

ERIK NORRIS

Staff Mechanical Engineer | Robotics · Prototype → Production

// STRUCTURE THE CHAOS · INDEX THE DECISIONS · SHIP THE HARDWARE

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PROFESSIONAL SUMMARY

I treat physical engineering with the forensic rigor of a software codebase. The difference between a rescued program and a failed one is rarely the capability of the engineer - it is almost always the fidelity of the record.

I lead mechanical design for actuated systems that survive contact with the real world: a cobotic food-assembly platform coordinating 70+ actuators at $\pm 2\%$ portion precision and 350 meals/hour; a disc-changer mechanism whose 100% field-failure mode I traced through 3,000,000+ logged cycle events to a friction-coefficient drift; a head-mounted display whose spring-steel headband I carried through clamp-force characterization and lifecycle validation into mass production. I take subsystems from whiteboard through DVT into high-volume production, and I go to the factory floor - Suzhou, Guadalajara - when the yield data demands it.

Forty-plus commercial products, no git reset. The same forensic methodology I apply to a tolerance stack or a thermal yield crisis, I now apply to intelligent systems: I build and operate a local AI-agent infrastructure, engineering constraint structures for software the way I fence failure modes in hardware.

CORE COMPETENCIES

ENGINEERING

- Robotic Mechanism & Actuator Design
- Tolerance / Alignment / Load Paths
- Wear & Failure-Mode Analysis (RCA)
- GD&T · Stack-Ups (WC / RSS)
- DOE Test-Method Design
- FEA-Correlated Validation (ANSYS)
- Haptic & Kinematic Tuning

MANUFACTURING

- DFM / DFA for Automated Assembly
- High-Volume NPI (Tool Start → MP)
- Injection Molding · Die Casting · Sheet Metal
- Accelerated Life / Destruction Testing
- Yield Recovery & CAPA
- CM Management (Suzhou · Guadalajara · Taipei)

TOOLS & REGULATORY

- Onshape, Creo, Solidworks
- PLM Architecture (Agile / Arena / Windchill)
- Thermal Simulation (CFD)
- UL 1472 / UL 20 / FCC
- MIL-STD-1472G
- Class III Medical Standards
- Class-A Surfacing

PROFESSIONAL EXPERIENCE

MECHANISTIC | Principal Mechanical Architect

2022 - Present

| Consultancy: systems architecture, crisis recovery, and AI-augmented engineering operations.

- Conduct pre-production forensic audits for hardware startups - stress-testing thermal management, tolerance stack-up, and supply-chain fragility before tooling commitment.
- Built and operate **EN-OS**, a locally-hosted AI-agent infrastructure for research, root-cause synthesis, and decision documentation - the constraint methodology is identical to physical-systems engineering: fence the failure modes before assembly.

HYPHEN | Staff Mechanical Engineer → Principal Systems Architect

2021 - 2022

| Lead mechanical architect, Augmented Makeline - cobotic food-assembly robotics deployed with enterprise partners. Co-inventor, US20240164588A1. Recalled under contract three times since.

- Architected the gravimetric dispenser library (**Types A-F**) with de-agglomeration logic for adversarial ingredients (shredded proteins, sticky rice) - portion variance cut from industry-standard $\pm 15\%$ to $\pm 2\%$, food waste down **98%**, at **350 meals/hour** sustained and **99.9% order accuracy**.
- Integrated **70+ actuators** with the controls stack (Beckhoff C6030 IPC, TwinCAT 3 / EtherCAT) at millisecond precision; TwinSAFE zone passivation cut safety wiring by $\sim 50\%$.
- Resolved axial helix migration in the dispenser gear train - CTE mismatch between Acetal gears and Aluminum enclosures - with sleeve alignment guides and low-clearance retaining rings.
- Engineered **hot-swap blade architecture (MTTR under 5 minutes)** and a 15-minute tool-less sanitation breakdown (push-to-unlock hoppers) for NSF compliance in the IP69K washdown environment.

MECHANISTIC | Senior Mechanical Designer

2018 - 2021

| Product-development consultancy: micromobility, connected devices, lighting.

- Engineered a ruggedized IoT module for **Lyft's Bay Wheels eBike** fleet - system architecture through detailed part design for outdoor deployment - plus an eCargo-bike platform, concept through detail design.

NOON HOME | Head of Mechanical Engineering

2017 - 2018

| Multi-SKU smart-home lighting ecosystem - four hardware platforms, concept through EVT/DVT. UL 1472 / UL 20 / MIL-STD-1472G. Acquired by Savant Systems.

- Resolved dual EVT1 failure modes on the flagship Director switch: OLED delamination at 45°C from CTE mismatch (flex-mount PSA bracket) and a rotary interface below the 150g tactile threshold (pre-loaded spring detent restoring the **250g signature click**; passed 85°C storage qualification).
- Built **WC/RSS tolerance stack-up models** guaranteeing mechanical retention and 0.1mm gap reveal across mass EVT2 builds of a screwless multi-gang wall-plate chassis.
- Recovered **100% EVT2 yield** on the extension switch by isolating a 0.1mm CAD geometry mismatch; pivoted PSA to structural adhesive and drove steel-tooling modifications.

AVEGANT | Senior Mechanical Engineer - NPI / DFM / MP

2015 - 2017

| *Avegant Glyph - award-winning VRD head-mounted display, late-EVT through mass production. Best of CES 2016.*

- Resolved headband clamping-force and fatigue failure: measured spring-rate curves across **wire-diameter and liner-durometer variants**, qualified a second spring vendor, and validated the fix through **headband lifecycle testing** into mass production.
- Reversed optical-engine yield collapse from **35.4% to 77.9% RTY** in a 10-week sprint - cleanroom protocol plus 04/07 DMD inspection stations.
- On-site at Intretech (Suzhou): diagnosed magnesium chassis warpage and deployed Go/No-Go fixtures - casting yield from under 60% to over 95%; drove **T1-T6 tooling revisions** resolving telescoping ear-can cable kinking (40% failure at 250 cycles).
- Delivered magnesium castings, injection-molded plastics, soft goods, and packaging on a **234-day Tool Start → MP** schedule.

KALEIDESCAPE | Senior Mechanical Design Engineer

2008 - 2015

| *Sole ME for six generations of premium home-cinema hardware - NPI through sustaining across a Taiwan / Mexico / Canada supply chain.*

- Eliminated a **100% field-failure population** in the M700 disc changer: analyzed **3,000,000+ cycle events** to isolate friction-coefficient drift in the pinch roller; redesigned with dual radial spring balance bars; recovered questioned carousel inventory via revised inspection criteria - **zero scrap**.
- Cleared an M500 **stop-ship** (resistors shearing off the PCB under handling load) by tracing sheet-metal flexure into the PCBA load path and designing a retrofit structural tray - no inventory scrapped.
- Directed manufacturing transfer to Sanmina Guadalajara; eliminated a 15% rework rate caused by a **0.005 in fan-tray tolerance stack-up** by re-dimensioning the sheet metal.

DIGIDESIGN (AVID) | Lead Mechanical Engineer

2003 - 2008

| *Flagship audio control surfaces - C|24, D-Command, SC48, ICON, 003; 12+ products shipped.*

- Integrated **19 distinct PCBs** (C|24) and 17 (SC48) under Data Control Drawings governing outlines, keep-outs, and connector placement - **100% mechanical fit on initial physical builds**.
- Resolved SC48 CPU thermal shutdown with a **16-configuration DOE matrix** (chassis volume × fan size × voltage) defining the Safe Operating Area - internal rise stabilized at 22.6°C with 13.8°C of headroom.

EARLIER WORK | Consumer · Medical · Workstation Hardware

1986 - 2003

| *WebTV / Microsoft (Xbox, UltimateTV; Galaxy set-top: 150W in consumer plastics via a 28.3 CFM wind-tunnel chassis) · frogdesign (KaVo dental systems, Newscorp satellite, Vadem Clio convertible PDA) · SGI (workstation thermal-acoustic analysis) · EP Technologies (Class III cardiac-ablation catheter production - where the forensic methodology started).*

EDUCATION

De Anza College

Associate's Degree, Automotive Engine Performance

RECOGNITION

- Patent US20240164588A1: Modular System for Food Assembly (co-inventor)
- Avegant Glyph: Best of CES 2016 (Senior Mechanical Engineer, NPI → MP)
- SC48 Venue Mix Rack: TEC Award, Sound Reinforcement Console Technology
- Kaleidescape Cinema One: CEPro Product of the Year
- Motorola MP3 Player: CES 2002 Design Honoree