

## Douglas Schwandt

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### PROFESSIONAL EXPERIENCE

**Biomedical Engineer, VA Palo Alto Health Care System, Rehab R&D Center** *Dec 1980 – Apr 2005*

Principal mechanical designer supporting basic and applied research studies and product development including: special research cycle ergometers for stroke patients, for cardiovascular stress research studies during MRI, and with novel pedaling regimes for basic neuromuscular coordination studies; arm-powered bicycles and tandems for individuals with lower limb disability; differential pressure walking assist device; Constraint Induced Therapy workstation for stroke patients; fingerspelling robotic hand for deaf/blind; and undifferentiated mesenchymal cell loading devices for musculoskeletal developmental biology research. Proposed, negotiated purchase, helped install, and trained on DMG 5-axis Milling Ctr.

**Mechanical Design Consultant:**

*Dec 1986 - present*

**Kinea Design, L.L.C., Evanston, IL** (<http://kineadesign.com/>)

Provide mechanical design services in the development of assistive robotic devices (KineaAssist) and bionics (DARPA's Revolutionizing Prosthetics Program) for physical therapy and rehab: conceptual design generation; collaborate with other designers, engineers, therapists and machinists to incorporate disparate ideas; concept model development; SolidWorks<sup>R</sup> modeling/simulation, stress analysis, and assembly (*Dec03 – present*).

**Alter-G, Fremont, CA** ([www.alter-g.com](http://www.alter-g.com))

Assisted in the development of the M300 G-Trainer, including structures and mechanisms, FEA, and working with an industrial designer to create 3D SolidWorks models for a vacuum formed control panel. The G-Trainer is the commercial product evolved from my early work with the inventor, on the Differential Pressure Walking Assist at the VA and NASA (*Aug08 - present*).

**Watson Furniture Group, Poulsbo, WA** ([www.watsonfurniture.com](http://www.watsonfurniture.com))

Provided early stage conceptual development of adjustable desk height lifting mechanisms, including rapid ideation, sketches, SolidWorks modeling, and analysis (*Sep09 - Dec09*).

**Lucile Packard Children's Hospital at Stanford, CA**

Developing a motorized ankle torque device and potential product for the diagnosis of neuromuscular deficits in children (*May06 –*). Provided prototype CAD design consultation for the NIDRR funded "Tot Walker Project," a liberating walking mobility device for infants and small children with cerebral palsy ('02).

**Rehabilitation Institute of Chicago (& Northwestern University, ME Dept.) Chicago, IL**

Designed, analyzed, assembled and installed a multi-positionable, motorized limb movement device for use in neuro-musculo-skeletal studies of human movement (*Jun06-Apr07*).

**Physical Therapy Department, Health Sciences College, Marquette University, Milwaukee, WI**

Provided mechanical design services in the development of a tilting cycle ergometer for use in motion science research with stroke patients, incorporating existing exercise products, seat frame design, integrating motion encoder and instrumented pedals (*Dec04 – Mar05*).

**Departments of Radiology, Stanford University School of Medicine, Stanford, CA**

Developed simple wooden and plastic non-invasive leg guiding mechanisms for prone and supine subjects, during C-Arm X-Ray research studies (*Nov04 – Dec06*).

**Physical Therapy & Human Movement Sciences, Northwestern University, Chicago, IL**

Provided mechanical design services in the development of an adjustable foot force/moment positioning and measuring device simulating various phases of gait, for use in motion science research with stroke patients (*Mar05–May05, Apr0*); in-service on tilting cycle ergometer (*Apr07*).

**University of British Columbia and Vancouver Acute, Vancouver, BC, Canada**

Modified my early design, and built a PVC knee squat device with sliding backrest and toggling seat rest, for use in a GE MRT (open gap research MRI) at Harvard University's Boston Brigham & Women's Hospital on a collaborative imaging study investigating patello-femoral joint pain.

**Daedalus, SBIR funded small business, San Francisco, CA**

Consulted on early prototype development of novel wheelchairs and manual drive systems for SBIR grants including conceptualization, design and prototyping (*May04–Sep05*).

**Whipsaw, Inc., San Jose, CA**

Worked with other engineers and industrial designers to develop quick-connect latch mechanism design concepts in support of the Topcon GPS Line product development ([www.whipsawinc.com](http://www.whipsawinc.com)), using SolidWorks<sup>R</sup> modeling (*Nov03 – Mar 04*).

**Magnetic Resonance Systems Research Laboratory, EE Department, Stanford University**

Designed and constructed a one-of-a-kind MRI receiving table with folding steps ([http://www-mrsrl.stanford.edu/tour/2007/2007\\_scantable.jpg](http://www-mrsrl.stanford.edu/tour/2007/2007_scantable.jpg)) for a GE Signa MRI used in research ('01 – '02).

**NASA-Ames Research Center / Lockheed/Bionetics.** Studied existing commercial exercise devices and concepts under development at NASA's Kennedy and Johnson Space Centers and Ames Research Center. Designed exercise devices as a musculoskeletal deconditioning countermeasure during long-duration space flight including differential pressure hypo/hyper-gravity walking simulators, treadmill lift/tilt mechanisms, Inter-Limb Resistance Exercise Device flight certified hardware which flew aboard US Space Shuttle *Atlantis* 1994 flight (STS-66), MRI spinal compression harness, and initial concept drawings for a human powered centrifuge ('89 – '99).

**Innovate.** (unincorporated small business). Designed alternative bicycle transmission prototype based upon client's patented concept ('96 – '98).

**Innovision.** (Danish Company). Essentially provided technology transfer to assist contractor in initial phases of design of lower body negative pressure exercise device for European Space Agency ('96).

**Akros Solutions / Ability Designs.** Reconstructed inflatable bathing units for disabled in preparation for market exploration in Japan, involving design of fixtures for RF heat-sealing of urethane coated nylon ('90).

**Stanford Center for Design Research.** Developed NASA prehensor performance criteria incorporating natural hand function activities and standardized hand function texts. Checked detail drawings before fabrication (1986).

Co-founder and President, **Recreational Mobility Inc** (Elmira, Oregon) *Apr 1983 - Aug 1984*  
Started small business to manufacture and market the Handbike arm-powered bicycle.

Consulting Mechanical Engineer, **CH2M Hill** (San Francisco) *Jul 1980 - Dec 1980*  
Studied potential of solar interfacing with industrial process heating for US Department of Energy.

Assistant Engineer, **DuPont Engineering Development Laboratory** (Wilmington) *May 1979 - Aug 1979*  
Designed pipefitting and programmed color swirl patterns for polymerizing fluid for Corian<sup>R</sup> product line.

## INTERNATIONAL DESIGN FORUMS

Invited Speaker, **Japan External Trade Organization** (Okayama, Japan) *Feb 2000*

Keynote speaker at Okayama-California Symposium for Development of Medical and Health Care Industries, to audience of medical product company leaders, hospital directors, federal labs and university scientists, and government planners. Visited companies, labs, and institutions, and reviewed inventions.

Design Specialist-in-Residence, **USIA, Design USA Exhibit** (Novosibirsk, USSR) *Aug – Oct 1990*

Presented to Soviet audiences giving examples of excellent product design in America and designs for disabled, met with Soviet designers, and demonstrated Handbike on exhibit.

## EDUCATION

1980 **MS** Mechanical Engineering, Design & Thermosciences, **Stanford University**  
1979 **BS** Mechanical Engineering, School of Engineering & Applied Sciences, **Columbia University**  
1979 **BA** Liberal Arts (and pre-medical studies), Columbia College, **Columbia University**

## EXTRA-CURRICULAR

US Diving Certified Coach, **Stanford Diving Club / Saint Francis** (1991, 2003, 2005 – present). Coached (part-time) divers of all ages (5 to 63 years old), from novice to elite skill levels. Tripled club membership in one year and continue to help grow the club to perhaps largest membership in the country. Design, build and install custom exercise and training equipment.

Private Pilot, **Palo Alto Flying Club** (Palo Alto) Single engine, high performance. *2001 - present*

## HONORS/AWARDS/PATENTS

- 2010 Gold Medical Device Excellence Award, M300 G-Trainer, AlterG anti-gravity treadmill (<http://www.canontradeshows.com/expo/awards/awards/>).
- Walking and Balance Exercise Device - Patent No. 7,544,172 B2 Issued June 9, 2009. Two patents pending (including Walking and balance exercise device, US Pat. 10879604).
- IDEA Silver Award for Research Design (ChicagoPT's Kine-Assist<sup>R</sup>), IDSA/BusinessWeek, 2005.
- Best of Category Design Award (Fingerspelling Hand), Industrial Design Annual Design Review, 1993.
- VA Superior Performance Awards.
- Federal Laboratory Consortium Technology Transfer Award, 1989.
- Federal Design Achievement Award (Handbike) in the Presidential Design Awards Program, 1984.
- California Engineer-in-Training certification, 1980.
- Stanford Engineering Graduate Fellowship, 1979/80.
- William A. Hadley Award for "Outstanding Promise of Scholarly and Professional Achievement in Mechanical Engineering," Columbia University, 1979.
- Tau Beta Pi, and Pi Tau Sigma engineering honor societies, Columbia University, 1979.
- Dean's List, 9 of 10 semesters, Columbia University, 1974 thru 1979.

**Design portfolio, publication list and references are available.**