Toni Grubesic

Mechanical Engineer — Test Systems • CAD/DFM • Prototyping
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Croatian & U.S. citizen — fluent in English and Croatian | Open to relocation to Croatia

Summary

Mechanical Engineer specializing in battery testing automation, mechanical fixtures, and system integration. Experienced in building Python/LabVIEW frameworks to control multi-instrument setups (cyclers, chambers, power supplies) with real-time logging, QC thresholds, and safety interlocks. Skilled at translating test requirements into CAD models, jigs, and production-ready documentation, with hands-on CNC and manufacturing experience. Background spans ultracold physics instrumentation and automotive/motorcycle telemetry, combining rigorous technical design with practical, workshop-driven execution. Fluent in English and Croatian, dual citizen, open to relocation.

Core Skills

- **Battery & Test Systems**: Python (SCPI/serial, pandas, matplotlib), LabVIEW, MATLAB, DAQ integration, safety interlocks, automated data pipelines, QC thresholds
- **Mechanical Design & CAD**: SolidWorks, Fusion 360, CATIA (familiar), GD&T, tolerance analysis, 2D/3D documentation, fixture & jig design
- **Fabrication & Prototyping**: 3-axis CNC, manual mill/lathe, TIG/MIG welding, sheet metal, carbon fiber layup, 3D printing (FDM/CF composites), assembly & rig commissioning
- **Engineering Analysis**: FEA (static, thermal, modal), design optimization, DFM/DFA, system-level problem solving
- **Test Rig Development**: Custom fixtures, chamber/thermal integration, calibration tracking, commissioning support
- **Project Tools**: Git, Excel/Sheets, Primavera P6, technical documentation
- **Domains**: Battery systems (cell, module, pack testing), powertrain/e-motor systems, automotive & motorcycle hardware, advanced instrumentation

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Experience

Automation Engineer (Battery Testing) — Contract
Lawrence Livermore National Laboratory (LLNL), Livermore, CA | 2024–2025

- Designed and built a precision press with tight tolerances and miniature components to assemble and test experimental batteries.
- Enabled researchers to load cells with different electrolytes and adjust temperature and pressure for controlled evaluation.
- Integrated press into automated test rigs alongside cyclers, power supplies, and chambers via Python/LabVIEW (SCPI/serial).
- Developed modular drivers, recipe executors, and real-time QC/safety interlocks, improving repeatability and compliance.
- Automated analysis/reporting (pandas/matplotlib) and authored user documentation for seamless adoption.
- Supported calibration and commissioning of test systems, and provided training for researchers.

Undergraduate Research Assistant — Ultralow-Temperature Systems
California State University, Chico | 2022–2024

- Contributed to the design and fabrication of a vacuum test chamber for ultracold atom experiments, a multi-year instrumentation project.
- Modeled and manufactured precision mechanical components with tight tolerances for vacuum integration.

- Supported rig assembly, alignment, and commissioning, collaborating with physicists to ensure mechanical systems met experimental requirements.
- Applied CAD, tolerance analysis, and materials selection to achieve reliability in extreme operating conditions.
- Presented progress in design reviews and lab meetings, demonstrating ability to communicate technical solutions.

Project Engineer Intern

Harder Mechanical Contractors, Inc. | *Summer 2024*

- Supported large-scale mechanical projects with a focus on project management and scheduling.
- Built and maintained Primavera P6 schedules tied to resources and milestones, improving planning accuracy.
- Developed cost tracking dashboards to keep scope aligned to budget and dates, improving visibility for engineers and PMs.
- Streamlined RFIs, submittals, and change order workflows to shorten feedback loops and prevent delays.
- Gained exposure to contractor–client coordination, balancing design, cost, and execution requirements.

HVAC Technician & Service Coordinator

GB Heating & AC, Pacheco, CA | *2017–2025*

- Worked both in the field and office, bridging technical work with customer-facing responsibilities.
- Managed service scheduling, customer communication, and documentation, ensuring smooth workflow between technicians and clients.
- Delivered professional customer experience by resolving issues, planning maintenance, and explaining technical solutions.
- Developed early skills in organization, responsibility, and cross-team coordination that translate into engineering project environments.

Education

B.S., Mechanical Engineering — California State University, Chico

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Projects

Battery Press & Automation System (LLNL)

- Designed and built a precision press with tight tolerances and miniature components for experimental battery assembly and testing.
- Enabled researchers to load cells with varying electrolytes and control temperature and pressure during operation.
- Integrated the press into larger Python/LabVIEW automated test rigs, ensuring safety, repeatability, and data traceability.

Motorcycle Telemetry & Lean-Angle System

- Designed and built a custom PCB + firmware + UI for motorcycle-mounted telemetry.
- Integrated 9-axis IMU, TPMS, ECU, and GPS to deliver real-time analytics and lean-angle tracking.
- Implemented sensor fusion, filtering, and serial comms for rugged performance under vibration and weather exposure.

SAE Baja — Chassis & Fabrication (2022–2023)

- Contributed to the design and validation of an off-road competition chassis, focusing on strength and reliability.
- Performed machining of precision components, welding, and fabrication of structural parts.
- Built fixtures and jigs for repeatable assembly and alignment.
- Supported testing and inspection for rigidity, durability, and safety compliance.