# Matthew H Rockwell

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## Technical Summary

Mechanical Engineer with 8+ years integrating manufacturing engineering fundamentals with advanced digital systems. Core expertise in tooling design, GD&T application (ASME Y14.5), and metrology automation (ZEISS PMI workflows), enhanced by software development capabilities for manufacturing automation and data integration. Demonstrated impact implementing automated inspection systems, leading injection molding NPI programs, and architecting IIoT platforms that address equipment integration and data integrity challenges in R&D production environments. Experienced in Siemens PLM/MES ecosystems, validation protocols (IQ/OQ/PQ), FEA/CFD analysis, and cross-functional technical leadership.

## Core Competencies

**Digital Manufacturing & Automation**: IIoT platform architecture, RESTful API development (Node.js), MES/MOM integration, equipment communication protocol design, visual workflow automation, data pipeline architecture, SQL/PowerBI analytics

**Tooling & Manufacturing Engineering**: Custom injection-molded packaging development, tool/fixture design, DFM optimization, GD&T (ASME Y14.5-2018) interpretation and application, tolerance stack analysis, reverse engineering

**Metrology & Quality Systems**: ZEISS CMM programming & PMI automation, R&R gage studies, DoE methodology, validation protocols (IQ/OQ/PQ principles), inspection plan development, dimensional compliance analysis

**Software & Systems Integration**: Full-stack development (React, Node.js, AWS), Siemens Teamcenter/NX/Opcenter, SolidWorks/3DEXPERIENCE, Autodesk Moldflow, Python for data science, DevOps/CI-CD workflows

**Advanced Engineering Analysis**: Multi-platform FEA (ANSYS + [others]), computational fluid dynamics (Siemens), multi-physics simulation, digital twin conceptualization

## Experience

**Advanced Engineering & Systems Development**                          Santa Rosa, CA

*Independent Professional Development*                                   *Sep 2025 – Present*

- Deepening expertise in multi-physics simulation across FEA platforms (ANSYS, AutoCAD Moldflow, Solidworks Simulation) and multiple CFD applications for complex engineering analysis.

- Developing full-stack IIoT manufacturing automation platform (React/Node/AWS) addressing critical pain points identified during tenure at Keysight Technologies.

- Architecting equipment-agnostic API schema with single source of truth database design, eliminating individual macro ownership and protocol-change brittleness.

**Tekberry**                                                            Santa Rosa, CA

*Manufacturing Metrology Technician*                                    *Nov 2024 – Sep 2025*

- Implemented ZEISS PMI automated inspection workflows, generating inspection plans directly from 3D CAD models to reduce setup time and improve first-pass dimensional compliance.

- Collaborated with process, integration, and planning engineering teams to refine GD&T specifications and optimize measurement strategies for complex geometries.

- Conducted R&R gage studies and design of experiments (DoE) on metrology equipment to quantify measurement system capability and reduce process variation.

- Established fixture validation and calibration procedures compliant with ASME Y14.5-2018, documenting protocols for cross-functional team adoption.

- Identified over-constrained and under-constrained dimensions on production drawings, providing DFM feedback that reduced manufacturing costs and improved production efficiency.

**Children's Museum of Sonoma County** — Santa Rosa, CA
*Facilities Maintenance Engineer* — *Aug 2024 – Nov 2024*

- Restored weathered helicopter exhibit through structural repair, fabrication of custom fiberglass replacement components, and integration of interactive sensory elements including Talk Tube communication system.

- Rebuilt "Glow Board" exhibit electrical system with reinforced cabling architecture designed to withstand high-frequency tactile interaction by museum visitors.

**SingularityNET** — Remote
*Ambassador (Selective, Volunteer)* — *Jan 2023 – Aug 2024*

- Addressed UN panel on AI/AGI safety considerations, adoption frameworks, and realistic capability assessments in current technological landscape.

- Translated conventional AI programming architectures to equivalent blockchain-based implementations, bridging centralized and decentralized AI infrastructure paradigms.

- Completed professional certifications: Applied CFD (Siemens), Python for Data Science & AI (IBM), Cloud Computing/DevOps (IBM), Advanced GD&T during tenure.

**Keysight Technologies** — Santa Rosa, CA
*Advanced Manufacturing Engineer* — *May 2022 – Jan 2023*

- Led tooling and fixturing design for NPI programs using SolidWorks and DFM principles, aligning features, tolerances, and material strategy with downstream manufacturability.

- Drove department-wide transition to Siemens Teamcenter and Opcenter MES, establishing digital thread, revision control discipline, and cut onboarding time by 40% for new NPI documentation pipelines.

- Mentored entry-level engineers, guiding the development of their knowledge, accelerating their contribution timeline by 30% within our manufacturing ecosystem by identifying challenging details early and developing targeted training modules.

**Keysight Technologies** — Santa Rosa, CA
*Manufacturing Technician* — *May 2019 – May 2022*

- Worked directly with Zebra's engineering team to develop automated labeling systems infrastructure, enabling custom-quantity customer orders with consistent packaging and component-level traceability.

- Developed FactoryWiz-driven analytics infrastructure for manufacturing pipelines, integrating OEE dashboards, automated utilization reporting, and predictive maintenance logic into broader MES infrastructure.

- Increased department production capacity by 25% by onboarding precision CNC sandblasting equipment and developing modularized test and production tooling and fixturing.

**Keysight Technologies** — Santa Rosa, CA
*Manufacturing Engineering Intern* — *Jan 2018 – May 2019*

- Increased throughput 80% for glass-to-metal sealing via tooling redesign, CNC deglassing tooling integration, and process station optimization by transitioning from manual to automated procedure.

- Reduced scrap 70% in high-precision optical assemblies by designing custom tooling through collaboration with machinists, assembly operations teams, and process engineers.

- Implemented laser engraving standards and automated serialization process for improved traceability.

**Keysight Technologies** <span style="float:right">Santa Rosa, CA</span>

*Electromechanical Engineering Intern* <span style="float:right">*Jul 2017 – Jan 2018*</span>

- Reduced failure rates 65% in Boeing multi-port RF switches through material testing and redesigning high-stress components.

- Developed high-speed signal test system reducing test time by 80% while increasing diagnostic resolution.

- Built web-based failure analysis dashboard to visualize test data and lead corrective-action meetings.

## Relevant Engineering Projects

**Wire EDM Integration**: Built full tooling + infrastructure deployment for Wire EDM asset, including cooling, power, rack systems, and process workflows; achieved 40% ROI in 6 months.

**PLM/MES Transformation**: Led transition to Siemens Teamcenter and Opcenter MES across engineering and production, standardizing revision control, NPI documentation, and quality workflows.

**3D PMI Automation**: Implemented ZEISS/Teamcenter-driven PMI pipeline producing automated inspection plans and real-time quality dashboards.

**CNC/FactoryWiz Monitoring**: Developed analytics architecture for real-time machine health, downtime tracking, and predictive maintenance logic.

**Automated Packaging System**: Designed gated-tab packaging compatible with automated ZEBRA labelers, enabling customer specific quantity orders without retooling packaging lines.

**IIoT Manufacturing Automation Platform**: Building visual drag-and-drop interface for manufacturing pipeline automation, enabling shop floor layout modeling with real-time data flow visualization

## Education

**San Francisco State University** <span style="float:right">San Francisco, CA</span>

*B.S. in Mechanical Engineering*

## Certifications

*Applied Computational Fluid Dynamics (Siemens)*

*Python for Data Science & AI (IBM)*

*Introduction to Cloud Computing, DevOps, Git/GitHub, LLMs (IBM)*

*Advanced GD&T (GD&T Basics)*

*Fundamentals of Fluid Power (University of Minnesota)*

*Industrial Internet of Things (University of Michigan)*

*Onramp for MATLAB, Simulink, Machine Learning, System Composer, Stateflow, Control Design, Simscape, Multi-body Simulation, Circuit Simulation, Power Electronics Simulation, Power Systems Simulation, Simscape Battery, Parallel Computing, Deep Learning (MathWorks)*