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William LePage

Education

2013–present Ph.D., Mechanical Engineering, University of Michigan (expected May 2018)
2013–2015 M.S.E., Mechanical Engineering, University of Michigan
2009–2013 B.S., Mechanical Engineering, Spanish minor, *summa cum laude*, University of Tulsa

Research Experience

University of Michigan

2013–present Research Assistant, *Advanced Materials and Mechanics Laboratory*
Dissertation: Fatigue and fracture mechanics of shape memory alloys.
Advised by Prof. Samantha Daly and Prof. John Shaw

Sandia National Laboratories

2012 & 2013 Summer Research Intern, *Thermal Spray Research Laboratory*
Designed and fabricated electrical and mechanical devices for thermal spray experiments. Designed a dual cold spray robot interface and pressure control system.
Advised by Dr. Aaron Hall

The University of Tulsa

2009–2013 Undergrad Researcher, *Sustainable Engineering for Needy and Emerging Areas*
Designed, tested, and deployed a solar-powered chlorine generator for water purification. Engaged in two summers and three semesters of research sponsored by the Tulsa Undergraduate Research Challenge.
Advised by Prof. John Henshaw and Prof. Gordon Purser

Awards and Fellowships

2017 Nominee for Dept. of Mechanical Engineering, Richard and Eleanor Towner Prize for Outstanding Ph.D. Research (one of two nominees from ME Department)
2017 Best poster presentation, Materials Research Symposium, University of Michigan (selected among 44 graduate student poster presenters)
2017 First prize, Young Stress Analyst Competition, British Society for Strain Measurement (selected from 16 international participants after written and oral presentation competition rounds)
2014 Fellow, National Defense Science and Engineering Graduate (NDSEG) Program
2014 Honorable mention, NSF Graduate Research Fellowship Program
2013 Fellow, Tau Beta Pi Anderson Fellowship
2012 Finalist, Rhodes Scholarship, District VIII
2012 Goldwater Scholar
2011 & 2012 Udall Scholar
2009 National Merit Scholar & University of Tulsa Presidential Scholar (full scholarship)

Publications

Peer-reviewed journal papers

1. **LePage W**, Ahadi A, Lenthe W, Sun QP, Pollock T, Shaw J, Daly S. Fatigue crack growth in nanocrystalline NiTi SMA. *Journal of Materials Research* (invited feature paper), accepted, 2017. https://goo.gl/PR86nA.
2. **LePage W**, Shaw J, Daly S. Optimized paint sequence for speckle patterns in digital image correlation. *Experimental Techniques*, 2017. doi:10.1007/s40799-017-0192-3.
3. Chen K, Wood K, Kazyak E, **LePage W**, Davis A, Sanchez A, Dasgupta N. Dead lithium: mass transport effects on voltage, capacity, and failure of lithium metal anodes. *Journal of Materials Chemistry A*, 2017. doi:10.1039/c7ta00371d.
4. **LePage W**, Daly S, Shaw J. Cross polarization for improved digital image correlation. *Experimental Mechanics*, 2016. doi:10.1007/s11340-016-0129-2.
5. Athuada T, **LePage W**, Chalker J, Ozer R. High density growth of ZnO nanorods on cotton fabric enables access to a flame resistant composite. *RSC Advances*, 2014. doi:10.1039/C4RA01543F.

Other publications

1. **LePage, W.** www.DigitalImageCorrelation.org: a practical guide to DIC. Website published in 2017 and actively maintained as an outreach and service for the experimental mechanics community. http://digitalimagecorrelation.org/.
2. Sarobol P, Hall A, Miller S, Knight M, **LePage W**, Sobczak C, Wesolowski D. Feasibility of preparing patterned molybdenum coatings on bismuth telluride thermoelectric modules. *Sandia National Laboratories*, 2013. SAND2013-7962.
3. **LePage W**, Hampton K, Johnson B, Mayer K, Henshaw J, Purser G. Design and Development of a Portable Off-Grid Water Chlorination System. *International Mechanical Engineering Congress*, 2011. doi:10.1115/IMECE2011-63838.

Teaching and mentoring

2015–present Guest lecturer

- Undergraduate solid mechanics (ME 211, Fall 2015 for Prof. Ellen Arruda)
- Undergraduate mechanics of materials (ME 382, Winter 2016 for Prof. Jeff Sakamoto; Fall 2016 and Spring 2017 for Dr. Kathy Sevener)
- Undergraduate advanced energy solutions (ME 433, Winter 2017 for Prof. Neil Dasgupta, and Spring 2017 for Prof. Claus Borgnakke)
- Graduate plasticity (ME 517, Fall 2015 for Prof. Samantha Daly)

2017–present Instructor for a study group course titled, “Renewable energy: the science, state of the art, and future of renewables.” Created course materials and facilitated six 90-minute sessions with about twenty senior citizens, through the Osher Lifelong Learning Institute (OLLI) at the University of Michigan. Since the course in fall 2017 had enough interest and a wait list, OLLI requested that I do an encore of the course in winter 2018, so I will be repeating the course with new and improved material.

2015–present Mentor for undergraduate researchers

- Advised Yuxin Chen (University of Michigan, B.S.M.E. and B.S.E.E., 2017) in researching the role of the combined electrochemical and mechanical properties of lithium metal anodes for next-generation battery technologies.
- Advised Avery Samuel (University of Michigan, B.S.M.S.E., 2016) in an investigation of sample geometry effects for the activation of martensitic phase transformations in shape memory alloys.
- Advised Jalil Alidoost (University of Michigan, B.S.M.E., 2016) in studies of non-destructive fatal crack detection methods.

Invited presentations

30 Aug. 2017 **LePage W**, Shaw J, Daly S. Multiscale experimental investigation of fatigue cracks in nanocrystalline NiTi. *Young Stress Analyst competition (plenary), International Conference on Advances in Experimental Mechanics*, Sheffield, UK.

25 Aug. 2017 **LePage W**, Shaw J, Daly S. An introduction to optical and SEM digital image correlation with applications for NiTi shape memory alloy. *Medtronic Technical Forum*, Mounds View, Minn.

10 Oct. 2014 **LePage W**. Speaker for dedication ceremony of new addition to U-M Mechanical Engineering building, G.G. Brown Laboratories. One of two doctoral students selected by Prof. Kon-Well Wang, Department Chair. Ann Arbor, Mich.

Presentations

14 July 2017 **LePage W**, Ahadi A, Lenthe W, Sun QP, Pollock T, Shaw J, Daly S. Fatigue cracking in nanocrystalline NiTi SMA. *International Conference on Martensitic Transformations*, Chicago, Ill.

14 June 2017 **LePage W**, Ahadi A, Lenthe W, Sun QP, Pollock T, Shaw J, Daly S. Grain size dependence on fatigue cracking in NiTi SMA. *Society of Experimental Mechanics*, Indianapolis, Ind.

1 Mar. 2017 **LePage W**, Shaw J, Daly S. Multiscale experimental investigation of fatigue crack growth in nanocrystalline NiTi. *The Minerals, Metals and Materials Society*, San Diego, Calif.

23 Aug. 2016 **LePage W**, Shaw J, Daly S. Thermomechanical characterization of shape memory alloy fracture. *International Congress of Theoretical and Applied Mechanics*, Montreal, Canada.

8 June 2016 **LePage W**, Daly S, Shaw J. Cross polarization for improved digital image correlation. *Society of Experimental Mechanics*, Orlando, Fl.

6 June 2016 **LePage W**, Shaw J, Daly S. Grain size effects on fatigue crack growth in nanocrystalline NiTi. *Society of Experimental Mechanics*, Orlando, Fl.

18 Feb. 2016 **LePage W**, Shaw J, Daly S. Thermomechanical characterization of shape memory alloy mode I fracture behavior. *The Minerals, Metals and Materials Society*, Nashville, Tenn.

9 June 2015 **LePage W**, Shaw J, Daly S. Thermomechanical characterization of shape memory alloy mode I fracture behavior. *Society of Experimental Mechanics*, Costa Mesa, Calif.

1 Oct. 2014 **LePage W**, Daly S. Time and surface dependency during fracture of NiTi shape memory alloy. *Society of Engineering Science*, West Lafayette, Ind.

17 June 2014 **LePage W**, Daly S. Fracture and strain rate dependency in NiTi shape memory alloy. *US National Committee on Theoretical and Applied Mechanics*, East Lansing, Mich.

25 May 2014 **LePage W**, Daly S. Fracture and strain rate dependency in NiTi shape memory alloy. *Society of Experimental Mechanics Midwest Student Symposium*, Ann Arbor, Mich.

15 Nov. 2011 **LePage W**, Hampton K, Johnson B, Mayer K, Henshaw J, Purser G. Design and development of a portable off-grid water chlorination system. *International Mechanical Engineering Congress*, Denver, Colo.

Service and outreach

2017–present Board member and lead for Scanning Electron Microscopy Digital Image Correlation (SEM-DIC), Society of Experimental Mechanics DIC Challenge (http://sem.org/dic-challenge).

2014–present Journal article reviewer for *Advanced Materials Interfaces* (1), *Experimental Mechanics* (10), *Journal of Evaluation and Testing* (1), *Journal of Intelligent Material Systems and Structures* (1), *International Journal of Fracture* (1), *Science* (1), *Shape Memory and Superelasticity* (1), and *Ultramicroscopy* (1).

2017 Session chair, International Conference on Martensitic Transformations 2017, Chicago, Ill.

2016–present Volunteer, Science Olympiad assistant coach and assistant coordinator for the Science Olympiad team at Spiritus Sanctus Academy elementary school. Created and maintained a website for communicating with parents, and served as assistant coach for the “On Target” event for four teams of students (grades 2 through 5).

2014–present Guest lecturer for elementary school science classes on the topics of engineering, materials science, agriculture, and climate change.