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Benjamin C Gadomski, Ph.D.

FORMAL EDUCATION

Doctor of Philosophy (Ph.D.), Bioengineering 2015
School of Biomedical Engineering
Colorado State University, Fort Collins, CO

Bachelor of Science (B.S.), Mechanical Engineering 2009
Department of Mechanical Engineering
Trine University, Angola, IN

RESEARCH EXPERIENCE

Assistant Research Professor 2018-Present
Manager, Orthopaedic Bioengineering Research Laboratory
Department of Mechanical Engineering, Colorado State University, Fort Collins, CO

- Develop and design preclinical studies for industry collaborators
- Manage team of scientists, technicians, and administrative staff
- Design and perform *in vivo* and *ex vivo* experiments in the areas of spine, fracture repair, tendon/ligament, cartilage, meniscus, and spinal cord.
- Serve as Orthopaedic Bioengineering Research Laboratory contact for all industry projects

Graduate Research Assistant 2009-2015
Orthopaedic Bioengineering Research Laboratory
Department of Mechanical Engineering, Colorado State University, Fort Collins, CO

- Utilized finite element computational tools to investigate airway management for the cervical spine during intubation procedures
- Developed simulation technique of microgravity unloading in a large animal model for NASA via *in vitro* and *in vivo* experiments
- Worked collaboratively with orthopaedic surgeons to develop novel surgical technique for the implantation of external fixation hardware
- Investigated bone fracture healing *in vivo* and implemented therapeutic countermeasures under simulated microgravity loading conditions
- Managed collaborative group of over 20 members including surgeons, technicians, interns, and students
- Developed and validated several state-of-the-art high-fidelity finite element models using Abaqus and ProEngineer Software
- Developed and patented four spinal implant devices through experimental and computational techniques

TEACHING EXPERIENCE

Assistant Professor of Practice 2015-2018
Department of Mechanical Engineering, Colorado State University, Fort Collins, CO
Courses*: Engineering Design II MECH202 (Fall 2016, Class size: 95, Instructor Rating: 4.9/5.0; Spring 2017, Class size:143, Instructor Rating: 4.9/5.0; Summer 2017, Class size: 26, Instructor Rating: 4.9/5.0; Fall 2017, Class size: 119, Instructor Rating: 4.6/5.0; Fall 2018, Class size: 117, Instructor Rating: 4.6/5.0; Spring 2018, Class size: 116, Instructor Rating: 4.8/5.0)*

Engineering Design III MECH301 (Spring 2018, Class size: 228, Instructor Rating: 4.3/5.0)

Machine Design MECH325 (Fall 2016, Class size: 92, Instructor Rating: 4.9/5.0)

Dynamics of Machinery MECH324 (Summer 2016, Class size: 19, Instructor Rating: 5.0/5.0; Summer 2017, Class size: 26, Instructor Rating: 5.0/5.0)

Introduction to Engineering Experimentation MECH231 (Spring 2016, Class size: 139, Instructor Rating: 4.8/5.0; Summer 2016, Class size: 29, Instructor Rating: 5.0/5.0; Fall 2016, Class size: 119, Instructor Rating: 4.8/5.0; Fall 2017, Class size: 119, Instructor Rating: 4.8/5.0)

Problem Based Learning in Biomedical Engineering BIOM300 (Spring 2016, Class size: 71, Instructor Rating: 4.8/5.0; Spring 2017, Class size: 57; Instructor Rating: 4.9/5.0; Spring 2018, Class size: 81, Instructor Rating 4.1/5.0) 2016-2017

Senior Design Faculty Advisor 2013-2016
Department of Mechanical Engineering, Colorado State University, Fort Collins, CO
Project: Design and creation of an electromechanical material testing machine

Guest Lecturer
Department of Mechanical Engineering, Colorado State University, Fort Collins, CO
Machine Design MECH325
- Taught 15 classes over two semesters

Bioengineering BIOM570
- Taught 6 classes on biomechanics

Musculoskeletal Biosolid Mechanics MECH578 2011-2012
- Taught 6 laboratory lectures on finite element analysis

Graduate Teaching Assistant
School of Biomedical Engineering, Colorado State University, Fort Collins, CO
Courses: Human Physiology BIOM 480 (Fall 2011 – Spring 2012)
- Designed and implemented a new, online, graduate-level human physiology course
- Organized course teaching materials and created assignments and exams

UNIVERSITY SERVICE

American Society of Mechanical Engineers Faculty Advisor 2017-Present

Tau Beta Pi Faculty Advisor 2017-2018
Colorado State University, Fort Collins, CO

Senior Undergraduate Honors Advisor 2016-2018
Students: Eric Kaliamos, Joshua Smith

Graduate Affairs Committee Student Member 2014-2015
School of Biomedical Engineering, Colorado State University, Fort Collins, CO

Graduate Student Showcase Faculty Judge 2015
Colorado State University, Fort Collins, CO

PEER-REVIEWED PUBLICATIONS

1. X Sun, X Gao, Z Deng, L Zhang, K McGilvray, **BC Gadomski**, S Amra, G Bao, J Huard. "High bone microarchitecture, strength, and resistance to bone loss in MRL/MpJ mice correlates with activation of different signaling pathways and systemic factors." FASEB J, Accepted 2019.
2. BJ Hindman, RW Woodroffe, M Zanaty, H Kawasaki, S Yamaguchi, CM. Puttlitz, **BC Gadomski**. "C1-C2 motion during C-MAC D-blade videolaryngoscopy and endotracheal intubation in 2 patients with Type II odontoid fractures: A case report." A&A Practice, 2019.
3. **BC Gadomski**, KC McGilvray, JT Easley, RH Palmer, J Jiao, X Li, Y-X. Qin, CM Puttlitz. "An investigation of shock wave therapy and low-intensity pulsed ultrasound on fracture healing under reduced loading conditions in an ovine model." J Orthopaed Res 35, 2017.
4. **BC Gadomski**, SS Shetye, BJ Hindman, F Dexter, BG Santoni, MM Todd, VC Traynelis, RP From, RB Fontes, CM Puttlitz. "Intubation biomechanics: validation of a finite element model of cervical spine motion during endotracheal intubation in intact and injured conditions." J Nuerosurg Spine 28, 2017.
5. **BC Gadomski**, ZF Lerner, RC Browning, JT Easley, RH Palmer, CM Puttlitz. "Computational characterization of fracture healing under reduced gravity loading conditions." J Orthopaed Res 34, 2016.
6. **BC Gadomski**, KC McGilvray, JT Easley, RH Palmer, EJ Ehrhart, KK Haussler, RC Browning, B Santoni, CM Puttlitz. "Partial Gravity Unloading Inhibits Bone Healing Responses in Haversian Bone Systems." J Biomech 47, 2014.
7. **BC Gadomski**, KC McGilvray, JT Easley, RH Palmer, EJ Ehrhart, KK Haussler, RC Browning, B Santoni, CM Puttlitz. "An *in vivo* ovine model of bone tissue alterations in simulated microgravity conditions." J Biomech Engr 136, 2014.
8. ZF Lerner, **BC Gadomski**, A Ipson, KK Haussler, CM Puttlitz, RC Browning. "Modulating tibiofemoral contact force in the sheep hindlimb via treadmill walking: Predictions from an OpenSim musculoskeltal model. J Orthopaed Res 33, 2015.
9. UM Ayturk, **B Gadomski**, D Schuldt, V Patel, CM Puttlitz. "Modeling degenerative disk disease in the lumbar spine: a combined experimental, constitutive, and computational approach." J Biomech Engr 134, 2012.
10. D Woldtvedt, W Womack, **B Gadomski**, D Schuldt, CM Puttlitz. "Finite element lumbar spine facet contact parameter predictions are affected by the cartilage thickness distribution and initial joint gap size." J Biomech Engr 133, 2011.

REFEREED CONFERENCE PROCEEDINGS

† indicates oral podium presentation

1. RH Palmer, **BC Gadomski**, KM Labus, KC McGilvray, BB Nelson, HL Stewart, CM Puttlitz, JT Easley. "Evaluation of a novel, resorbable interference screw for CrCL Reconstruction." Veterinary Orthopedic Society Conference; Sun Valley, ID, 2020.
2. **BC Gadomski**, KM Labus, KM McGilvray, B Nelson, R Palmer, H Stewart, CM Puttlitz, J Easley. "Development of a novel, resorbable interference screw for tendon attachment." 65th Annual Meeting of the Orthopedic Research Society; Phoenix, AZ, 2020.
3. **BC Gadomski**, K Labus, C Puttlitz, K McGilvray, H Seim, B Nelson, J Easley. "Evaluation of lumbar spinal fusion utilizing Recombinant Human Platelet Derived Growth Factor-B Chain Homodimer combined with Bovine Collagen/β-Tricalcium Phosphate in an ovine model." 65th Annual Meeting of the Orthopedic Research Society; Phoenix, AZ, 2020.
4. EW Brodin, KT Steward, **BC Gadomski**, Q Smith, KC McGilvray, JT Easley. "Intramedullary nailing in the ovine metatarsus: A more consistent alternative to plating?" 65th Annual Meeting of the Orthopedic Research Society; Phoenix, AZ, 2020.
5. Steward SK, Brodin EW, **Gadomski BC**, Easley JT. "Ewe Nailed It: Application of Locking Intramedullary Nails in the Ovine Metatarsus. American College of Veterinary Surgeons; Las Vegas, NV, 2019.
6. Downey AC, McGilvray KC, **Gadomski B**, Baer K, Kappel SM, Nout-Lomas Y, Seim II HB, Seim IV H, Easley JT. "In Vitro Biomechanical Analysis of Novel Equine Cervical Stabilization Technique." American College of Veterinary Surgeons; Las Vegas, NV, 2019.
7. **BC Gadomski**, BJ Hindman, M Page, MM Todd, VC Traynelis, CM Puttliz. "Changes in applied laryngoscope force affect peak spinal cord strain." International Anesthesia Research Society; Montreal, CA 2019.
8. †**BC Gadomski**, BJ Hindman, BG Santoni, MM Todd, VC Traynelis, RB Fontes, CM Puttlitz. "Peak Cervical Spinal Cord Strain Predictions are Affected by the Point of Force Application during Direct Laryngoscopy." International Anesthesia Research Society; Washington DC, 2017. – Kosaka Best of Meeting Top Finalist in Clinical Research Award
9. **BC Gadomski**, SS Shetye, BJ Hindman, BG Santoni, MM Todd, VC Traynelis, RB Fontes, CM Puttlitz. "The effect of cervical spine injury on intervertebral kinetics and spinal cord strain during direct laryngoscopy: A computation investigation." 61st Annual Meeting of the Orthopedic Research Society; San Diego, CA, 2016.
10. **BC Gadomski**, SS Shetye, BJ Hindman, BG Santoni, MM Todd, VC Traynelis, RB Fontes, CM Puttlitz. "Computational modeling of direct laryngoscopy and the effect of cervical spine injury on intervertebral kinetics." International Anesthesiology Research Society; San Francisco, CA, 2016.
11. †**BC Gadomski**, Y-X. Qin, J. Jiao, KC McGilvray, JT Easley, RH Palmer, CM Puttlitz. "Shock wave therapy and low-intensity pulsed ultrasound accelerate bone formation rates under simulated microgravity conditions." NASA Human Research Program Investigators' Workshop; Galveston, TX, 2016.
12. **BC Gadomski**, ZF Lerner, RC Browning, CM Puttlitz. "A finite element investigation of fracture healing under simulated microgravity loading conditions." Summer Biomechanics, Bioengineering and Biotransport Conference; Snowbird, UT, 2015.
13. **BC Gadomski**, KC McGilvray, JT Easley, RH Palmer, D Ruehlman, M Roberts, CM Puttlitz. "Shock wave therapy does not enhance acute fracture strength but may accelerate formation rates under simulated microgravity conditions." NASA Human Research Program Investigators' Workshop; Galveston, TX, 2015.
14. **BC Gadomski**, ZF Lerner, RC Browning, CM Puttlitz. "Finite element modeling of the ovine hindlimb for the investigation of microgravity-related mechaniobiological alterations." 60th Annual Meeting of the Orthopedic Research Society; Las Vegas, NV, 2015.
15. **BC Gadomski**, ZF Lerner, RC Browning, CM Puttlitz. "Development and validation of a finite element model of the ovine hindlimb for the investigation of microgravity loading on skeletal tissue healing." World Congress of Biomechanics; Boston, MA, 2014.
16. **BC Gadomski**, KC McGilvray, JT Easley, RH Palmer, CM Puttlitz. "Evaluation of Haversian bone fracture healing in simulated microgravity." NASA Human Research Program Investigators' Workshop; Galveston, TX, 2014.
17. †**BC Gadomski**, KC McGilvray, JT Easley, RH Palmer, CM Puttlitz. "Simulating microgravity in a large animal model." ASME Summer Bioengineering Conference; Sunriver, OR, 2013.
18. **BC Gadomski**, CM Puttlitz. "Design of a dynamic stabilization device for the correction of the center of rotation in lumbar spine." International Society for the Advancement of Spine Surgery; Vancouver, Canada, 2013.
19. †**BC Gadomski**, KC McGilvray, JT Easley, RH Palmer, CM Puttlitz. "Evaluation of a ground-based ovine model of simulated microgravity." NASA Human Research Program Investigators' Workshop; Galveston, TX, 2013.
20. **BC Gadomski**, CM Puttlitz. "Experimental evaluations of intervertebral disc mechanics following posterolateral fusion are dependent on testing protocol." 58th Annual Meeting of the Orthopedic Research Society; San Francisco, CA, 2012.
21. **BC Gadomski**, KC McGilvray, JT Easley, RH Palmer, CM Puttlitz. "An ovine model of simulated microgravity." NASA Human Research Program Investigators' Workshop; Houston, TX, 2012.
22. **B Gadomski**, J Rasmussen, CM Puttlitz. "Implementation of physiological muscle loading in a finite element model of the human lumbar spine." 57th Annual Meeting of the Orthopaedic Research Society; Long Beach, CA, 2011.
23. †**BC Gadomski**, J Rasmussen, CM Puttlitz. "The effect of muscle loading on internal mechanical parameters of the lumbar spine: a finite element study." ASME Summer Bioengineering Conference; Farmington, PA, 2011.
24. †**BC Gadomski**, J Rasmussen, P Galibarov, CM Puttlitz. "The effect of coupled motions and lifting tasks on human lumbar nucleus pressures and annulus fibrosis stresses in a muscle-loaded finite element model." International Society for Biomechanics; Brussels, Belgium, 2011.

PATENTS

1. CM Puttlitz, **BC Gadomski**. "Interspinous spacer devices for dynamic stabilization of degraded spinal segments." United States Patent US 8,945,185 B2; Issued February 2015.
2. CM Puttlitz, **BC Gadomski**. "Pedicle screw assembly and dynamic spinal stabilization devices incorporating the pedicle screw assembly." United States Patent US 9,226,779 B2; Issued January 2016.
3. CM Puttlitz, **BC Gadomski**, "Interspinsous spacer devices for dynamic stabilization of degraded spinal segments." United States Patent US 9,603,633 B2: Issued March 2017.
4. CM Puttlitz, **BC Gadomski**. "Pedicle screw assembly and dynamic spinal stabilization devices incorporating the pedicle screw assembly." United States Patent US 9,636,149 B2; Issued May 2017.

HONORS AND AWARDS

- Team Interdisciplinary Scholarship Award, Colorado State University, 2019
- Colorado State University Engineering College Council Best Professor Award, 2018
- Colorado State University Scott College of Engineering Outstanding Teaching and Service Award, 2017
- Colorado State University College of Engineering Patent Award, 2017
- Kosaka Best of Meeting Top Finalist in Clinical Research, International Anesthesia Research Society, 2017
- Colorado State University Engineering College Council Best Professor Award Nomination, 2015
- Colorado State University College of Engineering Patent Award, 2015
- 2th Place AG, USA Duathlon National Championship, 2015
- 1st Place Winner, ASME Summer Bioengineering Conference Ph.D. Competition, 2013
- Colorado State University School of Biomedical Engineering Travel Award, 2013
- Colorado State University Graduate School Travel Award, 2013
- 4th Place AG, USA Duathlon National Championship, 2013
- Trine University Renaissance Scholar Award, 2009
- Engineer in Training (E.I.T.) certification, 2009
- Tau Beta Pi Engineering Honor Society; Indiana Epsilon Chapter President, 2008; Colorado Delta Chapter Faculty Advisor, 2017-Present
- Pi Tau Sigma, National Mechanical Engineering Honor Society, 2008
- FEF Robert V. Wolf Memorial Scholarship Award, 2008