Francisco Castro

Education

- Ph.D. Mechanical Engineering, University of Colorado at Boulder, 2009
- M.S. Mechanical Engineering, University of Colorado at Denver, 2003
- B.S. Mechanical Engineering, Pontifical Catholic University of Peru, 1997

Professional Recognition

- Mechanical Engineering Outstanding Ph.D. Dissertation, 2009

Research Interests

- Mechanical Characterization of Polymers
- Thermo-mechanical Behavior of Shape Memory Polymers
- Constitutive Model Implementation of Shape Memory Polymers

Selected Publications

- F. Castro, K.K. Westbrook, J. Hermiller, D.U. Ahn, Y. Ding, H.J. Qi, 2009. Time and Temperature Dependent Recovery of Epoxy-Based Shape Memory Polymers. Submitted.
- F. Castro, K.K. Westbrook, K.N. Long, R. Shandas, H.J. Qi, 2009. Effects of thermal rates on the thermomechanical behaviors of amorphous shape memory polymers. *Mech Time-Depend Mater*. Accepted.
- K.K. Westbrook, F. Castro, K.N. Long, A.J. Slifka, H.J. Qi, 2009. Improved testing system for thermomechanical experiments on polymers using uniaxial compression equipment. *Polymer Testing*. Accepted.
- T. D. Nguyen, H. J. Qi, F. Castro, K.N. Long, 2008. A thermoviscoelastic model for amorphous shape memory polymers: Incorporating structural and stress relaxation, *J. Mech. Phys. Solids*, 56: 2792-2814
- H.J. Qi, T.D. Nguyen, F. Castro, C. Yakacki, R. Shandas, 2008. Finite Deformation ThermoMechanical Behavior of Thermally Induced Shape Memory Polymers, *J. Mech. Phys. Solids*, 56:1730-1751.

FRANCISCO CASTRO
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EDUCATION

University of Colorado at Boulder Boulder, CO
Ph.D. in Mechanical Engineering (01/05-12/09)
Advisor: Professor Jerry Qi, Mechanical Engineering
Thesis: Thermo-Mechanical Behavior of Shape Memory Polymers

University of Colorado at Denver Denver, CO
M.Sc. in Mechanical Engineering (08/00-08/03)
Advisor: Professor Ronald Rorrer, Mechanical Engineering
Thesis: Measurement of Upper Extremity Performance as a Function of the Seating System

Pontifical Catholic University of Peru Lima, Peru
B. Sc. in Mechanical Engineering (03/92-08/97)
Ranked 14th/209 in Engineering School and 2nd/27 in Mechanical Engineering

PROFESSIONAL EXPERIENCE

University of Colorado at Boulder Boulder, CO
Graduate Research Assistant, Department of Mechanical Engineering (08/05-12/09)
Experimental and Theoretical research work on thermo-mechanical behavior of Shape Memory Polymers

University of Colorado at Denver Denver, CO
Graduate Research Assistant, Department of Mechanical Engineering (12/00-08/03)
Study involved testing upper extremity performance of subjects with Multiple Sclerosis

Pontifical Catholic University of Peru Lima, Peru
Field Engineer, Department of Mechanical Engineering (01/98-07/00)
Measurement, analysis and report of thermal data from industry

Americana de Aviacion Lima, Peru
Assistant Engineer, Department of Engineering (01/97-01/98)
Planning, performance and control of tasks related to aircraft maintenance checks

E. Wong Supermarkets Lima, Peru
Engineering Intern, Department of Engineering (01/96-03/96)
Maintenance and modification of refrigeration equipment

TEACHING EXPERIENCE

Mesa State College Grand Junction, CO
Instructor, Department of Mechanical Engineering Starting Fall 2010
Courses taught: Computational Methods and Circuits

University of Colorado at Boulder Boulder, CO
Instructor, Department of Mechanical Engineering Spring 2010
Courses taught: Dynamics and Senior Mechanical Eng. Laboratory

University of Colorado at Boulder Boulder, CO
Teaching Assistant, Department of Mechanical Engineering (08/05-08/08)
Courses included: Measurements Laboratory, Solid Mechanics (undergraduate and graduate levels), and Finite Element Analysis

University of Colorado at Boulder Boulder, CO
Tutor, College of Engineering and Applied Science (01/05-08/05)
Computational Methods (MCEN3030)

Pontifical Catholic University of Peru Lima, Peru
Laboratory Assistant, Department of Mechanical Engineering (07/04-12/04)
Implementation of experiments and maintenance equipment in the thermal laboratory

University of Colorado at Denver Denver, CO
Teaching Assistant, Department of Mechanical Engineering (08/00-12/00)
Engineering Graphics and Computer Aided Design

Pontifical Catholic University of Peru Lima, Peru
Laboratory Instructor/Grader, Department of Mechanical Engineering (08/95-07/00)
Supervision of students in the thermal laboratory

RESEARCH INTERESTS

Thermo-Mechanical Behavior of Shape Memory Polymers (SMP)
Mechanics of Reinforced SMP Composites

TEACHING INTERESTS

Solid Mechanics
Mechanical Behavior of Materials
Fluid Mechanics
Thermal Sciences

PUBLICATIONS-ACHIEVED JOURNALS

1. F. Castro, K.K. Westbrook, J. Hermiller, D.U. Ahn, Y. Ding, H.J. Qi, 2009. Time and Temperature Dependent Recovery of Epoxy-Based Shape Memory Polymers. Submitted.
2. F. Castro, K.K. Westbrook, K.N. Long, R. Shandas, H.J. Qi, 2009. Effects of thermal rates on the thermomechanical behaviors of amorphous shape memory polymers. *Mech Time-Depend Mater.* Accepted.
3. K.K. Westbrook, F. Castro,. K.N. Long, A.J. Slifka, H.J. Qi, 2009. Improved testing system for thermomechanical experiments on polymers using uniaxial compression equipment. *Polymer Testing.* Accepted.
4. T. D. Nguyen, H. J. Qi, F. Castro, K.N. Long, 2008. A thermoviscoelastic model for amorphous shape memory polymers: Incorporating structural and stress relaxation, *J. Mech. Phys. Solids,* 56: 2792-2814
5. 2. H.J. Qi, T.D. Nguyen, F. Castro, C. Yakacki, R. Shandas, 2008. Finite Deformation ThermoMechanical Behavior of Thermally Induced Shape Memory Polymers, *J. Mech. Phys. Solids,* 56:1730-1751.

CONFERENCE PROCEEDINGS

1. F. Castro, H. J. Qi, J. Hermiller, E. Havens. Time dependent thermo-mechanical behavior of thermally induced shape memory polymers. Proceedings of SPIE - The International Society for Optical Engineering, v 7290, 2009, Industrial and Commercial Applications of Smart Structures Technologies 2009. San Diego, CA.
2. H. J. Qi, F. Castro, J. Hermiller, E. Havens. Time dependent thermo-mechanical behavior of thermally induced shape memory polymers. Source: International SAMPE Symposium and Exhibition (Proceedings), v 54, 2009, SAMPE '09 Spring Symposium Conference Proceedings. Baltimore, MD.
3. F. Castro, H. J. Qi. Investigation of thermo-mechanical behavior of shape memory polymers. Society for Experimental Mechanics - SEM Annual Conference and Exposition on Experimental and Applied Mechanics 2009, v 3, p 1616-1620, 2009, Society for Experimental Mechanics - SEM Annual Conference and Exposition on Experimental and Applied Mechanics 2009. Albuquerque, NM.
4. H. J. Qi, F. Castro, K. N. Long. Finite Element Simulations of Thermally Induced Shape Memory Polymers Based Applications, in Proceedings of NSF CMMI Grantee Conference, Knoxville, TN.
5. H. J. Qi, M.L. Dunn, K. Long, F. Castro, R. Shandas, 2007. Thermomechanical Indentation of Shape Memory Polymers, in Behavior and Mechanics of Multifunctional and Composite Materials 2007, edited by M.J. Dapino, Proc. of SPIE v.6526, 652615. San Diego, CA.
6. F. Castro, R. A. L. Rorrer, D. J. Blake, D. D. Scott, P. M. Kennedy, T. Hearty, S. G. Fitzgerald. Measurement of Upper Extremity Performance as a function of the Seating System: A Comparison on People with Multiple Sclerosis, in 26th RESNA Annual Conference Proceedings, Atlanta, GA, June 2003.

PRESENTATIONS IN CONFERENCES

1. F. Castro, H. J. Qi, C. R. Shandas, 2008, Thermo-Mechanical Beh*avio*r of Thermally Induced Shape Memory Polymers, Society of Engineering Science, Urbana-Champaign, IL, October 20th, 2008.
2. F. Castro, K. N. Long, H. J. Qi, M.L. Dunn, R. Shandas, 2008, Thermo-Mechanical Modelling of Thermally Induced Shape Memory Polymers, CU-Industry Advisory Council Meeting, Boulder, CO, May, 2nd, 2008.
3. F. Castro, H. J. Qi, C. Yakacki, R. Shandas, 2007, Temperature Rate Effects on Thermally Induced Shape Memory Polymers, Society of Engineering Science, College Station, TX, October 22nd, 2007.

AWARD

Mechanical Engineering Outstanding Ph.D. Dissertation - Fall 2009

SKILLS

Computational
MS Office (Word, Excel and PowerPoint)
Abaqus, AutoCad, Pro-Mechanica, Matlab, Fortran, and SPSS

Languages
Fluent in Spanish