Sam Westgard

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Summary

R&D mechanical engineer with 5+ years developing prostheses, orthoses, and robotic devices from concept through clinical field trials, verification, and commercial launch.

Experience

Fillauer Motion Control Nov 2024 – Present
Research and Development Engineer *Salt Lake City, UT*

- Developed the hydraulic system for the Traverse AV prosthetic foot, with adjustable plantarflexion damping, foot-flat locking for greater energy return, and toe lift in swing.
- Machined tight-tolerance parts on manual mills, lathes, and a CNC mill; programmed toolpaths in Mastercam.
- Provided engineering and production support for the Traverse AV and SLX feet through commercial launch.
- Planned and ran 10+ two-week take-home trials and 15+ in-clinic patient trials with clinical partners, analyzing user data to drive design iterations.
- Executed design verification testing for safety, durability, and regulatory compliance.

QXN LLC Oct 2023 – Nov 2024
Research and Development Engineer *Salt Lake City, UT*

- Led product development from concept through launch, balancing performance, manufacturing cost, and market requirements.
- Designed and ran optimization experiments and used the performance data to improve product designs.
- Sourced suppliers and managed manufacturing inventory to meet production schedules while controlling cost and quality.

HGN Lab for Bionic Engineering, University of Utah May 2021 – Jun 2023
Graduate Research Assistant *Salt Lake City, UT*

- Developed a semi-active ankle prosthesis powered by a series-elastic actuator, with a sensor- and encoder-based control system (co-inventor, WO2023204982A2).
- Built closed-loop controllers in Simulink and LabVIEW.
- Optimized component geometry using kinematic simulations in MATLAB.
- Designed, machined, 3D printed, and surface-mount soldered components for robotic assistive devices.

Parker Hannifin, Human Motion & Control (now Ekso Bionics) Jan 2020 – Jul 2020
R&D Co-op Engineer *Macedonia, OH*

- Designed two cyclic loading test fixtures: a dual-station load tester and a rapid sensor-testing fixture.
- Designed and tested an exoskeleton transmission tester and an ankle-foot orthosis.

Parker Hannifin, Human Motion & Control (now Ekso Bionics) May 2019 – Aug 2019
Engineering Intern *Macedonia, OH*

- Designed a gait-replication machine that reproduces human walking loads (co-inventor, WO2022086498A1).

Education

University of Utah Salt Lake City, UT
M.S., Mechanical Engineering Jun 2023

Clarkson University Potsdam, NY
B.S., Mechanical Engineering | GPA: 3.93 / 4.0 Dec 2020

Patents

- L. Gabert, T. Lenzi, C. Buchanan, M. Tran, **S. Westgard**, "Semi-Active Ankle/Foot Prosthesis Powered by a Series-Elastic Actuator," WO2023204982A2.
- **S. Westgard** and R. Farris, "Biomechanical Motion Device for Human Gait Load Replication," WO2022086498A1.

Skills

Design:	Mechanical design, DFM, GD&T, electromechanical systems
Testing & Regulatory:	Design verification, product and field testing, regulatory documentation, ISO 13485
Controls & Electronics:	Closed-loop control, sensor and encoder integration, surface-mount soldering
Software:	SolidWorks, Mastercam, MATLAB, Simulink, LabVIEW