

BME Seminar

Friday, March 13, 2026

10:00 – 11:00 am, ET 302

(799 West Michigan St., IN 46202)

Microsoft Teams meeting

Join: <https://teams.microsoft.com/join/23283748329332?p=BwXATxp7MOAZQEe7Pg>

Meeting ID: 232 837 483 293 32

Passcode: oV3Cy3hF

“Anatomics: Co-engineering Body and Machine to Improve Bionic Performance”



Tyler Clites, PhD

Assistant Professor of Mechanical and Aerospace Engineering

Affiliate Faculty of Orthopaedic Surgery and Bioengineering

Director of the Anatomical Engineering Group

University of California, Los Angeles

anatomics.seas.ucla.edu

Abstract: Bionic systems are no longer the stuff of science fiction. Exoskeletons and prostheses restore mobility to people with physical disabilities and augment able-bodied performance. Implants can eliminate pain and allow long-term restoration of function. Although a complete bionic system is made up of biological structures (“the body”) and mechatronics (“the machine”), the traditional development approach focuses solely on engineering the machine. As a result, even the most advanced bionic systems are subject to fundamental limitations of the human body. Turning this paradigm on its head, Prof. Clites has introduced the concept of anatomics, in which body and machine are developed in parallel. In this seminar, Prof. Clites will provide examples of how his laboratory has applied the anatomics framework to a range of clinical problems including amputation, limb salvage, joint replacement, and paralysis. He will show entirely novel solutions to long-standing clinical problems, including compliant-mechanism-based orthopaedic implants, electromagnetic attachment of external prostheses to the body, and sensate prosthetic devices that are covered in human skin. He will also showcase the breadth of data that his team has produced in optimizing and validating these solutions, including theoretical analysis, simulation, benchtop experiments, cadaver testing, animal testing, and biomechanical experimentation with human subjects.

Bio: Tyler Clites is an Assistant Professor of Mechanical and Aerospace Engineering at UCLA, with joint appointments Bioengineering and the Department of Orthopaedic Surgery at UCLA’s David Geffen School of Medicine. Prof. Clites earned his Ph.D. in 2018 from the Harvard/MIT program in Health Sciences and Technology, where he led the development of a novel surgical procedure for limb amputation to improve neural interfacing and control. He then did a postdoc in Mechanical Engineering and Robotics at the University of Michigan. At UCLA, Prof. Clites directs the Anatomical Engineering Group, where his research is focused on co-engineering body and machine to improve human movement ability. His work has been published in clinical and engineering journals, and featured at TED, in The New Yorker and The New York Times, and on 60 Minutes and CNN.