Timothy Josephson

Personal Info

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504 Beacon St., Apt. 22,
Boston, MA 02115

Skills

Languages

MATLAB | Python | Julia | Java | Arduino

Software

ABAQUS | ANSYS | Creo | AutoCAD | Vicon Nexus | Fusion 360

Education

Sept 2020 – Present

Boston University, Boston, MA
Ph.D., Biomedical Engineering

Sept 2015 – June 2020

Drexel University, Philadelphia, PA
M.S., Mechanical Engineering
B.S., Mechanical Engineering
Minor in Materials Science and Engineering

Work and Research

Jan 2018 – June 2020

Drexel University, Philadelphia, PA
Researcher - Multiscale Computational Mechanics and Biomechanics Lab

- Used finite element damage models to study the microstructural fracture behavior of cortical bone
- Developed a histological procedure for microstructural imaging of human cortical bone
- Implemented machine learning, image processing, and statistical analysis techniques to relate simulated mechanical behavior to microstructural morphology

Apr 2019 – Sept 2019

DePuy Synthes - Johnson & Johnson, West Chester, PA
R&D Engineering Co-op - Trauma, Upper Extremities

- Developed designs and performed computational mechanical analysis on a new set of surgical implants
- Wrote engineering rationales and design verification documentation to prepare for product launches
- Patent application submitted for a screw-in-screw internal fixation device for distal radius fractures

Apr 2018 – Apr 2019

Thomas Jefferson University, Philadelphia, PA
Research Assistant - Daniel Baugh Institute for Functional Genomics/Computational Biology

- Developed and analyzed computational multiscale systems biology models of epidermal wound healing
- Employed linear algebra and differential equations techniques to develop, solve and analyze complex systems of differential equations in MATLAB and Python
- Manuscript under preparation for submission

Apr 2017 – Sept 2017

Applied Physics Lab - Johns Hopkins University, Laurel, MD
Biomechanics Co-op - Biomechanics and Injury Mitigation Systems

- Studied biomechanical injury dynamics using 3D motion capture technology
- Performed high-rate mechanical testing for material characterization using digital image correlation
- Developed a data management system and object-oriented MATLAB code to enable rapid analysis of data from hundreds of injury surrogate/crash test dummy experiments

Inventions & Projects

June 2019 Screw-in-Screw Internal Fracture Fixation Device – Patent Application Filed with DePuy Synthes

Ongoing Custom Finite Element – Topology Optimization Code

Publications

June 2020 [1] ***Josephson TO.*** *2020. A microstructural analysis of the mechanical behavior of cortical bone through histology and image processing. ProQuest Dissertations and Theses Global. (Accession No.28022452).*

In Progress [2] ***Josephson TO.****, Moore JP., Maghami E., Freeman T, Najafi AR. In Progress. Computational Study of the Mechanical Influence of Lacunae and Perilacunar Zones in Cortical Microcracking*

In Progress [3] *Moore JP.,* ***Josephson TO.****, Maghami E., Najafi AR. In Progress. Impact of Microcracks on Fracture Propagation of Cortical Bone Using Phase Field Method*

Honors & Awards

June 2020
- Graduated *Summa Cum Laude*, Drexel University

June 2020
- Graduated, Honors College, Drexel University

2016-2020
- Membership, *Pi Tau Sigma* - International Honor Society for Mechanical Engineers