Daniel A. **Hagen**

1060 20th St. #4, Santa Monica, CA 90403

(+1) 626-340-6994 | daniel8hagen@gmail.com | daniel8hagen.com | danhagen | daniel-a-hagen

EDUCATION

University of Southern California, Viterbi School of Engineering
Los Angeles, CA

Doctor of Philosophy in Biomedical Engineering
May 2016 - Exp. May 2020

- GPA: 3.97 • Recipient of the Provost Fellowship • Relevant Coursework: Linear Systems Theory, Nonlinear and Adaptive Control

University of Southern California, Viterbi School of Engineering
Los Angeles, CA

Master of Science in Biomedical Engineering
January 2015 - May 2016

- GPA: 3.95 • Relative Coursework: Neuromuscular Systems, Applied Electrophysiology, Physiological Control Systems

University of Arizona
Tucson, AZ

Bachelor of Science in Mathematics
August 2006 - May 2010

- GPA: 3.60 • Minors: Chemistry, Biochemistry

SKILLS

- English (Native)
- Python
- MATLAB & Simulink
- CAD (Fusion 360)
- Adobe Illustrator
- Microsoft Office (Excel, Word, PowerPoint)
- LaTeX
- OpenSim
- Computational Analysis of Dynamical Systems
- Linear/Nonlinear Control Theory

EXPERIENCE

University of Southern California, Department of Biomedical Engineering
Los Angeles, CA

Teaching Assistant - BME 620L: Applied Electrophysiology
August 2019 - Present

- Coordinate weekly lab experiments designed to utilize concepts from biophysics to record physiological phenomena and to stimulate electrically-excitable tissue
- Utilize *Great Lakes NeuroTechnologies* BioRadios and BioCapture software to record and analyze electromyography, electroencephalography, and electrocardiography
- Lead weekly group discussions with 15 students to encourage proficiency in course concepts and lab techniques

University of Southern California, Division of Biokinesiology and Physical Therapy
Los Angeles, CA

Graduate Research Assistant
January 2016 - Present

- Examine and quantify the effects of physical and physiological constraints on the neural control of movement from a mathematical perspective
- Incorporate physiologically-reasonable neurological and mechanical parameters to construct complex models of limb movement
- Create Python and MATLAB scripts to either analyze or control complex, redundant, dynamical systems

4Front Technologies, LLC
Los Angeles, CA

BME Consultant
October 2018 - January 2019

- Research relevant physiology and basic engineering principles related to a novel electroceutical device
- Create collaborations between the company and prospective researchers to address specific project needs
- Provide sound mathematical and biomedical insight and advice on how best to proceed for product development/testing

PROJECTS

Quantifying the Error in Kinematically-Approximated Fascicle Lengths
Los Angeles, CA

Project Leader, First Author (*Publication In Review*)
August 2017 - Present

- Quantify the error from approximating fascicle lengths by the kinematics alone as a function of tendon tension and musculotendon geometry
- Conduct parameter sensitivity analysis to illustrate the need to include *muscle*- and *subject*-specific parameters in computational models of muscle
- Published an online toolkit with visualization software to allow researchers to quantify this error in the context of the specific experiment being conducted

Musculotendon Kinematics During a Basketball Free Throw
Los Angeles, CA

Project Leader, First Author
August 2015 - June 2017

- Co-authored MATLAB code that generated 100,000 random, feasible basketball free throws from clamped cubic spline algorithms and simplified movement mechanics
- Utilized posture-dependent moment arms to calculate musculotendon velocities and observe changes across different free throws
- Published an peer-reviewed article in the *Journal of Biomechanics* illustrating how kinematics changes affect neuromuscular requirements, even for similar-looking movements