

Jakob Wolynski

Jake.Wolynski@colostate.edu

303-648-1545

EDUCATION

Doctorate of Philosophy, Biomedical Engineering

Anticipated: December 2021

Colorado State University (CSU); Fort Collins, CO

Dissertation: "Early Prediction of Bone Fracture Healing Outcome by Novel Mechanical Diagnostic Techniques"

Bachelor of Science, Biomedical Engineering

May 2017

Bachelor of Science, Mechanical Engineering

Colorado State University; Fort Collins, CO

Magna Cum Laude

PROFESIONAL & ACADEMIC EXPERIENCE

Graduate Research Assistant

August 2017 – Present

Colorado State University; Fort Collins, CO

- Assisted in data collection and analysis for preclinical assessment of novel orthopaedic technologies
- Designed and fabricated fixtures for biomechanical testing of cadaveric tissues and orthopaedic devices

Graduate Teaching Assistant

August 2017 – December 2017

Colorado State University; Fort Collins, CO

- Mentored 60 engineering students in the operation of machining equipment for prototype development
- Advised mechanical engineering students on fabrication techniques and design for manufacturing

Research Fellowship

May 2016 – August 2016

Jaipur, India

- Researched the failure mechanisms of a prosthetic foot to improve its implementation in developing nations
- Collaborated with an international team of colleagues and advisors to quantify prosthesis performance
- Produced a finite element model using Abaqus to evaluate the efficacy of prosthesis design changes

PROJECT EXPERIENCE

Bone Fracture Healing Prediction

August 2017 – Present

Colorado State University; Fort Collins, CO

- Developed novel technologies to improve clinical diagnosis of failed bone fracture healing by up to five months
- Coordinated with veterinary surgeons to implement preclinical comparative animal studies
- Created patient-specific finite element models to predict bone fracture healing biomechanics
- Produced custom structural and numerical models of fracture healing to validate experimental data
- Performed market and voice-of-customer analyses to identify product design requirements

Custom Wedge Osteotomy Guide

May 2018 – April 2019

Colorado State University; Fort Collins, CO

- Conferred with veterinary surgeons to define design characteristics for a novel orthopaedic surgical device
- Designed and fabricated a surgical cutting guide to enable patient specific surgical procedures

Spinal Testing Fixture

August 2016 – May 2017

Colorado State University; Fort Collins, CO

- Collaborated with a multi-disciplinary team to develop a device for automated testing of spinal orthopaedics
- Utilized Solidworks CAD software to design a fixture capable of biomechanically loading cadaveric spinal tissue
- Complied with extensive adviser-defined design requirements

PEER-REVIEWED JOURNAL PUBLICATIONS

1. **Wolynski, J.G.**, Labus K.M., Easley, J.T., Notaroš, B.M., Puttlitz, C.M., McGilvray, K.C.
Currently in review: “Diagnostic Prediction of Ovine Fracture Healing Outcome by Novel Multi-Location Direct Electromagnetic Coupling Antennae”.
2. **Wolynski, J.G.**, Sutherland, C.J., Demir, V.H., Unal, E., Alipour, A., Puttlitz, C.M., McGilvray, K.C.
“Utilizing Multiple BioMEMS Sensors to Monitor Orthopaedic Strain and Predict Bone Fracture Healing”. *Journal of Orthopaedic Research*. 37(9). 1873-1880. 2019.
3. Shamir, S.K., **Wolynski, J.G.**, Duncan C.G., Puttlitz, C.M., Duerr, F.M.
“Ex Vivo Evaluation of a Novel Surgical Guide on the Accuracy of Closing Wedge Osteotomies”. *Veterinary Surgery*. 48(8). 1429-1436. 2019.
4. **Wolynski, J.G.**, Wheatley, B.B., Mali, H. S., Jain, A.K., Haut Donahue, T. L.
“Finite Element Analysis of the Jaipur Foot: Implications for Design Improvement”. *Journal of Prosthetics and Orthotics*. 31(3). 181-188. 2019.
5. Huber, I., Fischenich, K. M., **Wolynski, J.G.**, Niese, B., Teater, R., Mali, H. S., Haut Donahue, T. L.
“Epidemiological Study of Failures of the Jaipur Foot”. *Disability and Rehabilitation: Assistive Technology*. 13(8). 740-744, 2018.

SKILLS

- Matlab
- Labview
- Solidworks
- Endnote
- Abaqus CAE
- Machining
- Creo Parametric
- Microsoft Office

HONORS & AWARDS

- John & Leslie Malone Research in Development Award, CSU Translational Medicine Institute, January 2020
- Innovation in Engineering Award, CSU Ventures Demo Day, May 2019
- CSU Programs for Research and Scholarly Excellence Fellowship, November 2017
- Award for Outstanding Academics, CSU, School of Biomedical Engineering, May 2017
- University Honors Scholar, CSU, May 2017

VOLUNTEER EXPERIENCE

Volunteer Instructor

September 2015 – August 2018

Power Mountain Engineering; Fort Collins, CO

- Mentored high school students in the design and fabrication of a supersonic ping pong ball launcher
- Tutored students in engineering principles regarding supersonic fluid flow
- Directed students in safe manufacturing and fabrication operations

Research Volunteer

August 2015 – May 2017

Colorado State University; Fort Collins, CO

- Assisted in biomechanical testing of cadaveric tissue to quantify orthopaedic device performances
- Completed data analysis to extract engineering properties from biomechanical testing results
- Designed and fabricated test fixtures for use in evaluating the performance of orthopaedic technologies