

Patrick Devin Leahy, PhD

Curriculum Vitae

CONTACT INFORMATION

Fort Lewis College
Department of Physics and Engineering
1000 Rim Drive
Durango, CO 81301
Office: 970-247-6092
Email: pdleahy@fortlewis.edu

PERSONAL INFORMATION

Date of Birth: November 18th, 1981
Place of Birth: Lake Forest, IL
Citizenship: United States of America

FORMAL EDUCATION

PhD in Mechanical Engineering, 2012

Colorado State University, Fort Collins, CO

Advisor: Christian Puttlitz, PhD

Dissertation: *Assessment of the Effects of Ligamentous Injury in the Human Cervical Spine*

2008 Shrake-Culler Scholarship recipient

BS in Mechanical Engineering, 2004

The Ohio State University, Columbus, OH

Dean's List 2001-2004

National Buckeye Plus Merit Scholar 2000-2004

PROFESSIONAL/ACADEMIC EXPERIENCE

Fort Lewis College, Durango, CO. Assistant Professor, Fall 2013-Present

Instructor of engineering mechanics, materials science, and computational methods

Research interests: Composite material characterization, injury biomechanics, finite element analysis

California Polytechnic State University, San Luis Obispo, CA. Full-Time Lecturer, Fall 2012-Spring 2013

Instructor of biomechanical principles, computational methods, fluid mechanics, prosthetic design, and experimental techniques for testing biologic tissues

Co-advisor of SAE (Society of Automotive Engineers) student projects

Colorado State University, Fort Collins, CO. Research Assistant, Fall 2008-Spring 2012

Concentration: Study of cervical spine soft tissue injury and diagnosis specific to whiplash-type trauma via physical experimentation and finite element analysis

Additional research focus: Fiber-reinforced composites mechanics and viscoelastic characterization

Colorado State University, Fort Collins, CO. Teaching Assistant, Fall 2006-Spring 2008

Laboratory instructor of manufacturing processes (machining, casting, forming, welding, and other techniques)

Perfect Power, Inc, Libertyville, IL. Race Vehicle Dynamics Engineer, 1996-2006

Chief designer and production manager of production and racing automotive products

Chief engineer and crew-chief for production-based and prototype cars in the American Le Mans and Grand-Am racing series

Prototype machinist

PEER-REVIEWED PUBLICATIONS

PD Leahy, CM Puttlitz. *Addition of lateral bending range of motion measurement to standard sagittal measurement to improve diagnosis sensitivity of ligamentous injury in the human lower cervical spine.* European Spine Journal, 2016. 25(1): p.122-126.

V Traynelis, J Sherman, E Nottmeier, V Singh, KC McGilvray, CM Puttlitz, **PD Leahy**. *Kinetic analysis of anterior cervical discectomy and fusion supplemented with transarticular facet screws.* Journal of Neurosurgery: Spine, 2014. 20(5): p.485-491.

PD Leahy, CM Puttlitz. *The Effects of Ligamentous Injury in the Human Lower Cervical Spine*. Journal of Biomechanics, 2012. 45(15): p.2668-2672.

WJ Womack, **PD Leahy**, VV Patel, CM Puttlitz. *Finite element modeling of kinematic and load transmission alterations due to cervical intervertebral disc replacement*. Spine (Phila Pa 1976), 2011. 36(17): p.E1126-33.

PD Leahy, BS Smith, KL Easton, CE Kawcak, JC Eickhoff, SS Shetye, CM Puttlitz. *Correlation of mechanical properties within the equine third metacarpal with trabecular bending and multi-density micro-computed tomography data*. Bone, 2010. 46(4): p.1108-13.

ABSTRACTS AND CONFERENCE PROCEEDINGS

AS Mancha, JL Succo, CL Taylor, CT Wecker, KA Bock, TL Leps, **PD Leahy**. *Correlation between NFL Helmet Impact Optimization and On-field Concussions*. (in preparation for 2017 Big Sky Concussion Conference)

PD Leahy, CM Puttlitz. *Mechanical Properties of Injured Human Cervical Spine Ligaments and Corresponding Effect on Spinal Kinematics*. American Society of Mechanical Engineers: Summer Bioengineering Conference. Farmington, PA, June 25, 2011. Podium

PD Leahy, A Antonio, D Radford. *Shape Memory Composites Applied to the Construction of a Conformable Racing Car Seat*. Society of Automotive Engineers International: Motorsports Engineering Conference & Exposition. Concord, NC, December 2, 2008. Podium

PD Leahy, CM Puttlitz. *Application of Lateral Bending Range of Motion Measurement to Improve Diagnosis Sensitivity of Cervical Spine Ligamentous Injuries*. Orthopaedic Research Society Annual Meeting. San Diego, CA, March 19-22, 2017. Poster

PD Leahy, KC McGilvray, J Sherman, V Traynelis, E Nottmeier, V Singh, B Murrell, V Patel, CM Puttlitz. *Analysis of Anterior Cervical Discectomy and Fusion Kinematics when Supplemented with Facet Screw Instrumentation*. American Association of Neurological Surgeons (AANS): 80th Annual Scientific Meeting. Miami, FL, April 14-18, 2012. Poster

PD Leahy, KC McGilvray, J Sherman, V Traynelis, E Nottmeier, V Singh, B Murrell, V Patel, CM Puttlitz. *Kinematic Assay of Multi-Level Anterior Cervical Discectomy and Fusion with Supplementary Facet Screw Instrumentation*. Congress of

Neurological Surgeons (CNS): 2012 Annual Meeting of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves. Orlando, FL, March 7-10, 2012. Poster

PD Leahy, KC McGilvray, J Sherman, V Traynelis, E Nottmeier, V Singh, B Murrell, V Patel, CM Puttlitz. *Analysis of Anterior Cervical Discectomy and Fusion Kinematics when Supplemented with Facet Screw Instrumentation*. Orthopaedic Research Society (ORS): Annual Meeting 2012. San Francisco, CA, February 4-7, 2012. Poster

PROFESSIONAL SERVICE & AFFILIATIONS

Service

New Bachelor's Degree Programs Summit Team committee	2017-present
Tenure-track engineering faculty search committee	2016-present
Art in Public Places Selection Committee	2015-present
SAE student projects advisor	2012-present
ABET competency assessment exam creator	2014-present
Manufacturing mentor	2000-present
Academic Policy Committee	2014-2017
Project Advisor for La Plata Humane Society patient treatment	2016
President's Scholar Contact Professor	2016
CO-AMP research advisor	2015-2016
Tenure-track engineering faculty search committee	2015-2016
Achievement Scholarship Program mentor	2013-2015
NIH Minority Access to Research Careers (pre-MARC) advisor	2013-2015
Tenure-track chemistry faculty search committee	2014
Physics and Engineering Lab Coordinator search committee	2014
Tenure-track engineering faculty search committee	2013-2014

Affiliations (Past & Present)

American Society of Mechanical Engineers (ASME)
 Orthopaedic Research Society (ORS)
 Society of Automotive Engineers (SAE)

AD HOC MANUSCRIPT REVIEWER

Acta Astronautica

International Journal of Computer Assisted Radiology and Surgery

Journal of Biomechanical Engineering (multiple reviews)

Journal of Biomechanics

STUDENTS SUPERVISED

Elizabeth Endersbe James Greene Rachael Helvoigt	Cornell University REU	2017
Bryce Boren Graham Goldwater Conner McCasland Alex Milewski Austin Shupe Dylan Terry Cord Tiley	Senior Design Project	2016-2017
Pamela Bogust Dillon Bruce Nicholas Carlson Trevor Gomez Michael Hesper	Senior Design Project	2015-2016
Sophie Mancha	CO-AMP program	2015-2016
Tiffany Gus Emilio Rivera	NSF-STEP FOCUSS program	2015
Sophie Mancha	NIH pre-MARC program	2013-2015
Daniel Abshire Dillon Hughes Gavin Martinez	Senior Design Project	2014-2015

Cody Montoya

Michael Revak

Justin Succo

NSF-STEP FOCUSS program

2014

Chantel Taylor

Theo Wecker

Kevin Bock

Senior Design Project

2013-2014

Luke Hullinger

Steven O'Malley

Brendan Shafer

Scott Watkins

TEACHING EXPERIENCE

Assistant Professor, Fort Lewis College

2013-Present

Engineering Fundamentals I (ENGR 103)

Engineering Fundamentals III (ENGR 215)

Measurement and Instrumentation Laboratory (ENGR 271)

Engineering Design and Practice (ENGR 315)

Authored: Mechanics of Materials (ENGR 317)

Authored: Materials Science (ENGR 318)

Authored: Materials/Mechanics Laboratory (ENGR 319)

Authored: Finite Element Analysis (ENGR 350)

Authored: Machine Design (ENGR 409)

Senior Seminar I & II (ENGR 496/7)

Full-Time Lecturer, California Polytechnic State University

2012-2013

Authored: Biomedical Engineering Management and Analysis (BMED 310)

Biomechanics (BMED 410)

Biomedical Engineering Transport (BMED 425)

Authored: Bioengineering Design I (BMED 455)

Authored: Bioengineering Design II (BMED 456)

Authored: Biomedical Engineering Horizons (BMED 512)

Guest Lecturer, Montana State University Design for Manufacturing and Tooling (ETME 415)	2012
Guest Lecturer, Colorado State University Machine Design (MECH 325)	2010
Laboratory Instructor, Colorado State University Introduction to Manufacturing Processes (MECH 200)	2006-2008
Race Driving Coach, Perfect Power, Inc	2001-2006

RESEARCH SUPPORT

Active/Approved

PD Leahy – *“Measurement of Stress Gradient Across Specimen in Pure Bending, and Continuation of Air Force Research Laboratory Residual Stress Measurements in Powder Bed Fusion Fabricated Titanium.”* Total: \$27,120

Funding Agency: Cornell University REU/Department of Education

Period of Funding: 6/4/2017-8/4/2017

Pending

PD Leahy (PI), Christian Puttlitz (Co-I), Vikas Patel (Co-I) – *“Finite Element Modeling of Loading Alterations in the Human Cervical Spine due to Intervertebral Disc Prostheses.”* (R15AR072929). Total: \$187,761

Funding Agency: National Institutes of Health (NIH-NAIMS)

Period of Funding: 9/1/2017-8/31/2018

Concluded

PD Leahy – *“Application of Lateral Bending Range of Motion Measurement to Improve Diagnosis Sensitivity of Cervical Spine Ligamentous Injuries, Conference Presentation”* Total: \$2,396

Funding Agency: Fort Lewis College TS/R, Fort Lewis College Foundation

Period of Funding: 3/18/2017-3/22/2017

PD Leahy – *“Correlation Between Impact Intensity and Duration to Concussion Frequency.”* Total: \$4,000

Funding Agency: Colorado Louis Stokes Alliance for Minority Participation (CO-AMP)

Period of Funding: 5/1/2015-9/1/2015

PD Leahy – *“Design of a High Performance UTV Jack for Mass Production.”* Total: \$1,100

Funding Agency: Ska Fabricating

Period of Funding: 1/12/2015-5/3/2016

PD Leahy – *“Development of High-Performance, Fracture-Tuned Composite Helmets.”* Total: \$15,260

Funding Agency: Four Corners Undergraduate STEM Success (FOCUSS) (National Science Foundation NSF-STEP program)

Period of Funding: 5/7/2015-8/31/2015

PD Leahy – *“Concussion Frequency by Impact Location in NFL Competition.”* Total: \$6,355

Funding Agency: Minority Access to Research Careers (pre-MARC)/National Institutes of Health (NIH)

Period of Funding: 12/7/2013-4/30/2015

PD Leahy – *“Correlation between NFL Helmet Impact Optimization and On-field Concussions.”* Total: \$17,840

Funding Agency: Four Corners Undergraduate STEM Success (FOCUSS) (National Science Foundation NSF-STEP program)

Period of Funding: 5/12/2014-9/1/2014

PD Leahy – *“Rotational acceleration measurement equipment for helmet tester.”* Total: \$700

Funding Agency: Fort Lewis College Foundation

Period of Funding: 4/4/2014

Not Funded

William Nollet (PI), **PD Leahy (Co-I)** – *“Process for Inspection and Verification of non-critical Hardware.”* Total: \$118,857

Funding Agency: NASA

Period of Funding: 2017

William Nollet (PI), **PD Leahy (Co-I)** – *“Additive Manufacturing Process Study.”* Total: \$118,857

Funding Agency: NASA

Period of Funding: 2017

Daudi Barnes, William Nollet, **PD Leahy (CI)** – *“MARS: Mars Ascent, Descent & Reaction Control Systems.”* Total: \$125,000

Funding Agency: NASA-SBIR

Period of Funding: 7/1/2016-7/1/2017

Daudi Barnes, William Nollet, **PD Leahy (CI)** – *“FIRE: Fully-Integrated Return Engine.”* Total: \$125,000

Funding Agency: NASA-SBIR

Period of Funding: 7/1/2016-7/1/2017

Erin Lehmer, Shere Byrd, David Blake, Steve Fenster, Les Sommerville, Kenny Miller, Bill Collins, Katie Mouzakis, Aimee Morris, Brian Burke, Sharon Sears, Sue Krauss, Melissa Knight, Missy Thompson, **Devin Leahy** – *“Integrated Biomedical Research Initiative (IBRI) - Student Training Core Program.”*

Funding Agency: National Institutes of Health (NIH-BUILD)