

# Riley Knox

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## PROFILE

Robotics student and biomedical engineer with a background in mechanical design, research and development, and device production. Experienced in mechanical testing and simulation, design conceptualization and execution, data analysis and spreadsheet manipulation, materials evaluation and selection, and device prototyping and production. Spatially minded, organized, detail oriented, motivated, and self-taught.

## EDUCATION

Northwestern University

Master of Science: Robotics

September 2019 – Present

University of California, Davis

Bachelor of Science: Biomedical Engineering, emphasis in Biomechanics

September 2010 – June 2015

## EXPERIENCE

### Orthopaedic Trauma Institute, University of California, San Francisco, CA

Biomechanics Research & Development Engineer

January 2017 – August 2019

- Evaluated strength and long-term viability of orthopedic surgery techniques using cadaver-based mechanical testing
- Published four articles in medical research journals and presented work at conferences
- Designed and carried out test protocols, including designing software processes and implementing custom mechanical hardware solutions
- Analyzed laboratory data for inclusion in scientific abstracts and professional journals and contributed extensively to manuscript writing process
- Performed finite element analysis of surgical constructs to validate experimental results and produce predictive reports for colleagues and external clients

### LIM Innovations, San Francisco, CA

Support & Service Technician

May 2016 – August 2016

Production & Clinical Research Intern

February 2016 – May 2016

- Conceptualized and designed the company raw materials tracking protocol, integrating input from the production team and inventory department
- Fabricated, modified, and repaired transfemoral and transtibial prosthetic sockets and documented standardized processes
- Performed final quality control checks on prosthetic sockets, collaborating with the production team and on-site clinicians
- Designed a research and development initiative to develop a sensor assembly capable of measuring clinical data while a patient wore the prosthetic socket

## SKILLS

Production: Machining, 3D Printing  
CAD: SolidWorks, Autodesk Fusion  
Material Testing & Mechanics  
Programming: Python  
Robotic Operating System (ROS)  
Finite Element Analysis: ANSYS  
Technical Writing

## RELEVANT COURSES

Embedded Systems in Robotics  
Statics, Dynamics, Mechanics  
Biomaterials  
Systemic Human Physiology  
Biomedical Instrumentation  
Bioengineering Design  
Robotic Manipulation

## PROJECTS

ROS Mini-Golf Robot  
Python Finger Painting with Computer Vision  
Python KUKA youBot Pick-and-Place Simulation  
Senior Capstone: Electronic Goniometer

## PUBLICATIONS

- **Knox R**, Curran P, Herfat S, Kandemir U, Marmor M. “The influence of mini-fragment plates on the mechanical properties of long-bone plate fixation.” *Orthopaedic Trauma Association International*. 2019 Sep; 2(3): e034.
- Marmor M, **Knox R**, Huang A, Herfat S. “Acetabulum cup stability in an early weight-bearing cadaveric model of geriatric posterior wall fractures.” *Journal of Orthopaedic Trauma*. 2020 Jan; 34(1): 55-61.
- Marmor M, Huang A, **Knox R**, Herfat S, Firoozabadi R. “Mapping of the stable articular surface and available bone corridors for cup fixation in geriatric acetabular fractures.” *Journal of the American Academy of Orthopaedic Surgeons*. 2019 Sep 25.
- Hoogervorst P, **Knox R**, Tanaka K, Working Z, El Naga A, Herfat S, Lee N (in press). “A biomechanical comparison of fiberglass casts and 3 dimensional printed, open-latticed, ventilated casts.” *Hand*. 2019 Feb 27.
- Marmor M, Charlu J, **Knox R**, Curtis W, Herfat S. “Use of standard musculoskeletal ultrasound to determine the need for fasciotomy in an elevated muscle compartment pressure cadaver leg model.” *Injury*. 2019 Mar; 50(3): 627-632.

*References available upon request*