

Darren J. Hartl, Ph.D.

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Education

Ph.D. Aerospace Engineering, Texas A&M University, December 2009
Dissertation: *Modeling of Shape Memory Alloys Considering Rate-Independent and Rate-Dependent Irrecoverable Strains*, Advisor: Dimitris C. Lagoudas
GPR: 4.00
B.S. Aerospace Engineering, Texas A&M University, May 2004
GPR: 3.94, *Summa Cum Laude*

Employment/Appointments

Texas A&M University, College Station, TX

Assistant Professor, Dept. of Aerospace Engineering, Aug. 2016–present
TEES Research Assistant Professor, Dept. of Aerospace Engineering, Apr. 2011–Jul. 2016
Assistant Director, Aerospace Vehicles Systems Institute, Dec. 2012–Sep. 2014
Director of Operations, Texas Institute for Intelligent Materials and Structures (TiiMS),
July 2012–Sep. 2014
Senior Research Associate, Dept. of Aerospace Engineering, Oct. 2009–Mar. 2011

Air Force Research Labs, Wright-Patterson AFB, Dayton, OH

Distinguished Engineer, RXCC (Universal Technology Corporation), Oct. 2015–Aug. 2016
Visiting Researcher, RQVC, Dec. 2014–Aug. 2016
Research Scientist, RXCC (UES, Inc.), Oct. 2014–Oct. 2015

Technical University Dortmund, Dortmund, Germany

Visiting Scholar, Institute for Mechanics, June 1–30 2012

American Airlines, Fort Worth, TX

Power Plant Engineer - Co-op, May–Dec. 2002
Structures Engineer - Co-op, June–Dec. 2001

Awards and Honors

- *Ephraim Garcia Best Paper Award*
presented by ASME Adaptive Structures and Material Systems Branch, 2018
- *Dean of Engineering Excellence Award*
presented by Dean of the Texas A&M University College of Engineering, 2018
- *Outstanding Technical Paper Award (Third Place)*,
presented at SAMPE 2017

- *Gary Anderson Early Achievement Award*, presented by ASME Aerospace Division, 2016
- Member, *Distinguished Aerospace Engineering Alumni Academy*, presented by Texas A&M University Department of Aerospace Engineering, 2015
- *Outstanding Young Aerospace Engineer Award*, presented by Texas A&M University Department of Aerospace Engineering, 2015
- *Best Student Paper/Presentation Award, 2nd Place (Advisor)*, presented by ASME at SPIE Smart Conference, 2015
- *Engineering Genesis Award for Multidisciplinary Research (Team Member)*, presented by Texas A&M Engineering Experimentation Station (TEES), 2014
- *The Computer and Graphics SMI 2013 Best Paper Award (Honorable Mention)*, presented by *Computer and Graphics*, 2013
- *Distinguished Graduate Student Award for Excellence in Doctoral Research* presented by Texas A&M University Association of Former Students, 2010
- *Best Student Paper/Presentation Award*, presented by ASME at SPIE Smart Structures Conference, 2009
- *2008 Best Paper Award*, presented at ASME-SMASIS Conference, 2008
- *William Sweet Smith Prize* presented for best aerospace paper, Journal of the Institute of Mechanical Engineers, 2007
- *Best Student Paper/Presentation Award (Honorable Mention)* presented by ASME at SPIE Smart Structures Conference, 2008
- *NSF Integrative Graduate Education and Research Traineeship (IGERT) Fellowship*, 2007–2009
- *National Defense Science and Engineering Grant (NDSEG) Fellowship*, 2004 – 2007
- *Outstanding Senior Award* presented by Sigma Gamma Tau to the regional senior of the year (1 of 6 nationwide), 2004
- *Stan H. Lowy Award for Excellence in Airplane Design*, 2004
- Tau Beta Pi – Engineering Honor Society
- Sigma Gamma Tau – Aerospace Engineering Honor Society
- Phi Kappa Phi

I. Teaching/Advising

I.1. Academic Courses

- *Mechanics of Active Materials* (Graduate)
- *Aerospace Structural Analysis II* (Undergraduate)
- *Aerospace Structural Design* (Undergraduate)
- *Design for Unconventional Applications of Aerospace Skills* (Undergraduate)

I.2. Short Courses

1. *Introduction to Shape Memory Alloys*, The Boeing Company, Seattle, Washington, March 2009.
2. *Derivation and Implementation of Shape Memory Alloy Constitutive Models*, Department of Mechanical Engineering and Aeronautics, The University of Patras, September 2009.
3. *Materials Simulation at the Continuum Level*, IIMEC Winter School 2012, Texas A&M University, College Station, TX, January 2012 (20 students).
4. *Introduction to the Modeling and Analysis of Active Materials*, Doctoral Training Centre, Advanced Composites Centre for Innovation and Science, Bristol University, Bristol, UK, November 2012 (12 students).
5. *Continuum Response of Microstructures*, IIMEC Summer School 2014, Texas A&M University, College Station, TX, June 2014 (20 students).
6. *Introduction to the Modeling and Analysis of Active Materials*, Doctoral Training Centre, Advanced Composites Centre for Innovation and Science, Bristol University, Bristol, UK, July 2017 (15 students).
7. *Introduction to the Modeling of Active Materials*, Bernal Institute, University of Limerick, Limerick, Ireland, July 2017 (15 students).
8. *Introduction to the Modeling and Analysis of Active Materials*, AAC Technologies, Inc., University of Nanjing, Nanjing, China, June 2018 (20 students).

I.3. Post-Doctoral Researchers Advised

- Edwin Peraza Hernandez (04/01/2017 – 08/01/2017)
- Mirmilad Mirsayar (06/01/2017 – present)
- Sameer Jape (06/01/2017 – present)

I.4. Graduate Students Advised

Masters of Science

- Stephen Oehler, *Developing Methods for Designing Shape Memory Alloy Actuated Morphing Aerostructures* (December 2012; co-advised w/ Lagoudas*)
- Stephen Cornell, *Experimental Characterization of Shape Memory Alloys Using Digital Image Correlation and Infra-Red Thermography* (May 2015; co-advised w/ Lagoudas*)
- Aaron Powledge, *Experimental Characterization and Validated Multi-Fidelity Analysis of the Curvature of Shape Memory Alloy Composite Sheets* (May 2015; co-advised w/ Malak)
- Tyler Halbert, *IGP: An Improved Algorithm for Sequential Information Gathering Decisions in Design Under Uncertainty* (May 2015; co-advised w/ Malak)
- **Christopher Bertagne, *Experimental Evaluation of an Analysis Framework for Simulating the Coupled Behavior of Shape Memory Alloy-Based Morphing Radiators* (August 2016; co-advised w/ Whitcomb*)
- †Brent Bielefeldt, *Computational Analysis of Shape Memory Alloy Sensory Particles for Structural Health Monitoring Applications* (August 2016); co-advised w/ Benzerga*)
- ***William Scholten *Analysis and Wind Tunnel Testing of a SuperElastic Slat-Cove Filler For Airframe Noise Reduction* (December 2016)
- Doe Young Hur (August 2017, co-advised with Malak)

- Ryan Patterson *The Effects of a SMA-based Slat Cove Filler on the Aerodynamic and Structural Characteristics of a Wing Prototype* (December 2017)
- Jacob Mingear *The Integration of Gallium-Based Liquid Metal Energy Circuits into Additively Manufactured Shape Memory Alloy Actuators for Increased Actuation Frequencies* (August 2018)
- Patrick Walgren (May 2019 expected; committed to Ph.D.)
- Allen Davis (December 2019 expected; committed to Ph.D.)
- Hannah Stroud (May 2020 expected; committed to Ph.D.)
- Gregory Wilson (May 2020 expected)
- Andrew Leaton (May 2020 expected)
- Madalyn Mikkelsen (December 2020 expected)
- Michayal Mathew (December 2020 expected)

Doctor of Philosophy

- Edwin Peraza Hernandez *Kinematics, Structural Mechanics, and Design of Origami Structures with Smooth Folds* (December 2017 expected; co-advised w/ Lagoudas)
- †Brent Bielefeldt (December 2019 expected)
- Pedro Camara Leal (December 2019 expected)
- ***William Scholten (December 2019 expected)
- Jacob Mingear (August 2021 expected)

*“Research Faculty” appointment allowed co-advisor status only; these students recruited, fully supported, and primarily technically advised by Hartl; **NASA Space Technology Research Fellow (NSTRF); ***NSF Graduate Research Fellow; †DoD SMART Fellow selection

I.5. Graduate Student Committees

Masters of Science

Isaac Reese (May 2013, MEEN); Shane Bearrow (May 2013, ARCH); Benita Mordi (December 2015, ISEN); Rajiv Jay (December 2015, ELEN); John Rohmer (August 2016, AERO); Alim Kim (August 2017, AERO); Neil Jog (August 2017, MEEN); Collin Blake (AERO); Yasushi Mizuno (MEEN); Inderdeep Singh (ELEN); Joshua Ruff (ELEN)

Doctor of Philosophy

Edgar Galvan (August 2016, MEEN); Robert Wheeler (May 2017, AERO); Francis Phillips (AERO); Kenneth Cundiff (December 2018 expected, AERO); Joshua Herrington (May 2019 expected; AERO); Pawan Chaugule (AERO); Lei Xu (AERO); Radhakrishnan Vigneshwaran (AERO)

I.6. Undergraduate Research for Credit Mentees

Judy Santa Cruz (Summer & Fall 2012); Klaus Lima (Fall 2012); William Scholten (Honors, Spring 2013); Flavia Ohara (Spring & Summer 2013); Christopher Bertgane (Honors, Fall 2013); Daniel Whitten (Honors, Fall 2013); Joshua Herrington (Honors, Spring 2014); Logan Hodge (Honors, Spring 2014); Nicholas Page (Honors, Spring 2016); Matthew Wescott (Fall 2016); Jorge Chong (Honors, Spring 2017); Lane Kirstein (Honors, Spring 2017); Luis

Gonzalez (Spring 2017); Elise Kooock (Spring 2017); Madalyn Mikkelsen (Spring 2017); Brady Allen (Honors, Spring and Fall 2018, Spring 2019); Keval Shah (Honors, Spring 2018); Sebastian Cook (Spring 2018); Mitchell Mu (Honors, Fall 2018); Ryan Lotz (Honors, Spring 2019); Jacob Schrass (Honors, Spring 2019)

I.7. Visiting Student Scholar Mentees

Bachelors Thesis / Masters of Science

Florent Righi (École Supérieure des Sciences et Techniques de l'Ingénieur de Nancy, Mar–Aug 2012); Robin Schulte (Technical University Dortmund, Aug–Oct 2013); Thibaut Brosse (Ecole nationale d'Ingénieurs de Saint-Etienne (ENISE), Feb–Aug 2014); Fan Fei (Harbin Institute of Technology, Feb–Jun 2014); Clément Nony-Davadie (Arts et Métiers Paris-Tech), May–Sept 2014); Jeff Volpi (Ecole nationale d'Ingénieurs de Saint-Etienne (ENISE), Sep 2015–Jan 2016); Quentin Chapelon (Ecole nationale d'Ingénieurs de Saint-Etienne (ENISE), Feb 2016–Jun 2016); Gregory Methon (Ecole nationale d'Ingénieurs de Saint-Etienne (ENISE), Feb 2017–Jul 2017); Antoine Baldo (Ecole nationale d'Ingénieurs de Saint-Etienne (ENISE), Sept 2017–Jan 2018); Thomas Thollot (Ecole nationale d'Ingénieurs de Saint-Etienne (ENISE), Sept 2017–Jan 2018)

Doctor of Philosophy

Alex Solomou (University of Patra, Jun-Aug 2011, Jun-Aug 2014); Theodoros Machairas (University of Patra, Jun-Aug 2012); Giulia Scalet (University of Pavia, Jun-Aug 2013)

II. Research (*h-index: 20, i-10 index: 41, Google Scholar 2/10/2019*)

II.1. Books

1. E. Peraza Hernandez, D. Hartl, D. Lagoudas, *Active Origami: Modeling, Design, and Applications*, Springer, 2018.

II.2. Book Chapters

1. D. Hartl, D. Lagoudas, *Thermomechanical Characterization of Shape Memory Alloys*, In D. Lagoudas (Ed.), *Shape Memory Alloys: Modeling and Engineering Applications*, Springer, 2008, pp. 55–124.
2. M. Qidwai, D. Lagoudas, D. Hartl, *Numerical Implementation of an SMA Thermomechanical Constitutive Model Using Return Mapping Algorithms*, In D. Lagoudas (Ed.), *Shape Memory Alloys: Modeling and Engineering Applications*, Springer, 2008, pp. 193–236.
3. J. Schick, D. Hartl, D. Lagoudas, *Incorporation of Shape Memory Alloy Actuators into Morphing Aerostructures*, In J. Valasek (Ed.), *Morphing Aerospace Vehicles and Structures*, Wiley, 2012

II.3. Papers in Refereed Journals

1. D. Hartl, D. Lagoudas, *Aerospace Applications of Shape Memory Alloys*, Proceedings of the Institution of Mechanical Engineers, Part G, Journal of Aerospace Engineering, Vol. 221 (Winner of the William Sweet Smith Prize), pp. 535–552, 2007.
2. D. Hartl, D. Lagoudas, *Constitutive Modeling and Structural Analysis Considering Simultaneous Phase Transformation and Plastic Yield in Shape Memory Alloys*, Smart Materials and Structures, Vol. 18, No. 10, 2009. (*IF: 2.91*)

3. D. Hartl, D. Lagoudas, J. Mabe, F. Calkins, *Use of Ni60Ti Shape Memory Alloy for Active Jet Engine Chevron Application, Part I: Thermomechanical Characterization*, Smart Materials and Structures, Vol. 19, No. 1, 2010. (IF: 2.91)
4. D. Hartl, J. Mooney, D. Lagoudas, J. Mabe, F. Calkins, *Use of Ni60Ti Shape Memory Alloy for Active Jet Engine Chevron Application, Part II: Experimentally Validated Numerical Analysis*, Smart Materials and Structures, Vol. 19, No. 1, 2010. (IF: 2.91)
5. D. Hartl, G. Chatzigeorgiou, D. Lagoudas, *Three-Dimensional Modeling and Numerical Analysis of Rate-Dependent Irrecoverable Deformation in Shape Memory Alloys*, International Journal of Plasticity, Vol. 26, No. 10, pp. 1485–1507, 2010. (IF: 5.70)
6. D. Hartl, D. Lagoudas, F. Calkins, *Advanced Methods for the Analysis, Design, and Optimization of SMA-Based Aerostructures*, Smart Materials and Structures, Vol. 20, 094006, 2011. (IF: 2.91)
7. D. Lagoudas, D. Hartl, Y. Chemisky, L. Machado, P. Popov, *Constitutive Model for the Numerical Analysis of Phase Transformation in Polycrystalline Shape Memory Alloys*, International Journal of Plasticity, Vol. 32–33, pp. 155–183, 2012. (IF: 5.70)
8. S. Oehler, D. Hartl, R. Lopez, R. Malak, D. Lagoudas, *Design Optimization and Uncertainty Analysis of SMA Morphing Structures*, Smart Materials and Structures. Vol. 21, No. 9, 2012. (IF: 2.91)
9. E. Peraza-Hernandez, S. Hu, H-W. Kung, E. Akleman, D. Hartl, *Towards Building Smart Self-Folding Structures*, Computers and Graphics, Vol. 37, No. 6, (Winner of the Computers and Graphics SMI 2013 Best Paper Award, Honorable Mention), 2013.
10. E. Peraza-Hernandez, D. Hartl, R. Malak, *Design and Optimization of an SMA-Based Self-Folding Sheet*, ASME Journal of Mechanical Design, Vol. 135, No. 11, p. 111007, 2013. (IF: 2.57)
11. E. Peraza-Hernandez, D. Hartl, R. Malak, *Design and Numerical Analysis of an SMA Mesh-based Self-Folding Sheet*, Smart Materials and Structures, Vol. 22, 094008, 2013. (IF: 2.91)
12. G. Esquivel, D. Hartl, D. Whitten, *POP-OP: A Shape Memory-Based Morphing Wall*, International Journal of Architectural Computing, Vol. 11, No. 3, 2013.
13. E. Peraza-Hernandez, D. Hartl, R. Malak, D. Lagoudas, *Origami-Inspired Active Structures: A Synthesis and Review*, Smart Materials and Structures (special issue), Vol. 23, No. 9, 2014. (IF: 2.91)
14. D. Hartl, J. Mabe, O. Benafan, A. Coda, B. Conduit, R. Padan, B. Van Doren, *Standardization of Shape Memory Alloy Test Methods Toward Certification of Aerospace Applications*, Smart Materials and Structures, Vol. 24, No. 8, 2015. (IF: 2.91)
15. E. Peraza-Hernandez, B. Kiefer, D. Hartl, A. Menzel, D. Lagoudas, *Analytical Investigation of Structurally Stable Configurations in Shape Memory Alloy-Actuated Plates*, International Journal of Solids and Structures, Vol. 69–70, pp. 442–458, 2015. (IF: 2.76)
16. W. Scholten, D. Hartl, T. Turner, R. Kidd, *Development and Analysis-Driven Design Optimization of an SMA-Based Slat-Cove Filler for Airframe Noise Reduction*, AIAA Journal, Vol. 54, No. 3, 2016. (IF: 1.17)
17. D. Hartl, E. Galvan, R. Malak, J. Baur *Parameterized Design Optimization of a Magneto-hydrodynamic Liquid Metal Active Cooling Concept*, ASME Journal of Mechanical Design, Vol. 138, No. 3, pp. 031402-1–031402-11, 2016. (IF: 2.57)

18. G. Scalet, F. Auricchio, D. Hartl *Efficiency and Effectiveness of Implicit and Explicit Approaches for the Analysis of Shape Memory Alloy Bodies*, Journal of Intelligent Materials Systems and Structures, Vol. 27, No. 3, pp. 384–402, 2016. (IF: 2.26)
19. E. Peraza Hernandez, D. Hartl, R. Malak, Jr., E. Akleman, O. Gonen, H-W. Kung, *Design Tools for Patterned Self-Folding Reconfigurable Structures Based on Programmable Active Laminates*, Journal of Mechanisms and Robotics, Vol. 8, No. 3, pp. 031015-1–031015-12, 2016. (IF: 1.14)
20. R. Saunders, J. Boyd, D. Hartl, J. Brown, F. Calkins, D. Lagoudas, *A Validated Model for Induction Heating of Shape Memory Alloy Actuators*, Smart Materials and Structures, Vol. 25, No. 4, 2016. (IF: 2.91)
21. D. Hartl, G. Frank, J. Baur, *Effects of Microchannels on the Mechanical Performance of Multifunctional Composite Laminates with Unidirectional Laminae*, Composite Structures, Vol. 143, No. 5, 2016. (IF: 3.32)
22. E. Peraza Hernandez, D. Hartl, E. Akleman, D. Lagoudas, *Modeling and Analysis of Origami Structures with Smooth Folds*, Computer-Aided Design, Vol. 78. pp. 93-106, 2016.
23. E. Peraza Hernandez, D. Hartl, D. Lagoudas, *Kinematics of Origami Structures with Smooth Folds*, Journal of Mechanisms and Robotics, Vol. 8, No. 6, 2016. (IF: 1.14)
24. T. Halbert, E. Peraza-Hernandez, R. Malak, D. Hartl, *Numerically Validated Reduced-Order Model for Laminates Containing Shape Memory Alloy Wire Meshes*, Journal of Intelligent Materials Systems and Structures, Vol. 27, No. 11, pp. 1492–1509, 2016. (IF: 2.26)
25. A. Solomou, T. Machairas, D. Saravanos, D. Hartl, and D. Lagoudas, *A Coupled Layered Thermomechanical Shape Memory Alloy Beam Element with Enhanced Higher Order Temperature Field Approximations*, Journal of Intelligent Materials Systems and Structures, Vol. 27, No. 17, pp. 359–2384, 2016. (IF: 2.26)
26. D. Hartl, G. Frank, G. Huff, J. Baur, *A Liquid Metal-Based Structurally Embedded Vascular Antenna: I. Concept and Multiphysical Modeling*, Smart Materials and Structures, Vol. 26, No. 2, 2017. (IF: 2.91)
27. D. Hartl, G. Frank, R. Malak, J. Baur, *A Liquid Metal-Based Structurally Embedded Vascular Antenna: II. Multiobjective and Parameterized Design Exploration*, Smart Materials and Structures, Vol. 26, No. 2, 2017. (IF: 2.91)
28. T. Bertagne, D. Hartl, T. Cognata, R. Sheth, C. Dinsmore, *Testing and Analysis of a Morphing Radiator Concept for Thermal Control of Crewed Space Vehicles*, Applied Thermal Engineering, Vol. 124, pp. 986–1002, 2017 (IF: 3.44)
29. G. Huff, H. Pan, D. Hartl, G. Frank, R. Bradford, J. Baur, *A Physically Reconfigurable Structurally Embedded Vascular Antenna (SEVA)*, IEEE Transactions on Antennas and Propagation, Vol. 65, No. 5, pp. 2282–2288, 2017. (IF: 2.053)
30. D. Hartl, G. Frank, J. Baur, *Embedded Magnetohydrodynamic Liquid Metal Thermal Transport: Validated Analysis and Design Optimization*, Journal of Intelligent Materials Systems and Structures, Vol. 28, No. 7, pp. 862–877, 2017. (IF: 2.26)
31. E. Peraza Hernandez, D. Hartl, D. Lagoudas, *Design and simulation of origami structures with smooth folds*, Proceedings of the Royal Society A, Vol. 473, No. 2200, 2017. (IF: 1.94)
32. D. Hartl, J. Mingear, B. Bielefeldt, J. Rohmer, J. Zamarripa, A. Elwany, *High Frequency Shape Memory Alloy Actuators Incorporating Liquid Metal Energy Circuits*, Shape Memory and Superelasticity, Vol. 3, No. 4, pp. 457–466, 2017.

33. B. Bielefeldt, J. Hochhalter, D. Hartl, *Shape Memory Alloy Sensory Particles for Damage Detection: Experiments, Analysis, and Design Studies*, Structural Health Monitoring, Vol. 17, No. 4, pp. 777–814, 2017. (IF: 3.193)
34. E. Galvan, D. Hartl, J. Baur, R. Malak, *Performance Assessment of a Multi-objective Parametric Optimization Algorithm with Application to a Multi-physical Engineering System*, Structural and Multidisciplinary Optimization, Vol. 58, pp. 489–509, 2018. (IF: 2.21)
35. P. Walgren, C. Bertagne, M. Wescott, O. Benafan, L. Erickson, J. Whitcomb, and D. Hartl, *Development and Testing of a Shape Memory Alloy-Driven Composite Morphing Radiator*, Shape Memory and Superelasticity, Vol. 4, No. 1, pp. 232–241, 2018.
36. R. Saunders, J. Boyd, D. Hartl, F. Calkins, D. Lagoudas, *A Simplified Model for High Rate Actuation of Shape Memory Alloy Torque Tubes Using Induction Heating*, Journal of Intelligent Materials Systems and Structures, Vol. 29, No. 6, pp. 1088–1101, 2018. (IF: 2.26)
37. D. Hartl, B. Kiefer, R. Schulte, A. Menzel, *Computationally-Efficient Modeling of Inelastic Single Crystal Responses via Anisotropic Yield Surfaces: Applications to Shape Memory Alloys*, International Journal of Solids and Structures, Vol. 136–137, pp. 38–59, 2018. (IF: 2.76)
38. C. Bertagne, P. Walgren, L. Erickson, R. Sheth, J. Whitcomb, D. Hartl, *Coupled Behavior of Shape Memory Alloy-Based Morphing Spacecraft Radiators: Experimental Assessment and Analysis*, Smart Materials and Structures, Vol. 27, 065006, 2018. (IF: 2.91)
39. Y. Chemisky, D. Hartl, and F. Meraghni, *Three-Dimensional Constitutive Model for Structural and Functional Fatigue of Shape Memory Alloy Actuators*, International Journal of Fatigue, Vol. 112, pp. 263–278, 2018. (IF: 2.90)
40. P. Camara Leal, M. Savi, D. Hartl, *Optimization of Shape Memory Alloy-based Morphing Wing Using Class/Shape Transformations*, Proceedings of the Institution of Mechanical Engineers, Part G, Journal of Aerospace Engineering, Vol. 232, No. 15, pp. 2745–2759, 2018.
41. A. Gillman, G. Wilson, K. Fuchi, D. Hartl, A. Pankonien, P. Buskohl, *Design of Soft Origami Actuators with Targeted Symmetries*, Actuators, Vol. 8, No. 1, 2019.
42. P. Camara Leal, D. Hartl, *Structurally Consistent Class/Shape Transformation Equations for Morphing Airfoils*, AIAA Journal of Aircraft, (published online), 2018.
43. B. Bielefeldt, E. Akleman, G. Reich, P. Beran, D. Hartl, *L-System-Generated Mechanism Topology Optimization Using Graph-Based Interpretation*, Journal of Mechanisms and Robotics, (published online), 2019. (IF: 1.14)
44. M. Mirsayar, D. Hartl, *On the validity of strain energy density criterion for mixed mode I/II fracture analysis of notched shape memory alloy components*, Engineering Fracture Mechanics, (available online), 2019. (IF: 2.58)
45. B. Bielefeldt, D. Hartl, P. Beran, G. Reich, *Development and Validation of a Genetic L-System Programming Framework for Topology Optimization of Multifunctional Structures*, Computers and Structures, (accepted, in press), 2019.
46. J. Mingear, B. Zhang, D. Hartl, and A. Elwany, *L-PBF Process Parameters on Interior Channel Surface Roughness of As-Fabricated and Electropolished NiTi*, Additive Manufacturing, (accepted pending revision), 2019.
47. M. Mirsayar, D. Hartl, *On the cracks normal to shape memory alloy/elastic material interfaces*, Engineering Fracture Mechanics, (accepted pending revision), 2019.

*Special Advised Articles

- D. Whitten, *The Pop-Op Morphing Wall: A Fusion of Engineering and Art*, Explorations: The Texas A&M Undergraduate Journal, Vol. 5, pp.53–56, Fall 2013.

*strictly reviewed articles that require single student researcher authorship

II.4. Papers in Conference Proceedings

1. D. Hartl, B. Volk, D. Lagoudas, F. Calkins, J. Mabe, *Thermomechanical Characterization and Modeling of Ni60Ti40 SMA for Actuated Chevrons*, In Proceedings of IMECE 2006 Conference, Nov. 2006, Chicago, pp.1-10.
2. D. Hartl, D. Lagoudas, *Characterization and 3-D Modeling of Ni60Ti SMA for Actuation of a Variable Geometry Jet Engine Chevron*, In Proceedings of SPIE Smart Structures and Materials/NDE Conference, San Diego, March 2007, pp.1-12.
3. D. Hartl, D. Lagoudas, *Simultaneous Transformation and Plastic Deformation in Shape Memory Alloys*, In Proceedings of SPIE Smart Structures and Materials/NDE Conference, San Diego, March 2008, pp.1-12.
4. D. Hartl, D. Lagoudas, *Experimentally Validated Numerical Analysis of Aerostructures Incorporating Shape Memory Alloys*, In Proceedings of SPIE Smart Structures and Materials/NDE Conference, San Diego, March 2008, pp.1-12.
5. D. Hartl, D. Lagoudas, *Analysis of Simultaneous Transformation and Plastic Deformation in Shape Memory Alloys*, In Proceedings of the 19th International Conference on Adaptive Structures and Technologies, Ascona, Switzerland, October, 2008, pp.1-12.
6. D. Hartl, J. Mooney, D. Lagoudas, *Numerically Implemented Constitutive Model for SMA Applications Experiencing General Loads Resulting in Plastic Deformation and Large Rotations*, In Proceedings of ASME 2008 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Ellicott City, MD. October 2008.
7. D. Hartl, D. Lagoudas, *Experimental Investigation and 3-D Modeling of Rate-Dependent Irrecoverable Deformation in Shape Memory Alloys*, In Proceedings of SPIE Smart Structures and Materials/NDE Conference, San Diego, March 2009, pp.1-12.
8. D. Hartl, D. Lagoudas, *Modeling of Stress Concentrations in SMA Components Considering Plastic and Viscoplastic Yielding*, In Proceedings of 50th AIAA Structures, Structural Dynamics, and Materials Conference, Palm Springs, California, March 2009, pp.1-8.
9. D. Hartl, S. Oehler, D. Lagoudas, *Constitutive Modeling of Phase Transformation and Plastic Yield in SMAs: Application to the S3T-RoundRobin*, In Proceedings of ESOMAT 2009 Conference, Prague, Czech Republic, September 2009, pp. 1–7.
10. D. Hartl, G. Chatzigeorgiou, D. Lagoudas, *Three-Dimensional Modeling of Rate-Dependent Deformation in Shape Memory Alloys at High Temperatures*, In Proceedings of SMASIS 2009 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Oxnard, California, September 2009, pp. 1–8.
11. D. Lagoudas, G. Chatzigeorgiou, D. Hartl, P. Kumar, *Coexistence of Creep and Transformation in High Temperature Shape Memory Alloys*, In Proceedings of IMECE 2009 ASME International Mechanical Engineering Congress & Exposition, Lake Buena Vista, Florida, November 2009, pp. 1–7.

12. J. Nolan, D. Hartl, D. Lagoudas, *3-D Finite Element Analysis of Indentation Recovery due to the Shape Memory Effect* In Proceedings of SPIE Smart Structures and Materials/NDE Conference, San Diego, March 2010, pp. 1–10.
13. L. Gravatt, J. Mabe, F. Calkins, D. Hartl, *Characterization of Varied Geometry Shape Memory Alloy Beams* In Proceedings of SPIE Smart Structures and Materials/NDE Conference, San Diego, March 2010, pp. 1–12.
14. D. Hartl, T. Zimmerman, M. Dilligan, J. Mabe, F. Calkins, *Analysis of Shape Memory Alloy Components Using Beam, Shell, and Continuum Finite Elements*, In Proceedings of SMASIS 2010 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Philadelphia, Pennsylvania, September–October 2010, pp. 1–11.
15. S. Oehler, D. Hartl, D. Lagoudas, *Analysis and Optimization of Improved Hybrid SMA Flexures for High Rate Actuation* In Proceedings of SPIE Smart Structures and Materials/NDE Conference, San Diego, March 2011, pp. 1–12.
16. S. Oehler, D. Hartl, D. Lagoudas, R. Malak, *Design Optimization of a Shape Memory Alloy Actuated Morphing Aerostructure*, In Proceedings of SMASIS 2011 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Scottsdale, Arizona, September 2011, pp. 1–9.
17. D. Friedman, S. Bieniawski, D. Hartl, *Simulation and Control Design for Shape Memory Alloy Torque Tubes*, In Proceedings of SMASIS 2011 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Scottsdale, Arizona, September 2011, pp. 1–11.
18. S. Oehler, D. Hartl, T. Turner, D. Lagoudas, *Modeling Fluid Structure Interaction with Shape Memory Alloy Actuated Morphing Aerostructures* In Proceedings of SPIE Smart Structures and Materials/NDE Conference, San Diego, March 2012, pp. 1–11.
19. D. Hartl, A. Solomou, D. Lagoudas, D. Saravanos, *Phenomenological Modeling of Induced Transformation Anisotropy in Shape Memory Alloy Actuators* In Proceedings of SPIE Smart Structures and Materials/NDE Conference, San Diego, March 2012, pp. 1–14.
20. S. Oehler, D. Hartl, D. Lagoudas, R. Malak, *Design of Morphing SMA Aerostructures by Computational Modeling* In Proceedings of the 23rd International Congress of Theoretical and Applied Mechanics, Beijing, China, August 2012, pp. 1–2.
21. B. Agboola, D. Hartl, D. Lagoudas, *A Study of Actuation Fatigue of Shape Memory Alloy* In Proceedings of SMASIS 2012 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Stone Mountain, Georgia, September 2012, pp. 1–7.
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28. J. Mabe, B. Fisher, D. Hartl, *Response of Trained Torsional Actuators Operating under Reverse Bias Loads* In Proceedings of TMS 2013 142nd Annual Meeting and Exhibition, San Antonio, Texas, March 2013, pp. 1–12.
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34. **E. Peraza-Hernandez, D. Hartl, R. Malak, *Simulation-Based Design of a Self-Folding Smart Material System* In Proceedings of the ASME 2013 International Design Engineering Technical Conference & Computers and Information in Engineering Conference, Portland, Oregon, August 2013.
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36. R. Wheeler, J. Santa-Cruz, D. Hartl, D. Lagoudas, *Effects of Processing and Loading on Equiatomic NiTi Fatigue Life and Localized Failure Mechanisms* In Proceedings of ASME Smart Materials Adaptive Structures and Intelligent Systems (SMASIS) Conference, Snowbird, UT, Sept. 2013, pp. 1–8.
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48. **T. Halbert, P. Moghadas, R. Malak, D. Hartl, *Control of a Shape Memory Alloy Based Self-Folding Sheet* In Proceedings of the ASME 2013 International Design Engineering Technical Conference & Computers and Information in Engineering Conference, Buffalo, New York, August 2014.
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51. R. Saunders, D. Hartl, J. Herrington, L. Hodge, J. Mabe, *Optimization of a Composite Morphing Wing with Shape Memory Alloy Torsional Actuators* In Proceedings of ASME Smart Materials Adaptive Structures and Intelligent Systems (SMASIS) Conference, Newport, RI, Sept. 8–10, 2014.
52. R. Wheeler, J. Santa-Cruz, D. Hartl, Y. Chemisky, D. Lagoudas *Characterization and Modeling of Thermo-Mechanical Fatigue in Equiatomic NiTi Actuators* In Proceedings of ASME Smart Materials Adaptive Structures and Intelligent Systems (SMASIS) Conference, Newport, RI, Sept. 8–10, 2014.
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55. E. Peraza-Hernandez, A. Kotz, D. Hartl, R. Malak, *Design and Optimization of SMA-based Self-Folding Laminates Considering Sparse Insulating Layers* In Proceedings of ASME Smart Materials Adaptive Structures and Intelligent Systems (SMASIS) Conference, Newport, RI, Sept. 8–10, 2014.
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58. C. Bertagne, D. Hartl, T. Cognata, *Analysis of Highly Coupled Thermal-Structural Responses in Morphing Radiative Bodies*, In Proceedings of AIAA SciTech 2015, Kissimmee, FL, January 2015.
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62. C. Bertagne, J. Whitcomb, D. Hartl, *Simulating Coupled Thermal-Mechanical Interactions in Morphing Radiators* In Proceedings of SPIE Smart Structures and Materials/NDE Conference, San Diego, March 2015.

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64. J. Rohmer, E. Peraza Hernandez, D. Hartl, J. Boyd, D. Lagoudas, and R. Skelton, *An Experimental and Numerical Study of Shape Memory Alloy-based Tensegrity/Origami Structures*, In Proceedings of ASME 2015 International Mechanical Engineering Congress & Exposition, Houston, November 2015.
65. **P. Moghadas, R. Malak, D. Hartl, *Reinforcement Learning for Control of a Shape Memory Alloy Based Self-Folding Sheet* In Proceedings of the ASME 2015 International Design Engineering Technical Conference & Computers and Information in Engineering Conference, Boston, August 2015.
66. **W. Scholten, D. Hartl, T. Strganac, T. Turner, *Reduction of Actuation Loads In a Self-Deploying SMA-Based Slat-Cove Filler for a Transport Aircraft* In Proceedings of ASME Smart Materials Adaptive Structures and Intelligent Systems (SMASIS) Conference, Colorado Spring, CO, Sept. 21–23, 2015.
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72. B. Bielefeldt, A. Benzerga, D. Hartl *Analysis of Shape Memory Alloy Sensory Particles for Damage Detection via Substructure and Continuum Damage Modeling* In Proceedings of SPIE Smart Structures and Materials/NDE Conference, Las Vegas, NV, March 2016.
73. D. Hartl, G. Huff, H. Pan, L. Smith, R. Bradford, G. Frank, J. Baur, *Analysis and Characterization of Structurally Embedded Vascular Antennas Using Liquid Metals* In Proceedings of SPIE Smart Structures and Materials/NDE Conference, Las Vegas, NV, March 2016.
74. **L. Smith, H. Pan, R. Bradford, G. Frank, D. Hartl, J. Baur, G. Huff, *A Study of Liquid Metal Alloy Reconfigurable Antennas Embedded in a Structural Composite* In Proceedings of 2016 IEEE International Symposium on Antennas and Propagation/USNC-URSI National Radio Science, Fajardo, Puerto Rico, June/July 2016.
75. D. Hartl, G. Frank, G. Huff, J. Baur, *Analysis-Driven Design of Vascular Antennas Embedded in Multifunctional Composites* In Proceedings of the 31st ASC Technical Conference and ASTM D30 Meeting, Williamsburg, VA, September 2016.

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77. E. Peraza Hernandez, D. Hartl, and D. Lagoudas, *Design of Origami Structures with Smooth Folds*, In Proceedings of ASME SMASIS 2016, Stowe, VT, October 2016.
78. W. Scholten, R. Patterson, J. Volpi, Q. Chapelon, D. Hartl, T. Strganac, and T. Turner *Noise Reduction in a High Lift Wing Using SMAs: Computational Fluid-Structural Analysis*, In Proceedings of ASME SMASIS 2016, Stowe, VT, September 2016.
79. D. Hartl, B. Bielefeldt, G. Reich, and P. Beran, *Multi-fidelity Analysis and Experimental Characterization of Muscular-Skeletal Structures Optimized via Genetic Programming*, In Proceedings of AIAA SciTech 2017, Grapevine, TX, January 2017.
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81. P. Leal, R. Patterson, and D. Hartl, *Thermal-Structural Analysis of a Shape Memory Alloy Based Bio-Inspired Morphing Wing*, In Proceedings of AIAA SciTech 2017, Grapevine, TX, January 2017.
82. W. Scholten, R. Patterson, Q. Chapelon, D. Hartl, T. Strganac, and T. Turner *Computational and Experimental Fluid-Structure Interaction Assessment of a High-Lift Wing with a Slat-Cove Filler for Noise Reduction*, In Proceedings of AIAA SciTech 2017, Grapevine, TX, January 2017.
83. E. Peraza Hernandez, D. Hartl, and D. Lagoudas, *Modeling and Design of Shape Memory Alloy-based Origami Structures with Smooth Folds*, In Proceedings of AIAA SciTech 2017, Grapevine, TX, January 2017.
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85. C. Bertagne, J. Chong, J. Whitcomb, D. Hartl, and L. Erickson *Experimental Characterization of a Composite Morphing Radiator Prototype in a Relevant Thermal Environment*, In Proceedings of AIAA SciTech 2017, Grapevine, TX, January 2017.
86. J. Mingear and D. Hartl, *Corrosion of Nickel-Titanium, C110, and Al6061 in Gallium-based Liquid Metal Alloys*, In Proceedings of 2017 TMS Annual Meeting & Exhibition, San Diego, CA, Feb-Mar 2017.
87. J. Baur, T. Gibson, D. Rapping, S. Murphy, G. Frank, R. Bradford, G. Huff, D. Hartl, D. Phillips, *Integration of Structurally Embedded Vascular Antenna (SEVA) in a Complex Curved Composites*, In Proceedings of the Society for the Advancement of Material and Process Engineering Annual Conference, Seattle, WA, May 2017, (winner of the *Outstanding Technical Paper Award, Third Place*)
88. B. Bielefeldt, J. Mingear, and D. Hartl, *Induction Heating of Shape Memory Alloy Components Using Liquid Metal Energy Circuits for High Bandwidth Distributed Actuation*, Proceedings of the 8th ECCOMAS Thematic Conference on Smart Structures and Materials, Madrid, June 2017.

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90. J. Baur, D. Hartl, G. Frank, G. Huff, Keith. Slinker, C. Kondash, W. Kennedy, G. Ehlert, *Experimental Mechanics for Multifunctional Composites and Next Generation UAVs* Proceedings of the Conference and Exposition on Experimental and Applied Mechanics, Indianapolis, IN, June 2017.
91. **J. Baur, D. Hartl, G. Frank, R. Bradford, D. Phillips, T. Gibson, D. Rapking, G. Huff, *Beamforming and Reconfiguration of a Structurally Embedded Vascular Antenna Array (SEVA2) in a Complex Curved Composite* In Proceedings of 2017 IEEE International Symposium on Antennas and Propagation/USNC-URSI National Radio Science, San Diego, CA, July 2017.
92. **C. Bertagne, M. Wescott, J. Whitcomb, D. Hartl, and L. Erickson , *Overview of Technology Development of Shape Memory Alloy Morphing Radiators* In Proceedings of 2017 International Conference on Environmental Systems (ICES), Charleston, SC, July 2017.
93. J. Baur, D. Hartl, G. Frank, R. Bradford, G. Huff, *Graphical Material Selection Methods for Multi-Constraint, Multi-Functional Composites Pressure Vessels*, In Proceedings of the 2017 AMSE PVP (Pressure Vessels & Piping) Conference, Hawaii, July 2017.
94. **E. Peraza Hernandez, D. Hartl, D. Lagoudas, *Analysis and Design of an Active Self-Folding Antenna* In Proceedings of the ASME 2017 International Design Engineering Technical Conference & Computers and Information in Engineering Conference, Cleveland, OH, August 2017.
95. **D-Y. Hur, E. Peraza Hernandez, E. Galvan, D. Hartl, R. Malak, *Design Optimization of Folding Solar Powered Autonomous Underwater Vehicle Using Origami Architecture* In Proceedings of the ASME 2017 International Design Engineering Technical Conference & Computers and Information in Engineering Conference, Cleveland, OH, August 2017.
96. **G. Scalet, E. Boatti, M. Ferraro, V. Mercuri, D. Hartl, F. Auricchio, *Explicit Finite Element Implementation of a Shape Memory Alloy Constitutive Model and Associated Analyses*, Proceedings of XIV International Conference on Computational Plasticity - COMPLAS 2017, Barcelona, Sept. 2017.
97. P. Leal, T. White, V. Goecks, J. Valasek, D. Hartl, *Experimental and Computational Assessment of a Shape Memory Alloy Based Morphing Wing Incorporating Linear and Non-Linear Control*, In Proceedings of AIAA SciTech 2018, Kissimmee, FL, January 2018.
98. V. Goecks, P. Leal, T. White, J. Valasek, D. Hartl, *Control of Morphing Wing Shapes with Deep Reinforcement Learning*, In Proceedings of AIAA SciTech 2018, Kissimmee, FL, January 2018.
99. P. Leal, H. Stroud, E. Sheahan, M. Cabral, D. Hartl, *Skin-Based Camber Morphing Utilizing Shape Memory Alloy Composite Actuators in a Wind Tunnel Environment*, In Proceedings of AIAA SciTech 2018, Kissimmee, FL, January 2018.
100. Vishala, W. Scholten, R. Fernandes, B. Dunbar, D. Hartl, *Finite Element Analysis of an Index Finger Flexion in an Extravehicular Activity Glove*, In Proceedings of AIAA SciTech 2018, Kissimmee, FL, January 2018.
101. H. Stroud, P. Leal, D. Hartl *Experimental multiphysical characterization of an SMA driven, camber morphing owl wing section* In Proceedings of SPIE Smart Structures and Materials/NDE Conference, Denver, CO, 2018.

102. A. Davis, M. Mirsayar, E. Sheahan, D. Hartl *Structural health monitoring for DOT using magnetic shape memory alloy cables in concrete* In Proceedings of SPIE Smart Structures and Materials/NDE Conference, Denver, CO, 2018.
103. J. Chong, P. Walgren, D. Hartl *Demonstration of a shape memory alloy torque tube-based morphing radiator* In Proceedings of SPIE Smart Structures and Materials/NDE Conference, Denver, CO, 2018.
104. **B. Bielefeldt, D. Hartl, E. Akleman, *L-System-Generated Topology Optimization of Compliant Mechanisms Using Graph-Based Interpretation* In Proceedings of the ASME 2018 International Design Engineering Technical Conference & Computers and Information in Engineering Conference, Quebec City, Quebec, Canada, August 2018.
105. P. Walgren, O. Benafan, L. Erickson, D. Hartl, *Towards High Turndown Ratio Shape Memory Alloy-Driven Morphing Radiators*, In Proceedings of ASME SMASIS 2018, San Antonio, TX, September 2018.
106. W. Scholten, R. Patterson, M. Eustice, S. Cook, D. Hartl, T. Strganac, T. Turner, *Aerodynamic and Structural Evaluation of an SMA Slat-Cove Filler Using Computational and Experimental Tools at Model Scale*, In Proceedings of ASME SMASIS 2018, San Antonio, TX, September 2018.
107. G. Arena, R. Groh, A. Pirrera, W. Scholten, D. Hartl, T. Turner, *A Tailored Nonlinear Slat-Cove Filler for Airframe Noise Reduction*, In Proceedings of ASME SMASIS 2018, San Antonio, TX, September 2018.
108. D. Sessions, J. Ruff, F. Espinal, G. Huff, S. Jape, E. Peraza Hernandez, D. Lagoudas, D. Hartl, B. Borges, *Folding, Tessellation, and Deployment of an Origami-Inspired Active-Material-Enabled Self-Folding Reflector Antenna*, In Proceedings of the 2018 IEEE International Symposium on Antennas and Propagation & USNC/URSI National Radio Science Meeting, Boston, MA, July 2018.
109. P. Walgren, R. Seifert, W. Chapkin, G. Frank, J. Baur, DJ Hartl, *Efficient Design of a Smooth Bending Cylinder via Parametric Studies and Optimization*, In Proceedings of AIAA SciTech 2019, San Diego, CA, January 2019.
110. JH Mabe, DJ Hartl, N Tichenor, M Zackery, E Blades, M Nucci, *Fluid-Structure Interaction Modeling of a Shape-Memory Alloy Actuated Supersonic Wind Tunnel Model Alloy*, In Proceedings of AIAA SciTech 2019, San Diego, CA, January 2019.
111. PB Leal, T Giblette, DF Hunsaker, DJ Hartl *Extended 3D Class/Shape Transformation equations for multicomponent aircraft assemblies*, In Proceedings of AIAA SciTech 2019, San Diego, CA, January 2019.

** peer-reviewed conference paper

II.5. Media Coverage of Research

- *Folding Frontier: Origami Engineering Could Be the Next Big Thing in Manufacturing*, PRiSM (ASEE Magazine; cover story), Jan. 2013.
- *Academic Case Study: Using Abaqus to Simulate Self-folding Structures*, Simulia Community News, May 2015, pp. 13–14.
- *Better flight through shape-shifting materials*, Aerospace America, December 2015, pp. 6–7.

II.6. Funded Research Projects

Principle Investigator / Co-PI

1. “Modeling of SMA Actuated Trailing Edge Devices,” Boeing Company, PI: Lagoudas, Co-PI: Hartl, 10/1/09 – 9/30/2010, \$134,721, Hartl:\$134,721.
2. “Analysis of Shape Memory Alloy (SMA) Test Data and Characterization of SMA Test Specimens, Boeing Company, ” PI: Lagoudas, Co-PI: Hartl, Students: 1, 3/11/10 – 6/30/2010, \$35,000, Hartl:\$5,000.
3. “Large Tube and High Torque Test Bed (HTTB) Modeling Using ABAQUS and UMATs,” Boeing Company, PI: Lagoudas, Co-PI: Hartl, 3/26/10 – 9/30/10, \$38,650, Hartl:\$38,650.
4. “Texas A&M University eMAR Active Spar FEA Analysis,” Boeing Company, PI: Lagoudas, Co-PI: Hartl, 10/1/10 – 12/31/10, , \$19,477, Hartl: \$19,477.
5. “Improved SMA Actuators,” Boeing Company, PI: Lagoudas, Co-PI: Hartl, Students: 1, 2/7/11 – 10/30/11, , \$70,500, Hartl: \$70,500.
6. “Conformal Moldline Link (CML) Modeling Using ABAQUS,” Boeing Company, PI: Hartl, Co-PI: Lagoudas, Students: 1, 3/15/11 – 12/31/11, \$95,655, Hartl: \$95,655.
7. “Active Spar Finite Element Analysis Support,” Boeing Company, PI: Lagoudas, Co-PI: Hartl, 5/1/11 – 10/16/11, \$46,500, Hartl: \$46,500.
8. “Educational Institution Contract with Texas A&M University,” Sandia National Laboratories, PI: Lagoudas, Co-PIs: Boyd, Hartl, Karaman, Students: 2, 9/2/11 – 8/31/12, \$25,000, Hartl: \$5,000.
9. “Conformal Moldline Link (CML) Modeling Using ABAQUS (Follow-On),” Boeing Company, PI: Hartl, Students: 1, 2/15/12 – 8/14/12, \$51,693, Hartl: \$51,693.
10. “Improved SMA Modeling and Control Methods and Tools,” Boeing Company, PI: Hartl, Students: 1, 2/15/12 – 6/15/12, \$29,404, Hartl: \$29,404.
11. “Implementation of SMAs into Aircraft Seating - Phase 1: Headrest,” Weber Aircraft LLC, PI: Hartl, Co-PI: Lagoudas, Students: 1, 5/1/12 – 6/30/12, \$27,047, Hartl: \$27,047.
12. “Shape Memory Alloy Fatigue,” Boeing Company, PI: Lagoudas, Co-PI: Hartl, Students: 1, 6/22/12 – 12/14/12, \$50,000, Hartl: \$5,000.
13. “Automated Morphing Wall Installation,” TAMU Academy for the Visual and Performing Arts, PI: Esquivel, Co-PI: Hartl, 1/15/13 – 1/15/14, \$7,271, Hartl: \$3,500.
14. “Engineering Services for the Smart High-turndown Area Articulator with Passive Environment Response,” Jacobs Technology Inc. / NASA-JSC, PI: Hartl, 06/01/13 – 06/30/13, \$11,500, Hartl:\$11,500.
15. “Improved SMA Modeling Methods and Tools,” Boeing Company, PI: Hartl, 12/10/13 – 12/10/14, \$30,900, Hartl: \$30,900.
16. “Development of Analysis Tools for Induction Heating of SMAs,” Boeing Company, PI: Hartl, Co-PI: Boyd, Students: 1, 02/01/14 – 05/31/14, \$31,400, Hartl: \$16,000.
17. “Coupling Damage-Sensing Particles and Computational Micromechanics to Enable the Digital Twin: Phase II,” NASA, PI: Hochhalter, Co-PIs: Newman, Leser, Glassgen, Ratcliffe, Gupta, Heber, Hartl, Karaman, Students: 2, 4/1/2104–9/30/15, \$300,000, Hartl: \$50,000.

18. “Tensile and Torque Tube Fatigue Characterization of NiTiHf High Temperature Shape Memory Alloys,” PI: Karaman, Co-PI: Hartl, Lagoudas, Students: 2, 6/1/14 – 12/31/14, \$65,000, Hartl: \$21,000.
19. “AFE 77 - Shape Memory Alloy Test Methods”, Various Sponsors (via Aerospace Vehicle Systems Institute) PI: Hartl, Students: 1, 06/01/2014–10/31/2015, \$26,918, Hartl: \$26,918.
20. “Improved SMA Modeling Methods and Tools (Add-On),” Boeing Company, PI: Hartl, 6/1/13 – 8/31/14, \$20,000, Hartl: \$20,000.
21. “Variable Geometry Radiators Using Shape Memory Alloys”, NASA PI: Hartl, Students: 1, 08/01/2014–07/31/2016, \$130,000, Hartl: \$130,000.
22. “Computational Analysis and Design of an SMA-Based Broadhead Blade,” Slick Hunting Products, PI: Hartl, Students: 1, 10/15/2014–12/15/2014, \$5,500, Hartl: \$5,500.
23. “Analysis and Optimal Design of SMA-Enabled Reconfigurable Structures for Airframe Noise Control,” NASA (via National Institute of Aerospace), PI: Hartl, Students: 1, 11/15/2014–12/31/2016, \$114,000, Hartl: \$114,000.
24. “Multi-Functional, Multi-Scale Design for Reconfigurable Flight Structures”, AFRL/RQVC (via UTC, Inc.) PI: Hartl, Students: 0, 12/15/2014–04/30/2015, \$35,000, Hartl: \$35,000.
25. “Avian-Inspired Multifunctional Morphing Vehicles”, AFOSR (via UMichigan) PI: Hartl, Students: 2, 06/01/2015–06/30/2018, \$600,000, Hartl: \$600,000.
26. “Exploration of Design Methods for Bio-Inspired Compliant Load-Bearing Mechanisms Based on Evolutionary Algorithms”, AFRL/RQVC (via UTC, Inc.) PI: Hartl, Students: 0, 06/15/2015–10/30/2015, \$18,991, Hartl: \$18,991.
27. “Exploration of Design Methods for Bio-Inspired Compliant Load-Bearing Mechanisms Based on Evolutionary Algorithms”, AFRL/RQVC (via UDRI) PI: Hartl, Students: 0, 12/01/2015–03/30/2017, \$72,000, Hartl: \$72,000.
28. “Shape-Morphing Adaptive Radiator Technology”, NASA-JSC PI: Hartl, Co-PI: Whitcomb, Students: 2, 01/01/2016–12/31/2016, \$76,700, Hartl: \$76,700.
29. “Superelastic SMAs,” NASA (via National Institute of Aerospace), PI: Hartl, Co-PI: Strganac, Students: 1, 09/01/2016–09/25/2017, \$98,607, Hartl: \$98,607.
30. “Materials and Processing of Composite and Hybrids for Additive Research and Multifunctional Structures,” AFRL/RXCC (via Universal Technology Cooperation), PI: Huff, Co-PI: Hartl, Students: 1, 09/01/2015–02/28/2017, \$117,646, Hartl: \$2,447.
31. “Exploration of Design Methods for Bio-Inspired Compliant Load-Bearing Mechanisms Based on Evolutionary Algorithms”, AFRL/RQVC (via UDRI) PI: Hartl, Students: 1, 04/01/2017–08/31/2017, \$50,000, Hartl: \$50,000.
32. “Synergistic Modeling, Characterization, and Design of Embedded Phase Transforming Sensory Particles,” NSF, PI: Hartl, Co-PI: Karaman, Students: 1, 04/01/17–03/31/20, \$390,536, Hartl: \$208,338.
33. “Transportation Consortium of South-Central States (Tran-SET)”, Dept. of Transportation, PI: Karaman, Co-PIs: Hartl, Radovic, Karsilayan, Grasley, Students: 1, 11/30/2016–11/30/2018, \$279,000, Hartl: \$31,025.
34. “Shape-Morphing Adaptive Radiator Technology”, NASA-JSC, PI: Hartl, Co-PI: Whitcomb, Students: 2, 01/01/2017–10/30/2017, \$61,500, Hartl: \$61,500.
35. “University Leadership Initiative”, NASA, PI: Lagoudas, co-PIs: Hartl, Bowersox, Cizmas, Students: 2, 06/15/2017–06/14/2022 \$9,972,212 Hartl: \$428,220.

36. “Siemens Electric Propulsion Aircraft,” Siemens, PI: Hartl, Students: 0, 09/01/2017–08/31/2018, \$110,000, Hartl: \$110,000.
37. “EFRI-OSISSEI: Synthesizing Complex Structures from Programmable Self-Folding Active Materials (Supplement),” NSF, PI: McAdams, Co-PIs: Lagoudas, Amato, Akleman, Hartl \$399,683, 8/1/17 – 7/31/19, Hartl: \$199,841.
38. “Superelastic SMAs,” NASA (via National Institute of Aerospace), PI: Hartl, Co-PI: Strganac, Students: 1, 09/26/2017–09/30/2018, \$48,650, Hartl: \$48,650.
39. “Add-on For: Adaptive and Reconfigurable System Design Explorations (ARSDE)”, AFRL/RQVC (via UDRI) PI: Hartl, Students: 1, 12/31/2017-12/12/2018, \$61,290, Hartl: \$61,290.
40. “Substructure Modeling of Missile Enhancement via Reconfigurable Interceptor Nose (SMERLIN)”, AFRL/RX (via UTC) PI: Hartl, Students: 1, 01/01/2018-12/31/2020, \$252,340, Hartl: \$252,340.
41. “Modeling and Simulation of Variable Thickness Devices and Structures Using Shape Memory Alloys”, The Boeing Company, PI: Hartl, Students: 1, 07/09/2018-11/16/2018, \$18,400, Hartl: \$18,400.
42. “Experimental and Computational Research on the Fluid-Structure-Interaction Behavior of Structural Noise Treatments for Aircraft High-Lift Systems,” NASA (via National Institute of Aerospace), PI: Hartl, Co-PI: Strganac, Students: 2, 01/01/2019–12/31/2019, \$130,020, Hartl: \$130,020.
43. “Biomimetic Adaptive Aircraft Structures (BAAT),” Army Research Labs (via The Boeing Company), PI: Hartl, Students: 1, 12/03/2018–03/31/2021, \$206,638, Hartl: \$206,638.
44. “Cyber Training : CIC: The Texas A&M University Computational Materials Science Summer School (CMS3),” NSF, PI: Benzerga, co-PIs: Lagoudas, Amato, Akleman, McAdams, Hartl, Students: 0, 09/01/18–08/31/21, \$499,822, Hartl: \$71,403.
45. “Educatar: Supplementing The Stem Classroom Experience,” Texas A&M University, PI: Hartl, co-PIs: Arroyave, Nowotarski, Students: 1, 1/1/2019–12/31/2019, \$36,000, Hartl: \$30,000.

Senior Personnel

- “EFRI-OSISSEI: Synthesizing Complex Structures from Programmable Self-Folding Active Materials,” NSF, PI: Malak, Co-PIs: Lagoudas, Amato, Akleman, McAdams \$1,998,423, 8/1/12 – 7/31/16 (Member of core proposal team; manage AERO component), Hartl: \$196,325.

II.7. New Design Methods, Patents

1. “Shape Memory Alloy Rods for Actuation of a Continuous Moldline Link Technology,” C. Madsen (Boeing) and D. Hartl, Disclosure of Invention filed Jan. 2013.
2. “A Device for Variable Heat Rejection in a Vacuum Through the Passive Actuation of Radiator Panels in Response to Temperature,” T. Cognata (Paragon SDC), C. Dinsmore (NASA), and D. Hartl, Disclosure of Invention filed Jul. 2013.
3. “Variable Heat Rejection Device,” T. Cognata (Paragon SDC), C. Dinsmore (NASA), R. Sheth (NASA), and D. Hartl, Patent application 14960301 filed Dec. 2015.
4. “A flexible thermally conductive composite laminate panel for a radiative variable heat rejection device that uses the temperature dependent behavior of shape memory alloys to

passively open/close the panel in response to the panels temperature,” C. Bertagne, J. McQuien, M. Wescott, D. Hartl, J. Whitcomb, Disclosure of Invention filed Oct. 2016.

5. “A Physically Reconfigurable Structurally Embedded Vascular Antenna (SEVA),” J. Baur, G. Huff, D. Hartl, Disclosure of Invention filed Feb. 2017. “Physically Reconfigurable Structurally Embedded Vascular Antenna,” Provisional Patent filed Mar. 2017.

III. Service

III.1. Membership in Professional Societies

American Institute of Aeronautics and Astronautics (AIAA) (1999)
International Society for Optics and Photonics (SPIE) (2007)
American Society of Mechanical Engineers (ASME) (2011)
The Minerals, Metals, and Materials Society (TMS) (2011)

III.2. Professional Societies Service and Leadership

Service

- Active Member, ASME Aerospace Division, Adaptive Structures & Material Systems Branch, Sept. 2011 – present
- Active Member, ASME Branch on Adaptive Structures & Material Systems, Active and Multifunctional Materials Technical Committee, Sept. 2012 – present
- Active Member, AIAA Adaptive Structures Technical Committee, Jan. 2015 – present

Leadership

- Secretary, ASME Branch on Adaptive Structures & Material Systems, Active and Multifunctional Materials Technical Committee, Sept. 2012 – present
- Symposium 2 Co-Chair, ASME Branch on Adaptive Structures & Material Systems, Active and Multifunctional Materials Technical Committee, Mar. 2014 – present
- Secretary, ASME Aerospace Division, Adaptive Structures & Material Systems Branch, Sept. 2015 – Sept. 2016
- Treasurer, ASME Aerospace Division, Adaptive Structures & Material Systems Branch, Sept. 2016 – Sept. 2017
- Chair, Publication Sub-Committee, AIAA Adaptive Structures Technical Committee, Jan. 2017 – present
- co-Char, ASME Aerospace Division, Adaptive Structures & Material Systems Branch, Sept. 2017 – Sept. 2018
- co-Chair, AIAA Adaptive Structures Technical Committee, Jan. 2018 – present
- Chair, ASME Aerospace Division, Adaptive Structures & Material Systems Branch, Sept. 2018 – present

III.3. Conference/Symposium/Workshop Organization

Conference Organizing Leadership

- Co-Chair: Student Paper Competition, SPIE Smart Structures/NDE Conference, Sept. 2013–present.

- Co-Chair: ASME, Smart Materials Adaptive Structures and Intelligent Systems Conference, Mechanics and Behavior of Active Materials Symposium, Mar. 2014–present.

Conference Organizing Committee

- The 21st International Conference on Composite Materials (ICCM-21), Track Leader, Track 5.3: Stimuli Responsiveness and Shape Reconfiguration, Aug. 20-25 2017, Xi'an, China.
- SMI-FASE 2016 (Shape Modeling International'2016 - Fabrication and Sculpting Event), Jun. 20-24, 2013, Berlin.
- Gordon Research Conference on “Multifunctional Materials and Structures”, Social Committee, Jan 31–Feb 5, 2016, Ventura, CA.
- International Conferences on Modern Materials and Technologies, International Advisory Board, “Biomimetic Morphing of Unmanned Aerial Vehicles,” June 5-10, 2016, Perugia, Italy.
- Shape Modeling International (SMI/ISAMA: Shape Fabrication & Sculpting), Jul. 24-26, 2015, Telecom-Lille, France.
- SPIE Smart Structures/NDE Conference, Behavior and Mechanics of Multifunctional Materials and Composites IX (Conference 9432), Mar. 8–12, 2015, San Diego, CA.
- ASME, Smart Materials Adaptive Structures and Intelligent Systems Conference, Mechanics and Behavior of Active Materials Symposium, Sept. 16-18, 2013, Salt Lake City, UT.
- Shape Modeling International (SMI/ISAMA: Shape Fabrication & Sculpting), Jul. 10-12, 2013, Poole, UK.

Workshop Organizer

- Texas A&M SMA Research Summer Workshop, Aug. 4, 2011, College Station, TX.

III.4. Journal Service and Organization

Journal Associate Editor

- Journal of Intelligent Material Systems and Structures

Journal Reviewer

AIAA Journal, ASME Journal of Mechanical Design, European Journal of Mechanics, International Journal of Plasticity, International Journal of Precision Engineering and Manufacturing, International Journal of Solids and Structures, Journal of Applied Mechanics, Journal of Intelligent Material Systems and Structures, Journal of Mechanical Science and Technology, Smart Materials and Structures, and many others.

Special Issue Organization

- Co-Editor, Smart Materials Structures special issue on *Active Materials and Structures for Origami Engineering*, September 2014.
- Co-Editor, Smart Materials Structures special issue on *Adaptive and active materials: selected papers from the ASME 2014 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (Newport, RI, USA, 8–10 September 2014)*, September 2015.
- Co-Editor, Smart Materials Structures special issue on *Adaptive and active materials: selected papers from the ASME 2018 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (San Antonio, TX, USA, September 2018)*.

IV. Professional Outreach

IV.1. Seminars and Presentations

Invited Talks and Seminars

1. ***Constitutive Modeling and FEA Analysis of Shape Memory Alloy Materials and Applications*, Department of Mechanical Engineering and Aeronautics Seminar, The University of Patras, Patras, Greece, September 2009.
2. *Recent Advances in the Analysis, Design and Optimization of SMA-Based Aerostructures*, Aerospace Engineering Seminar Series, Texas A&M University, College Station, Texas, January 2011.
3. *Optimized Design of SMA-Based Active Structures*, Winter Meeting of the OSU/TAMU Smart Vehicle Concepts Center, College Station, Texas, February 2011.
4. ***Recent Advances in the Analysis, Design and Optimization of SMA-Based Aerostructures*, COBEM 2011: 21st International Congress of Mechanical Engineering, Natal, Brazil, October 2011.
5. *Advanced Multi-physical Analysis and Optimization of SMA-Based Morphing Structures*, Workshop on “New Concepts for Active Materials, Actuators, and Bioinspired Sensing-Actuation Control” University of Washington, Seattle, Washington, April 2012.
6. ***Advanced Multi-physical Analysis and Optimization of SMA-Based Morphing Structures*, Institute of Mechanics Seminar, Technical University Dortmund, Dortmund, Germany, June 2012.
7. ***Advanced Multi-physical Analysis and Optimization of SMA-Based Morphing Structures*, Department of Mechatronics Seminar, University of Saarland, Saarland, Germany, June 2012.
8. ***Advanced Multi-physical Analysis and Optimization of SMA-Based Morphing Structures*, Seminar of Laboratoire d’étude des Microstructures et de Mécanique des Matériaux (LEM³), Arts et Métiers ParisTech, Metz, France, July 2012.
9. ***Advanced Multi-physical Analysis and Optimization of SMA-Based Morphing Structures*, Advanced Composites Centre for Innovation and Science, Bristol University, Bristol, UK, July 2012.
10. ***Numerical Analysis and Design of Novel SMA-Based Systems*, Seminar of Laboratoire d’étude des Microstructures et de Mécanique des Matériaux (LEM³), Arts et Métiers ParisTech, Metz, France, May 2013.
11. *SYMP 2: Modeling, Design Optimization, and Experimental Assessment of SMA-Based Reconfigurable Structures*, ASME Smart Materials Adaptive Structures and Intelligent Systems (SMASIS) Conference, Snowbird, UT, Sept. 2013.
12. *Modeling, Design Optimization, and Experimental Assessment of SMA-Based Reconfigurable Structures* Aerospace Engineering Seminar Series, Texas A&M University, College Station, Texas, August 2013.
13. *Materials Development and Analysis-Driven Design for Multifunctional Material Applications* NASA Langley Research Center, Hampton, VA, September 2013.
14. *Modeling, Design Optimization, and Experimental Assessment of SMA-Based Reconfigurable Structures* Boeing Research and Technology “SMA Research Summit”, The Boeing Company, Seattle, Washington, January 2014.

15. *Modeling and Analysis of Recoverable and Irrecoverable Inelastic Phenomena in Phase Transforming Structural Materials Across Scales* Aerospace Engineering Seminar Series, Texas A&M University, College Station, Texas, February 2014.
16. *Modeling and Analysis of Recoverable and Irrecoverable Inelastic Phenomena in Shape Memory Alloys Across Scales* Mechanical Engineering Seminar, Virginia Tech, Blacksburg, Virginia, March 2014.
17. *Modeling, Optimization, and Characterization of SMA-Based Reconfigurable Structures* Army Research Lab, Adelphi Laboratory Center, Adelphi, Maryland, April 2014.
18. *Modeling, Optimization, and Characterization of SMA-Based Reconfigurable Structures* US Naval Research Lab, Multifunctional Materials Branch, Washington, D.C., April 2014.
19. *Analysis and Design of Functionally Optimized SMA-Based Reconfigurable Structures* Air Force Research Lab, Structural Materials Division, Materials and Manufacturing Directorate, Dayton, OH, May 2014.
20. ***Methods for Analysis and Optimization of SMA-Based Structures Across Scales*, 3rd Annual Symposium on Smart and Multi-functional Materials, Center for Smart Materials and Structures, Harbin Institute of Technology, Harbin, China, June 2014.
21. *Analysis and Design of Functionally Optimized SMA-Based Reconfigurable Structures*, Dept. of Mechanical Engineering William Maxwell Reed Seminar Series, University of Kentucky, Lexington, KY, October 2015.
22. *Multiphysical Modeling and Design of Multifunctional Aerostructures Across Scales*, Dept. of Aerospace Engineering Seminar Series, University of Michigan, Ann Arbor, MI, January 2016.
23. *Additive Topological Optimization of Muscular-Skeletal (Micro?) Structures via Genetic Programming*, Air Force Research Lab, Structural Materials Division, Materials and Manufacturing Directorate, Dayton, OH, March 2016.
24. *Multifunctional Composites and Genetic Programming for Adaptive Structures Design: An Air Force Research Laboratory Experience* Aerospace Engineering Seminar Series, Texas A&M University, College Station, Texas, April 2016.
25. *Metals that Move and Aircraft that Morph* Science Cafe Bryan/College Station (sponsored by WGBH Educational Foundation), Bryan, TX, April 2017.
26. *Liquid Metals, Genetic Programming and Morphing Wings: From Academia to AFRL and Back Again* Mechanical Engineering Seminar, Purdue University, West Lafayette, Indiana, May 2017.
27. *Energetic Transduction in Novel Solid-Liquid Metal Composite Actuators*, Air Force Research Lab, Structural Materials Division, Materials and Manufacturing Directorate, Dayton, OH, August 2017.
28. ***Computational Fluid-Structure Interaction Assessment of a High-Lift Wing with a Slat-Cove Filler for Noise Reduction*, Software Cradle User's Conference 2017, Tokyo, Japan, October 2017.
29. *Analysis of Fluid-Structure Interactions in a High-Lift Wing with a Slat-Cove Filler for Noise Reduction*, NASA-Langley Research Center Aeroacoustics Branch Seminar, Hampton, VA, November 2017.

30. *Investigation, Analysis, and Design of Multifunctional Materials and Aerospace Structures*, Air Force Research Lab, Structural Materials Division, Materials and Manufacturing Directorate, Dayton, OH, August 2018.
31. *Aerodynamic Advantages of utilizing Camber Morphing Wings for Lightweight Aircraft*, ASME Smart Materials Adaptive Structures and Intelligent Systems (SMASIS) Conference, San Antonio, TX, September 2018.
32. ***Biomimetic Exploration and Design of Shape Memory Materials and Adaptive Structures [Keynote]*, XVIII International Symposium on Dynamic Problems of Mechanics (DINAME 2019), Buzios, Brazil, March 2019.
33. *Shape Memory Materials and Adaptive Structures: Explorations, Analyses, and Designs*, Ford Motor Company, Dearborn, MI, April 2019.

** International

Panels

1. *SYMP I: Origami IV – Panel*, ASME Smart Materials Adaptive Structures and Intelligent Systems (SMASIS) Conference, Snowbird, UT, Sept. 2013.