

Alec Hardy

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✂ Portfolio: <https://hardyautomation.com/about>

Career Objective

A role developing electro-mechanical robotic and automation systems, particularly focusing on control software and hardware.

Skills

- ✂ Robotics & Control System Design
- ✂ Automation System Design
- ✂ Embedded System Programming
- ✂ 3D Rapid Prototyping
- ✂ Custom PCB Design
- ✂ Application/Web Programming
- ✂ Artificial Intelligence
- ✂ CAD Solid Modeling
- ✂ C, Python, SCL/LAD, ASM

Work Experience

Robotics Engineer, Sole Proprietor of **Hardy Automation**, Santa Rosa, CA 08/2020 – Current

- ✂ **“Sprocket”**: Designed, manufactured, programmed, documented, and sold 12-DOF robotic quadruped.
 - Designed robotic quadrupedal robot in SolidWorks. 3D printed mechanical parts. Developed PCB for power distribution and electronic communication. Developed Python control code running on Linux for robot control, motion, command handling, and data display through web interface.
 - Researched and developed walking and behavioral algorithms; utilized Artificial Intelligence (Genetic Algorithms) to improve walking gait.
 - Thoroughly documented entire assembly process on website. Selling parts and kits through online store.
- ✂ **“RPM Weight Bench”**: Designed pneumatic hands-free robotic safety system for free-weight exercise bench.

Expert Automation/IT Engineer at Keysight Technologies, Santa Rosa, CA 06/2017 – Current

- ✂ Sole designer, builder, and programmer for multiple industrial automation systems using Siemens PLCs, HMIs, IO components, sensors, and data reporting with Raspberry Pi, ESP32 hardware, C/Python firmware. Automation systems include:
 - Fab equipment monitoring system composed of SCADA systems, multiple PLCs, and 60+ remote HMIs.
 - Leak detection and environmental condition monitoring, automated fluid valve shutoff system.
 - Optical plasma monitoring system using custom computer vision plasma detection sensor.
- ✂ Mechanical design, programming, and commissioning of custom-application 5-axis CNC “Ribbon Bonder”
 - Designed and facilitated manufacture of machined mechanical parts.
 - Sole programmer for control system of 5 motors, 3 heaters, pneumatics, buttons and touch screen HMI.
 - Performed equipment qualification and integrated new tool into semiconductor manufacture process.
- ✂ Equipment Integration Lead for new Semiconductor Fab Manufacturing Execution System (MES).
 - Collaborated with equipment vendors, MES developers, and IT department to ensure green-field semiconductor fab had required computer systems, servers, networks, and configurations in place for autonomous manufacturing.
 - Developed custom scripts and applications to ensure data and control flow between equipment.

Education

California Polytechnic State University - San Luis Obispo, CA – June 2020 Graduate GPA: 3.8
M.S. and B.S. in **Mechanical Engineering, Mechatronics** concentration
Minor in **Computer Science**, focus on embedded systems and artificial intelligence
Laboratory Instructor for Introduction to Mechatronics (microcontroller programming in S12X Assembly)

Academic Design Projects

Underwater Pier Camera – Designed and installed web-operated user-controllable underwater pier camera.

SAE Baja Electronic Continuously Variable Transmission (e-CVT) – Designed control system for e-CVT to provide ideal gear ratio in real time for off-road Baja vehicle.