

## EDWIN ALEXANDER PERAZA HERNANDEZ

### ADDRESS

Department of Aerospace Engineering  
Texas A&M University  
College Station, TX 77843

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### EDUCATION

TEXAS A&M UNIVERSITY, College Station, TX

*Ph.D. Aerospace Engineering*, January 2013 – Present

Current GPA: 4.0/4.0

Research area: Modeling and analysis of SMA-based self-folding systems

Advisors: Dr. Dimitris C. Lagoudas and Dr. Darren J. Hartl

TEXAS A&M UNIVERSITY, College Station, TX

*B.S. Aerospace Engineering*, Graduation: December 2012

GPA: 3.95/4.0

Minor: Mathematics

Honors: Aerospace with Honors Program, University Research Scholar

Honors undergraduate thesis: “Analysis of the size effects on the pseudoelastic behavior of shape memory alloy micropillars”, advised by Dr. Dimitris C. Lagoudas

### EXPERIENCE

#### GRADUATE RESEARCH ASSISTANT

Shape Memory Alloy Research Team, Texas A&M University, College Station, TX

January 2013 – Present

- Modeling and analysis of SMA-based self-folding systems

#### GRADER

Department of Aerospace Engineering, Texas A&M University, College Station, TX

September 2010 – May 2011, September 2012 – December 2012

- Graded AERO 304 “Structural Analysis I” (Fall 2012)
- Graded ENGR 112 “Foundations of Engineering II” (Fall 2010, Spring 2011). Collaborated in the implementation of shape memory alloys in the class project

#### UNDERGRADUATE RESEARCH ASSISTANT

Shape Memory Alloy Research Team, Texas A&M University, College Station, TX

September 2010 – December 2012

- Analysis and modeling of size effects on the behavior of shape memory alloy micro-pillars
- Fabrication and characterization of metal nanowires and nanowire-ceramic composites

#### SUMMER RESEARCH INTERN

Petroleum and Geosystems Engineering, The University of Texas at Austin, Austin, TX

June 2012 – August 2012

- Creation of a database of hydraulic fracturing fluid properties
- Creation of a general model of hydraulic fracturing fluid rheology as function of foam quality and proppant concentration

## GRADER

Department of Mathematics, Texas A&M University, College Station, TX  
September 2011 – May 2012

- Graded MATH 401 “Advanced Engineering Mathematics” (Spring 2012)
- Graded MATH 251 “Engineering Mathematics III” (Spring 2012)
- Graded MATH 308H “Honors – Differential Equations” (Fall 2011)

## UNDERGRADUATE RESEARCH ASSISTANT

Aerodynamics and Fluid Dynamics Laboratory, Texas A&M University, College Station, TX  
September 2010 – May 2011

- Programming LabVIEW codes that implemented a novel wing rate-free control law to suppress flutter
- Performance of wind tunnel testing using a nonlinear aeroelastic test apparatus (NATA)

## JOURNAL PUBLICATIONS

1. **Edwin A. Peraza Hernandez**, Darren J. Hartl, and Richard J. Malak, 2013, “Design and Numerical Analysis of an SMA Mesh-based Self-Folding Sheet,” *Smart Materials and Structures*, Vol. 22, pp. 094008
2. **Edwin A. Peraza Hernandez**, Darren J. Hartl, Edgar Galvan, and Richard J. Malak, 2013, “Design and Optimization of an SMA-based Self-Folding Sheet,” *ASME Journal of Mechanical Design*, Vol. 135, 111007-1
3. **Edwin A. Peraza Hernandez**, Shiyu Hu, Han W. Kung, Darren J. Hartl, and Ergun Akleman, 2013, “Towards Building Self-Folding Smart Structures,” *Computer and Graphics*, Vol. 37, Issue 6, 730 – 742. Winner of the Computer and Graphics SMI 2013 Best Paper Award (Honorable Mention)

## CONFERENCE PROCEEDINGS

1. **Edwin A. Peraza Hernandez**, Katherine R. Frei, Darren J. Hartl, and Dimitris C. Lagoudas, 2014, “Folding patterns and shape optimization using SMA-based self-folding laminates,” *Proceedings of SPIE Smart Structures/NDE 2014*, 9057 – 51, San Diego, California
2. **Edwin A. Peraza Hernandez**, Darren J. Hartl, Katherine R. Frei, and Ergun Akleman, 2014, “Connectivity of Shape Memory Alloy-based Self-Folding Structures,” *Proceedings of the 22nd AIAA/ASME/AHS Adaptive Structures Conference, in AIAA SciTech 2014*, No. 2014-1415, National Harbor, Maryland
3. **Edwin A. Peraza Hernandez**, Darren J. Hartl, and Dimitris C. Lagoudas, 2013, “Modeling of Shape Memory Alloy Wire Meshes using Effective Lamina Properties for Improved Analysis Efficiency,” *Proceedings of the ASME 2013 Conference on Smart Materials, Adaptive Structures and Intelligent Systems*, SMASIS2013-3094, Snowbird, Utah
4. Pingping Zhu, L. Catherine Brinson, **Edwin A. Peraza Hernandez**, Darren J. Hartl, and Aaron Stebner, 2013, “Comparison of Three-Dimensional Shape Memory Alloy Constitutive Models: Finite Element Analysis of the Actuation and Superelastic Responses of a Shape Memory Alloy Tube,” *Proceedings of the ASME 2013 Conference on Smart Materials, Adaptive Structures and Intelligent Systems*, SMASIS2013-3093, Snowbird, Utah
5. **Edwin A. Peraza Hernandez**, Darren J. Hartl, and Dimitris C. Lagoudas, 2013, “Shape Memory Alloy Laminate for Design of Self-Folding Reconfigurable Structures, Proceedings of the 19th International Conference on Composite Materials, Ottawa, Canada
6. **Edwin A. Peraza Hernandez**, Darren J. Hartl, and Richard J. Malak, 2013, “Simulation-based design of a self-folding smart material system,” *Proceedings of the ASME 2013 Inter-*

*national Design Engineering Technical Conference & Computers and Information in Engineering Conference (IDETC/CIE 2013)*, Portland, Oregon

7. Darren J. Hartl, **Edwin A. Peraza Hernandez**, and Dimitris C. Lagoudas, 2013, "Finite element analysis of the nonlinear dynamics of a shape memory alloy structure," *Proceedings of the XV International Symposium on Dynamic Problems of Mechanics (DINAME 2013)*, ABCM, Buzios, RJ, Brazil
8. Neha Satak, **Edwin A. Peraza Hernandez**, and John E. Hurtado, 2012, "Rate-free control of nonlinear wing section using pitch and plunge measurements only," *Proceedings of the 53rd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, Honolulu, Hawaii
9. **Edwin A. Peraza Hernandez**, Kaushik Das, and Dimitris C. Lagoudas, 2012, "Mechanical characterization of Sn and shape memory alloy InTl nanowires as part of an undergraduate research experience," *Proceedings of the ASEE 119th Annual Conference and Exposition, Division: Aerospace*, San Antonio, Texas

## SKILLS

- Fluent in English and Spanish
- Software: MATLAB, Maple, C++, Solidworks, Microsoft Office Suite (Excel, Word, PowerPoint), StimPlan, ABAQUS, ModelCenter, and LaTeX
- Lab equipment: Field Emission Scanning Electron Microscope (SEM), Energy Dispersive Spectroscopy (EDS), Spectrophotometer (UV-vis-NIR), and Nanoindenter

## HONORS AND AWARDS

- The Computer and Graphics SMI 2013 Best Paper Award (Honorable Mention)
- TAMU Undergraduate Research Honors Fellow
- Engineering Scholars Program Honors Certificate
- Second place Student Research Week 2012, Category: Undergraduate Engineering Poster
- Aerospace Scholars Summer Research Grant (Summer 2011)
- The Dwight Look College of Engineering "Dean's Honor Roll" Designation (Fall 2009 – Fall 2012)
- Recipient of the Keys to Aggieland Scholarship
- Recipient of the Presidential Scholarship of El Salvador
- Awarded with the Outstanding Youth Prize of El Salvador. Category: Academic Excellence

## ORGANIZATIONS

- Tau Beta Pi - Engineering Honor Society
- Phi Kappa Phi
- Sigma Gamma Tau – Aerospace Engineering Honor Society
- Golden Key International Honor Society
- Phi Eta Sigma – Freshman Honor Society
- El Salvador Student Association at TAMU (Member, 2009 – 2011)