

Armani Underwood

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SUMMARY

Senior autonomy systems engineer with 10 years of experience integrating hardware and software for production mobile systems, including 7 years focused on autonomous and advanced machine control platforms. Leads **system architecture**, L6 requirements decomposition, traceability, electrical integration, **functional testing**, validation, troubleshooting, and customer rollout for construction equipment. Hands on work includes cameras, Lidar, Radar, GNSS, IMU, CAN, Ethernet, ROS2, harnessing, wiring, embedded controllers, and base machine interfaces. Coordinates autonomy, embedded software, electrical, machine development, and validation teams through laboratory testing, machine demonstrations, readiness reviews, and field issue resolution. Communicates technical tradeoffs with evidence, mentors engineers, and establishes repeatable practices that support safe, production capable features across **wheel loaders**, excavators, and **articulated trucks**.

EXPERIENCE

Lead Autonomy Systems Engineer

January 2024 - Present

Frontier Machine Intelligence

Chicago, Illinois

Leads integration of autonomous construction machine features across perception, localization, vehicle networks, embedded controllers, and base machine interfaces. Guides requirements, architecture, validation, risk review, troubleshooting, and engineer mentoring through production focused development.

- Decomposed customer needs into L6 requirements with traceability across interfaces, tests, and release criteria.
- Integrated **cameras**, **Lidar**, Radar, GNSS, IMU, CAN, Ethernet, and ROS2 across machine platforms.
- Directed laboratory and machine issue triage, isolating sensor, network, electrical, software, and control faults.
- Communicated architecture tradeoffs, readiness, and **technical risk** through test evidence and decision criteria.
- Mentored systems engineers on requirements quality, interface documentation, **troubleshooting**, and **validation** planning.

Senior Systems Engineer

July 2021 - December 2023

Great Lakes Autonomous Equipment

Milwaukee, Wisconsin

Owned **systems engineering** for autonomous and operator assist features on off highway machines. Connected feature intent with subsystem requirements, interface definitions, integration events, production readiness, field demonstrations, and customer use scenarios.

- Translated feature intent into subsystem requirements for sensors, positioning hardware, networks, and controls.
- Planned integration and validation events with software, electrical, controls, and test teams.
- Diagnosed CAN, **Ethernet**, sensor, **GNSS**, and IMU faults through logs and controlled reproduction.
- Supported field demonstrations and production readiness reviews with documented risks and test coverage.
- Presented design alternatives using machine test evidence, system constraints, and customer use scenarios.

Systems Integration Engineer

June 2018 - June 2021

Prairie Robotics Mobility

Champaign, Illinois

Integrated sensing and control hardware for mobile automation programs, connecting prototype machines, laboratory rigs, vehicle networks, and ROS2 software. Prepared architecture records, verification procedures, test reports, and field evaluation materials for cross functional teams.

- Integrated cameras, ranging sensors, GNSS, **IMU**, and vehicle networks on mobile automation programs.
- Developed verification procedures for subsystem interfaces and functional behaviors tied to requirements.
- Supported **ROS2** integration with **CAN** and Ethernet connected devices in laboratory rigs and machines.
- Investigated electrical and communication faults through harness inspection, **wiring** diagrams, and bench testing.
- Prepared architecture diagrams, interface descriptions, test reports, and technical presentations for **engineering** teams.
- Supported field evaluations through configuration control, test preparation, data collection, and issue follow up.

Systems Engineer

June 2016 - May 2018

Midwest Heavy Equipment Labs

Moline, Illinois

Supported systems development for electronically controlled heavy equipment, including electrical systems, harnessing, controllers, CAN communications, prototype sensors, and machine testing. Built practical domain knowledge across wheel loaders, **excavators**, and **articulated trucks**.

- Supported electrical systems, **harnessing**, controllers, and CAN communications for heavy equipment.
- Converted feature descriptions into testable requirements and documented assumptions for engineering review.
- Executed bench and machine functional tests, capturing logs, measurements, and documented deviations.
- Integrated prototype sensors using approved wiring practices and verified power and communications interfaces.
- Maintained requirements, interface notes, test procedures, and results across development iterations.
- Supported wheel loader, excavator, and articulated truck engineering activities during machine development.

PROJECTS

Surface Loading Autonomy Integration 📅 2024

Integrated perception, localization, vehicle networks, embedded controllers, and base machine interfaces for autonomous construction machine features. Supported requirements traceability, functional testing, issue triage, readiness reviews, and machine demonstrations.

Heavy Equipment Sensor Validation 📅 2018

Validated cameras, ranging sensors, GNSS, IMU, CAN, and Ethernet interfaces on prototype machines. Combined bench testing, wiring inspection, network traces, and structured issue follow up.

LEADERSHIP & AWARDS

- INCOSE Certified Systems Engineering Professional recognition received in 2023.
- Autonomy Systems Engineering Mentor, guiding engineers on requirements, interfaces, troubleshooting, and validation since 2024.
- Selected as a technical mentor for practical autonomy integration and machine testing.

EDUCATION

Bachelor's Degree in Electrical Engineering

2016

University of Illinois Chicago GPA: 0.0

Chicago, Illinois

Coursework: Systems engineering, control systems, electrical circuits, computer engineering

CERTIFICATIONS

- INCOSE Certified Systems Engineering Professional 📅 2023
- ROS2 Integration Training 📅 2023

TECHNICAL SKILLS

- **Autonomy Sensors:** Cameras, Lidar, Radar, GNSS, IMU
- **Vehicle Networks:** CAN, Ethernet, ROS2
- **Electrical Integration:** Harnessing, wiring, power interfaces
- **Systems Engineering:** L6 requirements, traceability, architecture
- **Testing and Validation:** Functional testing, verification procedures, validation
- **Machine Platforms:** Wheel loaders, excavators, articulated trucks
- **Software Integration:** Embedded controllers, ROS2 nodes, interface testing
- **Systems Documentation:** Interface descriptions, architecture diagrams, test reports
- **Issue Resolution:** Issue triage, troubleshooting, fault isolation
- **Delivery Management:** Readiness reviews, field demonstrations, customer rollout

SKILLS

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|-----------------------|-----------------------------|-----------------------------|--------------------------|
| • Autonomous systems | • Requirements traceability | • Technical risk | • Electrical integration |
| • Systems engineering | • Functional testing | • Stakeholder communication | • Issue triage |
| • System architecture | • Validation | • Construction equipment | • Machine demonstrations |
| • L6 requirements | • Machine integration | • Sensor integration | |

PROFESSIONAL AFFILIATIONS

- INCOSE, systems engineering professional community member.
- Autonomy Systems Engineering Mentor, 2024 to Present.

LANGUAGES

- English (Native)
- Spanish (Intermediate)

ADDITIONAL INFORMATION

Work Status : Authorized to work in United States. No sponsorship required.

REFERENCES

AVAILABLE ON REQUEST