

Pablo Valdivia y Alvarado

Work Address

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Objective Design, analyze and create novel mechatronic devices.

Education **Massachusetts Institute of Technology** Cambridge, MA
Doctor of Philosophy in Mechanical Engineering, expected August 2006.
Specialization: Machine Design, Controls and Robotics
Thesis: "Design, Characterization and Control of Compliant Seamless Biomimetic Devices for Locomotion in Liquid Environments"
Supervisor: Kamal Youcef-Toumi, Sc.D.
Project info: <http://web.mit.edu/pablov/www/research/fish/fish.html>
Minor: Applied Mathematics.

Massachusetts Institute of Technology Cambridge, MA
Master of Science in Mechanical Engineering, February 2001.
Specialization: Machine Design and Controls
Thesis: "Design, Analysis and Control of an Autonomous Conveyance Module for Well Exploration"
Supervisor: Samir Nayfeh, Ph.D.

Massachusetts Institute of Technology Cambridge, MA
Bachelor of Science in Mechanical Engineering, June 1999.
Major: Controls
Thesis: "Modeling and Identification for Control of a Holonomic Variable-Footprint Wheelchair"
Supervisor: Haruhiko H. Asada, Ph.D.

Lycée Franco-Bolivien Alcides D'Orbigny La Paz, Bolivia
Graduated Valedictorian, class of 1994. French Baccalaureate with honor mention, series C (Scientific).

Work Experience

Alpine Pharmaceuticals Inc. Boston, MA
August 2002. Designed and prototyped fluidic devices for facial hair care. Extensive use of polymer based 3D printing techniques. Devices were targeted to both the consumer and healthcare markets, 1 patent granted.

Schlumberger Cambridge Research Center Cambridge, England
June - August 2000. Designed and built a rover type vehicle for downhole exploration. The prototype was used for experimental testing of friction losses and power consumption during downhole operation.

Schlumberger Doll Research Center Ridgefield, CT
June 1999 - January 2000. Developed a new autonomous propulsion module for downhole logging tools. Tasks included mechanical design, system modeling and implementation of control hardware and software. A working prototype and a simulated well for testing were built.

MIT D'Arbelloff Laboratory Cambridge, MA
September 1998 - May 1999. Undergraduate research opportunity program (UROP). Work included modeling and system identification of model parameters for control of a Holonomic Omnidirectional wheelchair.

Schlumberger Perforating and Testing Houston, TX
June - August 1998: Modeled the dynamic behavior of well perforating guns during an accidental drop and presented the design of a safety mechanism to reduce any damages.
June - August 1997: Assisted in the development of new techniques for the manufacture of perforating devices (Shape charges) to increase penetration depths.

MIT Ocean Engineering Towing Tank

Cambridge, MA

Fall 1996 - Fall 1998. Undergraduate research opportunity program (UROP). Work included machining, design and modification of robot parts for "Robopike" project.

Teaching Experience

MIT Mechanical Engineering Department

Cambridge, MA

Fall 2005-present: Supervising an undergraduate thesis in Mechanical Engineering.

Fall 2004, 2002, 2001, 2000: Teaching Assistant for *Elements of Mechanical Design* (2.72), taught weekly recitations and practice laboratory sessions. Prepared and graded quizzes and problem sets, 20 - 50 students.

Spring 2000: Teaching Assistant for *System Dynamics and Control* (2.004), taught weekly recitations and graded quizzes, 100 students.

Skills

Computer Skills: MATLAB, Mathematica, ProEngineer, SolidWorks, dSPACE, C, HTML.

Prototyping: Proficient machining with lathes, mills, waterjets and other shop machines, vacuum molding and composite part fabrication, casting and polymer molding.

Material characterization: Dynamical mechanical analyzer.

Languages: Fluent in English, Spanish and French.

Publications

- P. Valdivia y Alvarado, and K. Youcef-Toumi, "Design of Machines with Compliant Bodies for Biomimetic Locomotion in Liquid Environments", *ASME Journal of Dynamics Systems Measurement and Control*, **128**,3-13, March 2006.
- P. Valdivia y Alvarado, and K. Youcef-Toumi, "Performance of machines with flexible bodies designed for biomimetic locomotion in liquid environments", *Proc. IEEE International conference on robotics and automation (ICRA)*, Barcelona, Spain 2005.
- P. Valdivia y Alvarado, and K. Youcef-Toumi, "Modeling and design methodology for an efficient underwater propulsion system", *Proc. IASTED International conference on Robotics and Applications*, Salzburg, Austria 2003.

Patents

- Modeling and design methodology of an efficient underwater propulsion system and radio controlled submersible and maneuverable toy. U.S.S.N.: 60/582,566 (Provisional US patent application).
- Applicator. US patent 7,055,528.

Awards

- French Foreign Affairs Ministry Scholarship to continue superior studies in France. (Awarded to one student out of the entire graduating class).
- Machine developed in "Design and Manufacturing I (2.007)" was exposed at the museum of science as part of the ROBOTICS exposition (summer 1998).

Professional Affiliations

American Society of Mechanical Engineers (ASME)

Institute of Electrical and Electronic Engineers (IEEE)

Sigma Xi, The Scientific Research Society