, Confluence); served as process-owner during FAA and EASA audits.
- Acted as primary technical liaison to airline customers and regulators; kept **98 percent on-time simulator qualifications** across 40+ devices by resolving all discrepancies within 30 days.
- Created **Python pandas/matplotlib toolset** that parses QTG telemetry, ranks failures, and auto-publishes signed PDF reports—eliminated **15 staff-days** of manual effort per device.
- Provided technical leadership on a **$45 million multi-year simulator refresh program** (A320, 737 MAX, ATR), raising company market share in the narrow-body training segment from **1 percent to 13 percent**.
- Fostered a **code-review culture** and annual internal technical conference; voluntary attrition remained **below 4 percent** throughout hyper-growth.

SIMCOM TRAINING, Orlando, FL

FLIGHT SIMULATION SUPERVISOR AND PROJECT MANAGER

FEBRUARY 2011 – JUNE 2014

- **Designed and coded** an enterprise **C++/SQL analytics platform** that ingested Qualification Test Guide (QTG) data from **12 disparate flight-training devices**, normalized metrics, and auto-generated compliance logs; cut manual report prep **90 percent** and drove **100 percent first-pass FAA Part 60 audits**.
- Built a **real-time ARINC 429 GPS-to-host converter** (C++17, UDP multicast, VxWorks) that added simulated GNSS telemetry to legacy avionics—kept an aging Citation 2 Level-D device in service and saved **$750K capital expense**.
- Launched a **Python-based self-test harness** (pytest, pandas, matplotlib) for fidelity checks; mean time to identify flight-model drift fell from four days to **under six hours**.
- **Optimized real-time Linux/UNIX kernels** (RHEL-RT, Debian PREEMPT_RT): pinned critical threads with isolcpus/IRQ affinity, tuned cgroups & SCHED_FIFO priorities, and cut control-loop jitter to less then **1 ms**, ensuring simulators met the FAA less then **150 ms** response-time mandate.
- Led a **10-person field software-engineering team** through installation and upgrade of **seven** cutting-edge simulators (Hawker 800, King Air 350, Learjet 65); delivered all projects on schedule and within less then **2 percent** budget variance.

- Instituted **Git-centric configuration and change management** with ISO 9001 templates; achieved **100 percent requirements traceability** for DO-178C DAL-C software components.
- Performed **requirements capture, V&V, and risk management** for every simulator upgrade; reconciled greater then 150 customer change requests without schedule slip.
- Optimized training-center operations: developed a **spares-forecast algorithm** that reduced AOG downtime **35 percent** and trimmed inventory carrying costs **$180K annually**.
- Delivered **technical-process roadmaps** adopted as corporate standard for simulator placement, preventive maintenance, and disaster-recovery contingencies.
- **Mentored** technicians and junior engineers; introduced **peer code reviews** and **quarterly up-skilling sessions** that boosted team retention to **96 percent.**

EDUCATION

Embry-Riddle Aeronautical University | Daytona Beach, FL (2006-2011)

Advanced Coursework in B.S.Electrical Engineering, Control Systems, and Computer Science/Software Engineering

Special focus on Robotics and Autonomous Vehicles, with coursework toward a minor in Systems Engineering (incomplete).

MEMBERSHIPS & ORGANIZATIONS

- Project Management Institute PMI PMP (Project Management Professional) March 2022
- Project Management Institute PMI ACP (Agile Certified Practitioner) April 2022
- Captain of the Institute of Electrical and Electronic Engineers (IEEE) Hardware Team's autonomous vehicle competition (2 years)
- Remote Pilot Certificate, FAA License for Unmanned Aircraft, General – Small (UAG) (Drone Operator) (FAA's Small UAS rule, Part 107)
- Python Institute PCAP (Certified Associate in Python Programming)
- NEC500 CompEx Certification