

Miguel Wiggins

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SUMMARY

Software engineering leader with 14 years of experience guiding **embedded controls**, **positioning** systems, **machine automation**, and **algorithm development** for industrial and off highway products. Leads multidisciplinary teams through strategy, requirements analysis, conceptual design, prototyping, verification, integration, commissioning, and production introduction. Combines hands on knowledge of GNSS, control systems, state estimation, diagnostics, data analysis, communications, and NPI with disciplined ownership of software quality, schedule, cost, and delivery risk. Builds traceability across functional and non functional requirements, design, testing, field issues, and releases. Coaches engineers through technical reviews, presentations, troubleshooting, and structured problem solving. Partners with product teams, suppliers, customers, and technical specialists to resolve difficult system issues and convert field needs into practical product decisions. Brings clear communication and sound engineering judgment to complex machine control programs.

EXPERIENCE

Software Engineering Manager, Machine Controls

March 2022 - Present

VectorGrade Technologies

Peoria, IL

Leads multidisciplinary engineers delivering positioning, machine control, and **commissioning** software across concurrent off highway product programs. Owns technical direction, lifecycle planning, requirements traceability, integration resolution, quality evidence, and engineer development.

- Led **GNSS** positioning and state estimation strategy across concurrent machine control product programs.
- Established requirements **traceability** linking functional needs, design evidence, verification results, field issues, and releases.
- Governed **NPI** schedules through **critical path** reviews, capacity planning, quality gates, and delivery risk decisions.
- Resolved sensor, **communications**, embedded software, and supplier integration issues through advanced diagnostic reviews.
- Coached engineers through design reviews, technical presentations, retrospectives, and structured problem solving.

Lead Controls Software Engineer

January 2019 - February 2022

IronPeak Automation

Champaign, IL

Led controls software delivery for automated mobile machinery using GNSS and complementary sensors. Managed work packages from requirements through **prototypes**, verification, release, and field issue resolution while mentoring engineers and coordinating product stakeholders.

- Led GNSS guidance software delivery for automated mobile machinery across **controls**, systems, test, and product teams.
- Developed estimation and control approaches from machine data, controlled tests, stability reviews, and edge case analysis.
- Converted **proof of concept** features into requirements, production plans, verification evidence, and release decisions.
- Diagnosed sensor, communications, timing, and control response failures through structured field and bench investigations.
- Mentored engineers on **requirements analysis**, design reviews, **troubleshooting**, technical communication, and stakeholder alignment.

Senior Embedded Controls Engineer

June 2015 - December 2018

Midwest Guidance Systems

Decatur, IL

Developed embedded control software for **construction** and agricultural machinery requiring precise sensor interpretation and actuator control. Supported conceptual design, **data analysis**, NPI, integration testing, defect resolution, and release preparation.

- Translated machine **use cases** into **functional requirements**, interfaces, software behavior, and testable acceptance criteria.
- Built machine log analysis workflows that isolated performance anomalies and clarified field failure causes.
- Supported NPI through **conceptual design**, prototypes, integration testing, defect resolution, and release preparation.
- Resolved multi vendor sensor, controller, and communications issues through structured diagnostics and corrective verification.
- Guided peer reviews and design discussions, strengthening requirements quality and failure prevention practices.

Controls Engineer

June 2012 - May 2015

Prairie State Motion Labs

Springfield, IL

Developed and tested control algorithms for electromechanical systems using feedback control, estimation, sensor processing, and embedded implementation. Supported prototypes, bench testing, integration, documentation, and design reviews with hardware and software specialists.

- Developed feedback control and estimation algorithms for electromechanical systems using embedded implementation methods.
- Created prototype software and bench tests that evaluated control concepts before broader **product development**.
- Analyzed operational data to characterize response, isolate defects, and document **engineering** findings for reviews.
- Maintained requirements and design documentation connecting expected behavior with implementation and verification evidence.
- Presented design review results and incorporated specialist feedback into algorithms, tests, and documentation.

Associate Controls Engineer

June 2010 - May 2012

Prairie Dynamics Engineering

Rockford, IL

- Supported industrial control system development through model evaluation, implementation, bench testing, data analysis, and engineering documentation. Worked under senior engineering guidance while building foundations in requirements, diagnostics, prototyping, and release support.
- Supported control system development through model evaluation, implementation, bench testing, and engineering documentation.
 - Converted system behaviors into software requirements and test cases under senior engineering guidance.
 - Processed experimental data to compare expected and observed response and identify investigation needs.
 - Built **proof of concept** control functions and test utilities for design evaluation.
 - Investigated integration defects through reproduction, log review, evidence documentation, and review preparation.

PROJECTS

GNSS Machine Guidance Platform 📅 2023

Directed algorithm strategy, requirements traceability, sensor integration, and field issue resolution for a multi product machine guidance platform.

Commissioning Diagnostics Program 📅 2021

Built diagnostic workflows for communications, sensors, timing, and control response, supporting faster failure isolation across mobile machinery.

LEADERSHIP & AWARDS

- Project Management Professional certification renewed in 2026.
- Engineering Mentor, Central Illinois Controls Professionals, 2023 to Present.

EDUCATION

Bachelor's Degree in Computer Engineering 2010
Illinois Institute of Technology GPA: 3.5 Chicago, IL
Coursework: Control systems, embedded software, computer architecture, engineering mathematics

CERTIFICATIONS

- Project Management Professional 📅 2026
- PMP Renewal 📅 2026

TECHNICAL SKILLS

- **Positioning Systems:** GNSS, optical total stations, lasers
- **Control Theory:** feedback control, state estimation, actuator control
- **Embedded Software:** embedded C, real time software, firmware
- **Requirements Engineering:** functional requirements, non functional requirements, traceability
- **Project Management:** PMP, critical path monitoring, lifecycle planning
- **Product Development:** conceptual design, NPI, production introduction
- **Prototyping:** proof of concept, prototype software, bench testing
- **Diagnostics:** failure analysis, log review, corrective verification
- **Machine Automation:** machine guidance, commissioning, mobile machinery
- **Data Analysis:** machine logs, controlled tests, performance analysis
- **Systems Integration:** sensor integration, communications, supplier components
- **Quality Engineering:** quality reviews, verification evidence, release readiness

SKILLS

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|--------------------|-------------------------|----------------------|----------------------|
| • Team leadership | • Embedded software | • Prototyping | • Software lifecycle |
| • GNSS | • NPI | • Troubleshooting | • Data analysis |
| • Machine controls | • Requirements analysis | • Product design | • Technical coaching |
| • State estimation | • Traceability | • Project management | |

PROFESSIONAL AFFILIATIONS

- Central Illinois Controls Professionals, Engineering Mentor.
- Professional engineering community participant focused on controls and machine automation.

LANGUAGES

- English (Native)
- Spanish (Intermediate)

ADDITIONAL INFORMATION

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

REFERENCES

AVAILABLE ON REQUEST