

Brent Louis Volk
224C WERC Building
Texas A&M University
College Station, TX 77843-3141

brentvolk@tamu.edu
<http://smart.tamu.edu>
Work: (979) 845-1576
Cell: (817) 713-1780

Curriculum Vitae

EDUCATION

Doctor of Philosophy, Materials Science and Engineering (2009 – Present)
Texas A&M University, College Station, TX

Master of Science, Aerospace Engineering (4.0/4.0) (2007 – 2009)
Texas A&M University, College Station, TX
Thesis Topic: *Thermomechanical Characterization and Model Calibration of Shape Memory Polymers*
Thesis Chair: Dr. Dimitris C. Lagoudas
Thesis Committee: Drs. Zoubeida Ounaies and Duncan Maitland
Recipient, National Science Foundation Integrative Graduate Education and Research Traineeship Fellowship

Bachelor of Science, Aerospace Engineering (3.62/4.0) (2003 – 2007)
Texas A&M University, College Station, TX
Minor – Mathematics
Cum Laude

PROFESSIONAL EXPERIENCE

Graduate Research Assistant (2007 – Present)
Aerospace Engineering Department, Texas A&M University

- Investigated thermomechanical characterization of shape memory polymers.
- Calibrated a constitutive model for the large deformations of shape memory polymers.
- Current research includes constitutive modeling of shape memory alloys.

Langley Aerospace Research Summer Scholar (Summer 2007)
NASA Langley Research Center, Hampton, VA

- Performed thermomechanical characterization of shape memory polymers, including investigating the dependence of the temperature rate on the shape memory effect.

Undergraduate Research Assistant (2005 – 2007)
Aerospace Engineering Department, Texas A&M University

- Performed thermomechanical characterization of shape memory alloys, high temperature shape memory alloys, and shape memory polymers.

Langley Aerospace Research Summer Scholar (Summer 2006)
NASA Langley Research Center, Hampton, VA

- Performed experimental characterization of shape memory polymers, including investigating the shape memory effect for large deformations.

RESEARCH INTERESTS

- Thermomechanical characterization of active materials, including shape memory alloys and shape memory polymers
- Constitutive modeling of shape memory materials
- Implementation of constitutive models into a finite element framework

JOURNAL PUBLICATIONS IN PREPARATION

1. B. Volk, D. Lagoudas, Y. Chen, *Thermomechanical Characterization of a Shape Memory Polymer*, In preparation.
2. B. Volk, D. Lagoudas, Y. Chen, *Calibration of a Large Deformation, Thermoelastic Model for Shape Memory Polymers*, In preparation.

PAPERS IN CONFERENCE PROCEEDINGS

1. B. Volk, D. Lagoudas, Y. Chen, *Thermomechanical Characterization and Modeling of Shape Memory Polymers*, In Proceedings of International Conference on Adaptive Structures and Technologies, Ascona, Switzerland. 6-8 October 2008.
2. B. Volk, D. Lagoudas, Y. Chen, *Thermomechanical Characterization of the Nonlinear, Rate-Dependent Response of Shape Memory Polymers*, In Proceedings of SPIE Smart Structures/NDE Conference, San Diego, CA. 10-13 March 2008.
3. B. Volk, D. Lagoudas, Y. Chen, K. Whitley, *Characterization and Modeling of the Nonlinear Rate Dependent Response of Shape Memory Polymers*, In Proceedings of 6th International Symposium on Advanced Composites, Corfu, Greece. 16-18 May 2007.
4. D. Hartl, B. Volk, D. Lagoudas, F. Calkins, J. Mabe, *Thermomechanical Characterization and Modeling of Ni60Ti40 SMA for Actuated Chevrons*, In Proceedings of ASME 2006 International Mechanical Engineering Congress and Exposition, Chicago, IL. 5-10 November 2006.

PRESENTATIONS

Professional Conferences

1. *Thermomechanical Characterization and Model Calibration of Shape Memory Polymers*, University of Oregon Material Science Institute Retreat, Gleneden Beach, OR. 17 December, 2008.
2. *Thermomechanical Characterization and Model Calibration of Shape Memory Polymers*, ASME Smart Materials, Adaptive Structures, and Intelligent Systems, Ellicott City, MD. 30 October, 2008.
3. *Thermomechanical Characterization and Modeling of Shape Memory Polymers*, International Conference on Adaptive Structures and Technologies, Ascona, Switzerland. 8 October 2008.
4. *Thermomechanical Characterization of the Nonlinear, Rate-Dependent Response of Shape Memory Polymers*, SPIE Smart Structures/NDE Conference, San Diego, CA. 12 March 2008.

Student Conferences and Poster Sessions

1. *Thermomechanical Characterization of Shape Memory Polymers*, Student Research Week, Texas A&M University, College Station, TX. 25 March 2008.
2. *Characterization of High Temperature Shape Memory Alloys*, Undergraduate Summer Research Grant (USRG) Presentations, Texas A&M University, College Station, TX. 10 August 2005.

Informal Presentations

1. *Thermomechanical Characterization of the Nonlinear Rate-Dependent Response of Shape Memory Polymers*, Langley Aerospace Research Summer Scholars (LARSS) Presentations, NASA Langley Research Center, Hampton, VA. 7 August 2007.
2. *Characterization of Shape Memory Polymers*, Langley Aerospace Research Summer Scholars (LARSS) Presentations, NASA Langley Research Center, Hampton, VA. 9 August 2006.

TEACHING EXPERIENCE

Teaching Assistant – Undergraduate Courses

- AERO 404: Mechanics of Advanced Aerospace Structures (Fall 2008)
 - Generated homework assignment solutions.
 - Evaluated student performance on homework assignments and examinations.
 - Assisted Dr. Dimitris Lagoudas on a volunteer basis.
 - Course Data: 10 students, 1 hr lecture 3x per week.

AWARDS & HONORS

Graduate Awards

- National Science Foundation (NSF) Integrative Graduate Education and Research Traineeship (IGERT) Fellow (2007 – 2009)
- Best Student Contribution, International Conference on Adaptive Structures and Technologies (2008)
- First Place Research Presentation, Student Research Week (2008)
- Langley Aerospace Research Summer Scholar (Summer 2007)
- NSF Graduate Research Fellowship Program (GRFP) Honorable Mention (2007)

Undergraduate Awards

- Texas A&M Howdy Club Scholarship (2006 – 2007)
- Langley Aerospace Research Summer Scholar (Summer 2006)
- Who's Who Award in American Universities and Colleges (2006)
- Aggie Leadership Scholarship (2005 – 2006)
- Texas A&M University Honors Incentive Scholarship (2005 – 2006)
- Undergraduate Summer Research Grant (Summer 2005)
- Elected to Membership in: Tau Beta Pi, Sigma Gamma Tau (2005)
- Awarded Air Force Sergeant's Association Scholarship (2004 – 2005)
- Dwight Look College of Engineering Dean's List (2003 – 2005)

GRADUATE COURSES

- Continuum Mechanics (Dr. Dimitris Lagoudas)
- Fundamental Materials Science and Engineering (Dr. Xinghang Zhang)
- Introduction to Finite Element Method (Dr. John Whitcomb)
- Mathematical Foundation of Continuum Mechanics (Dr. Jay Walton)
- Mechanical Behavior of Materials (Dr. Ibrahim Karaman)
- Methods of Applied Mathematics (Dr. Jay Walton)
- Modeling of Inelastic Systems (Dr. Arun Srinivasa)
- Numerical Analysis (Dr. Guergana Petrova)
- Plasticity Theory (Dr. Amine Benzerga)
- Theory of Elasticity (Dr. Kumbakonam Rajagopal)

RELEVANT UNDERGRADUATE COURSES

- Aeroelasticity (Dr. Thomas Strganac)
- Aerospace Structural Design (Dr. Walter Haisler)
- Engineering Principles of Continuum Mechanics (Dr. Dimitris Lagoudas)
- Material Science for Engineers (Dr. Norris Stubbs)
- Mechanics of Advanced Aerospace Structures (Dr. John Whitcomb)
- Polymer Nanocomposites (Dr. Zoubeida Ounaies)
- Structural Analysis I (Dr. Vikram Kinra)
- Structural Analysis II (Dr. John Whitcomb)

LEADERSHIP POSITIONS

- Treasurer: Society of Engineering Sciences, Texas A&M University (2007 – 2008)
- Director: Aggie Fish Club, Texas A&M University (2005 – 2007)
- Counselor: Aggie Fish Club, Texas A&M University (2004 – 2005)
- Counselor: Fish Camp, Texas A&M University (Summer 2004)

SKILLS

Experimental – Material Testing Hardware

- MTS Hydraulic and Electromechanical Test Frames
- Differential Scanning Calorimetry
- Visual Image Correlation System

Computational

- Computer Languages – C++, FORTRAN, LaTeX
- Software – Maple, Matlab, AutoCAD, Solid Works, ABAQUS