

Engineering design experience

SolidWorks, SolidWorks PDM Professional and wPDM. CSWA/CPPA certified.

Design for manufacturability, assembly, alignment and shipping in low and high volumes.

Precision motion and usage of kinematic design principles applied with working application of GD&T.

Mechanical design with stages, rails, lead/ball screws, machined/cast/extruded frames, robotic manipulation and optical interfaces.

Electro-mechanical experience integrating with motors, linear and rotary encoders, optical sources, wiring and CCD/CMOS cameras.

Applied optics knowledge - principles and components for imaging, illumination, steering & sensing.

Design skills and experience (design for ...):

- 3 through 5 axis milling, turned parts, sheet metal design, diamond turning.

- FDM, SLA and DLMS rapid fabrication.

- Sand and investment casting, dip brazing.

- Injection, micro-injection and cast urethane molding design.

- PCB, cable and flex circuit design, wiring layout and component integration.

- Part finishing – plating, coating, painting, surface finishes.

Design portfolio available upon request

Professional Experience

Senior Mechanical Engineer, Optikos Corporation

February 2012 – Present (Senior ME as of January 2017)

Optomechanical design work and system integration through the entire development process from cradle to grave, including assembly and shipment, for custom and standard products and services.

Direct experience with medical, military, and electromechanical design projects and parameters for both domestic and foreign clients. Regularly supporting multiple simultaneous projects.

Extensive use of SolidWorks and FEA coupled with integration of custom designed and COTS parts.

Enterprise and Workgroup PDM system architect, migration lead and administrator, ISO 9001 internal audit leader.

Project manager experience with full responsibility for on-time design and shipment, comfortable working either as sole contributor or working in part of larger design and assembly effort.

Trained in and utilized for optical component cleaning, assembly, alignment, testing, and debugging.

Key resource for training and generation of documentation to support project/general company goals.

Owner, OutdoorEquipmentSupplier LLC

2003 - 2017

Sole proprietor in charge of design, manufacturing and sales of custom ultra-lightweight backpacking shelters.

Hired, trained and managed two employees performing production and administrative work.

Administered web-based storefront at www.OutdoorEquipmentSupplier.com.

Global Finalist, EO Global Student Entrepreneur Awards (2011).

Research Assistant, University of Rochester

September 2009 – May 2010, Mechanical Engineering Department

Optimized and implemented experimental methods for testing erosive properties of diamond impregnated pellets for optical polishing. Primary author in *Wear* journal article.

Applied Analysis of Variance (ANOVA) techniques and used scanning electron microscopy to design and complete new testing based on data collection and verification of erosive model.

Selected Engineering Projects

Automated Production Intraocular lens (IOL) test system

Lead designer on production level 24/7 uptime instrument for testing surgically implanted lenses. Managed several ME's while directing software and system departmental resources. System integrated 4DOF/6DOF robotic handling in FDA-regulated cleanroom environment. Led mechanical/systems effort of alpha program to provide concept testbed for production phase.

Vertical R&D Contact Lens Testbed

Sole contributor ME on project integrating over a dozen subassemblies in lab based multi-axis controlled system. System architect tasked to turn prescribed optical principles into hardware. Several novel optical systems coupled with thermal, environmental and vibration control.

LensRentals OLAF Lens Realignment System

Project manager for mechanical, optical, and software design effort. Sole mechanical designer – concept integration with CAD design, detailing prints, assembly, re-assembly and alignment at customer site. Additional systems shipped to multiple continents.

Medical Sequencing Testing Unit package

Micro optics and housing design, experience with molding design, space constrained features and working with molder into production phases and assembly integration. Successful transition to high volume contract manufacturing production.

Medical device design experience

Handheld pediatric cardiac surgical tool, production of several generations of prototypes and leading to spinoff company. Patent currently awaiting final approval with USPTO. Three channel optics detection package for commercial medical sensing designed for volume production. Reverse engineering of several medical optical systems and mechanisms.

Education

University of Rochester, Rochester, New York

B.S. in Mechanical Engineering, May 2010

M.S. in Mechanical Engineering, May 2014

Thesis title: *Study of abrasion on the performance of lightweight water impermeable coated textiles.*

Certified Engineer in Training (EIT)

Additional Skills

Familiarity and experience with LabVIEW, MATLAB, Mathematica, JMP Statistics, SYSPRO.

Machine shop skills including precision lathe and mill work.

Experience with interferometric testing and alignment methodologies.

Knowledge and application of quality engineering methodology including DoE and ANOVA.

Publications

MacMillin Brian E , Roll Chris D, Funkenbusch Paul D, Erosion and surface structure development of metal-diamond particulate composites, *Wear* 2010; 269(11-12): pp. 875-883.

Roll Chris D, MacMillin Brian E, Funkenbusch Paul D, Quality testing of diamond-abrasive, metal-bond grinding tool materials, In: *Optical Fabrication and Testing*, Jackson Hole, WY, June 13, 2010: pp. jmb10.

Honors

Boy Scouts of America Eagle Scout with Bronze Palm

Departmental Teaching Service Award, Mechanical Engineering Department, University of Rochester

Interests

Triathlon, photography, squash, hiking, skiing, and computers & technology