

CURRICULUM VITAE

ANDREW J. GROSS

Assistant Professor
Mechanical Engineering
University of South Carolina

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EDUCATION

- Harvard University** September 2015 - July 2019
Postdoctoral Fellow in the School of Engineering and Applied Sciences
Faculty Advisor: Katia Bertoldi
Project: Nano-architected materials
- The University of Texas at Austin** August 2010 - August 2015
Ph.D. in Aerospace Engineering
Advisor: K. Ravi-Chandar
Thesis: Towards the predictive modeling of ductile failure
- Iowa State University** August 2006 - May 2010
B.S. in Aerospace Engineering

RESEARCH INTERESTS

With a background in solid mechanics, interests are centered on the mechanical properties of materials. Specific topics of interest include:

- Design, fabrication, and characterization of architected materials; especially those with nanoscale constituents
- The use of full field experimental data for the calibration of material models
- Plasticity and fracture behaviors of materials

PUBLICATIONS

Published journal articles

1. Gross, A. J., & Bertoldi, K. (2019). Additive manufacturing of nanostructures that are delicate, complex, and smaller than ever. *Small*, 1902370.
2. Shanian, A., Jette, F.-X., Salehii, M., Pham, M. Q., Schaenzer, M., Bourgeois, G., ... others (2019). Application of multifunctional mechanical metamaterials. *Advanced Engineering Materials*, 1900084.
3. Vasios, N., Gross, A. J., Soifer, S., Overvelde, J. T., & Bertoldi, K. (2019). Harnessing viscous flow to simplify the actuation of fluidic soft robots. *Soft robotics*.
4. Gross, A., Pantidis, P., Bertoldi, K., & Gerasimidis, S. (2019). Correlation between topology and elastic properties of imperfect truss-lattice materials. *Journal of the Mechanics and Physics of Solids*, 124, 577–598.
5. Gross, A., & Ravi-Chandar, K. (2017). On the deformation and failure of Al 6061-T6 in plane strain tension evaluated through in situ microscopy. *International Journal of Fracture*, 1–26.
6. Gross, A., & Ravi-Chandar, K. (2016). On the deformation and failure of Al 6061-T6 at low triaxiality evaluated through in situ microscopy. *International Journal of Fracture*, 200(1-2), 185–208.

7. Boyce, B., ..., Gross, A., et al. (2016). The second sandia fracture challenge: predictions of ductile failure under quasi-static and moderate-rate dynamic loading. *International Journal of Fracture*, 198(1-2), 5–100.
8. Gross, A., & Ravi-Chandar, K. (2016). Prediction of ductile failure in Ti–6Al–4V using a local strain-to-failure criterion. *International Journal of Fracture*, 198(1-2), 221–245.
9. Gross, A., & Ravi-Chandar, K. (2015). On the extraction of elastic–plastic constitutive properties from three-dimensional deformation measurements. *Journal of Applied Mechanics*, 82(7), 071013.
10. Boyce, B. L., ..., Gross, A., et al. (2014). The sandia fracture challenge: blind round robin predictions of ductile tearing. *International Journal of Fracture*, 186(1-2), 5–68.
11. Gross, A., & Ravi-Chandar, K. (2014). Prediction of ductile failure using a local strain-to-failure criterion. *International Journal of Fracture*, 186(1-2), 69–91.

TEACHING EXPERIENCE

Assistant Instructor - The University of Texas at Austin

- Developed and taught a course on mechanics of materials with approximately 100 students
- Managed a team of teaching assistants

Teaching Assistant - The University of Texas at Austin

- Managed laboratory setup and led laboratory sessions for a course on measurements (4 semesters)
- Led laboratory sessions for a course on material property testing (1 semester)
- Conducted recitation sessions for a mechanics of materials course (3 semesters)

SELECTED PRESENTATIONS

1. Gross, A. Lessons from a comprehensive characterization of common truss-lattice materials, *Society of Engineering Science*, St. Louis, MO, Oct. 15, 2019.
2. Gross, A. and Bertoldi, K. Ultralight, Highly Compressible Nanoscale Lattice-Truss Materials, *European Solid Mechanics Conference*, Bologna, Italy, July 2, 2018.
3. Gross, A. and Bertoldi, K. Ultralight, Highly Compressible Nanoscale Lattice-Truss Materials, *ASME International Mechanical Engineering Congress and Exposition*, Tampa, FL, Nov. 8 2017.
4. Gross, A. and Bertoldi, K. Fabrication and Mechanical Properties of Slender Nanoscale Lattice-Truss Materials, *Society of Engineering Science*, Boston, MA, July 27, 2017.
5. Gross, A. and Bertoldi, K. Design, fabrication, and testing of low-density, high-strength, defect resistant materials, *ASME International Mechanical Engineering Congress and Exposition*, Phoenix, AZ, Nov. 17 2016.
6. Gross, A., and K. Bertoldi, Design fabrication, and testing of low-density, high strength materials, *Society of Engineering Science*, Hyattsville, MD, Oct. 3, 2016.
7. Gross, A., and Ravi-Chandar, K. Confronting the ambiguity of inverse methodologies: the role of the objective function, *Society for Experimental Mechanics*, Costa Mesa, CA, June 9, 2015.
8. Gross, A. and Ravi-Chandar, K. On the extraction of elastic-plastic constitutive properties from three-dimensional deformation measurements, *AmeriMech Symposium*, Austin, TX, Dec. 12, 2014.
9. Gross, A. and Ravi-Chandar, K. Coupling full field deformation measurements and FEM for material characterization, *Society for Experimental Mechanics*, Greenville, SC, June 4, 2014.
10. Gross, A. and Ravi-Chandar, K. Extraction of material properties from 3-D deformation measurements, *ASME International Mechanical Engineering Congress and Exposition*, San Diego, CA, Nov. 18, 2013.

INVITED TALKS

1. Nano-Architected Materials: Truss-Lattice Systems, Stony Brook University, April 15, 2019
2. Nano-Architected Materials: Truss-Lattice Systems, University of South Carolina, March 28, 2019
3. Nano-Architected Materials: Truss-Lattice Systems, Virginia Tech, March 19, 2019
4. Nano-Architected Materials: Truss-Lattice Systems, University of Texas at Dallas, Feb. 20, 2019
5. Design, Fabrication, and Testing of Nano-Architected Truss-Lattice Materials, University of Massachusetts Amherst, Oct. 26, 2018
6. Nano-Architected Materials – Investigation of Truss-Lattice Systems, Missouri University of Science and Technology, March 2, 2018

PEER REVIEWER AFFILIATIONS

Proceedings of the National Academy of Sciences
Journal of the Mechanics and Physics of Solids
International Journal of Solids and Structures
Extreme Mechanics Letters
Applied Physics A
International Journal of Fracture
Mechanics Based Design of Structures and Machines

AWARDS AND HONORS

Max L. Williams Fellowship (2013)
Eugene A. Ripperger Fellowship (2012)
University of Texas Professional Development Award (2012, 2014)
Center for Mechanics of Structures, Solids, and Materials Travel Grant (2013)