

Gordon C. Kirkwood

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Professional Summary

I'm a Mechanical Engineer specializing in design and rapid prototyping of mechatronic systems incorporating mechanical, electronic, sensor, and software elements. An extremely diverse background informs my special ability of identifying creative solutions, and includes significant experience not only in my main strength of mechanical engineering and fabrication, but also materials science, biochemistry and medical diagnostics, instrumentation, design of experiments, failure analysis, electrical engineering, robotics, and motion control. I take pride in building solutions to challenging problems.

Highlights

- Adept mechanical designer and fabricator, with electrical engineering, coding, and testing skills
- Fabrication skills: CNC machining, 3D printing, TIG welding, EDM, laser/waterjet, moldmaking, composites, embedded controllers, PCBA
- Software: Solidworks, HSMWorks, Inventor, Matlab, KiCAD, C, Python
- Excellent technical communication, design sense, and engineering intuition.
- Highly creative problem solver and multidisciplinary, out of the box thinker: see [website](#)

Experience

Senior Research Engineer, SRI International (Sept 2015 - April 2020)

Designed and prototyped new ultralight electrostatic actuators, new robotic grippers, and new types of gear transmissions. Engineered injection molded and microfluidic parts for mass production (>1M) of medical diagnostic tests. Winner of SRI's highly competitive internal \$100,000 "Shark Tank" award for a new additive and subtractive fabrication system of my own invention. Inventor of a novel gripper which was issued Patent #[US10710247](#).

Artist in Residence, Autodesk (January 2015 – June 2015)

Invented and fabricated a [new type of robotic end effector](#) to manipulate fluid membranes.

Co-Founder, Manifold Technologies LLC (2012-2014)

Product development and rapid prototyping: mag-lev, electronic control systems, CNC jobs, and robotics

Senior Lighting Consultant, Forms and Surfaces, Inc. (2011-2013)

Optical and electrical design of state of the art LED lighting products, and manufacturing quality control for this principal interior lighting supplier for Apple Computer stores and elite hotels and residences around the world, including the flagship Sun City Apple Store in China.

Automation Engineer, TAKTL (2010-2011) Designed and built automated fluid measurement and dispensing apparatus, and automated product quality sensors for a composite materials production line.

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Manager of Research and Development Lab, Matco Associates, Inc. (2008-2010)

Led a team of engineers and scientists tasked with rapid development of new test instrumentation to handle unconventional forensic engineering investigations. Developed and performed many mechanical, electrochemical, magnetic, and electrical property tests. Issued a patent for a novel corrosion sensor.

Project Manager, Matco Associates, Inc. (2005-2008)

Conducted forensic engineering investigations to determine the cause of industrial problems and failures in wide ranging industries. Author of hundreds of technical reports detailing investigations of mechanical, electrical, corrosion, and design problems, from medical implants to rocket engines. Clients included NASA, Boeing, Lockheed Martin, Chevron, Industrial Scientific, municipal governments, and many others. Skills included Electron Microscopy, EDAX, Electrical Impedance Spectroscopy, Cyclic Voltammetry, etc.

Graduate Student, University of Pittsburgh, McGowan Institute for Regenerative Medicine (2001-2004)

Developed algorithms to support direct brain control of robotic prosthetic limbs via implanted cranial electrodes. Developed real time control systems in C, built electronic apparatus and mathematical models, trained rhesus monkeys, and won "TA of the year" award for an undergraduate course, "Signals and Systems: Gadgeteering and Gizmology," on analog and digital electronic design.

Education

Graduate Student, Department of BioEngineering, University of Pittsburgh. 2001-2004

Dissertation Research: Direct brain control of a prosthetic robotic limb by rhesus monkeys using implanted cortical microelectrode arrays.

B.A., Biology: Reed College, Portland Oregon. 1995-1999

Wrote computational simulations of genetic regulatory networks and performed nonlinear dynamics simulations to investigate the evolution of multicellular life. Thesis: "The evolution of control of cellular differentiation: The statistical likelihood of hierarchical control points prior to natural selective forces"

Additional Information

- Builds amphibious human powered vehicles for competitive "kinetic sculpture racing"
- Judge for the World Human Powered Speed Challenge.
- [Emmy award nominated musician](#): cellist & composer
- Winner of Howard Hughes Medical Institute Fellowship Award, 1998
- Fellowship in Nuclear Medicine at the National Institutes of Health, 1997
- Nuclear Reactor Operator, General Atomics Triga Mark II reactor, Reed College Reactor Facility