# Cyrus Karimy

Tyngsborough, MA . cfkarimy@gmail.com . www.linkedin.com/in/cyrus-karimy . 978-512-0236

## Education

**Tufts University,** Medford, MA — Anticipated May 2024
*Master of Science,* **Biomedical Engineering** — GPA: 3.93

**University of Massachusetts Amherst,** Amherst, MA — May 2022
*Bachelor of Science*, **Biomedical Engineering** — Major GPA: 3.74
UMass Amherst Dean's List

**Relevant Coursework**
MATLAB in BME, Cellular Agriculture, Engineering Project Management, Tissue Engineering, Senior Design I & II, Systems Biology, Mechanical Analysis of Human Motion, Musculoskeletal Biomechanics, Biomaterials, Quantitative Physiology, Organic Chemistry I

## Research Experience

**Tufts University,** Boston, MA
***Nicole Tichenor Blackstone Lab, Graduate Research Assistant*** — September 2023 – Present

- Designing, testing, and optimizing serum-free media formulation for bovine cells using AI/Machine Learning Algorithms
- Applying Response Surface Methodology to design optimization experiments with growth factors and proteins
- Implementing data from optimization experiments into a predictive artificial neural network model, the model exhibiting the highest accuracy will be selected as the fitness function for optimization
- Employing various evolutionary algorithms, such as particle swarm optimization and genetic algorithm to further optimize the media formulations
- Present, publish, and release the optimal algorithm for media formulation discovery for the TUCCA consortium

**Tufts University,** Medford, MA — Fall 2022 - Present
***Kaplan Lab, Graduate Research Assistant***

- Designing and testing serum-reduced media formulations for tuna fish cells
- Analyzing the individual effects of supplemental media components with proliferation and cytotoxicity assays
- Determine the statistical significance of each supplement with Dunn's test on MATLAB
- Combine optimal supplements and observe long-term proliferation effects with Hoechst and F-actin staining
- Present and defend thesis research to the Tufts BME committee

**University of Massachusetts Amherst,** Amherst, MA
***Donahue Research Lab, Undergraduate Research Assistant*** — Winter 2020 – Spring 2022

- Analyze the composition, histology, and mechanical properties of bighorn sheep horn bones
- Utilize furnace to determine ash mass and dry mass to calculate Bone Mineral Content
- Apply histological staining methods to small sections of bone to assess and calculate bone porosity through BIOQUANT Osteo software
- Observe stained bone under a ZEISS microscope and analyze the presence of secondary osteons to identify consistent bone remodeling
- Design and operate fixtures that are incorporated into machines that aid with bone coupon formation

- Test bone coupons and correlate mechanical strength to composition and microstructure for biomechanical applications
- Aim to apply results into biomimicry techniques that will implement the bone's energy absorption characteristics for helmets to prevent brain damage from impacts

***Rotello Labs, Undergraduate Research Assistant*** Fall 2019 - Winter 2020

- Employed proteins as antimicrobial nano-bricks to create thin-film coatings on surfaces for improved biocompatibility and controlled drug delivery
- Developed protein solutions of various concentrations and pH levels for optimized drug delivery
- Disinfected silicon chips with ethanol and plasma ion cleaning in preparation for coating
- Operated a spin coating machine to apply protein onto chips
- Inspected, tested, and investigated for proper coatings on finalized chips for potential biomedical usage

## Work Experience

**Tufts University,** Medford, MA

***Graduate Teaching Assistant*** September 2023 - December 2023

- Lectured, graded assignments, and held office hours for a graduate-level course in the BME department, consisting of 40 PhD, Master's, and Undergraduate students

**University of Massachusetts Amherst,** Amherst, MA

***Undergraduate Teaching Assistant***: ***Statics & Dynamics, Biomechanics*** Fall 2020 – Spring 2021

- Assisted with developing exam rubrics and homework assignments
- Graded homework, quizzes, and exams and submitted grades to an online grade book

***Engineering Peer Mentor for UMass College of Engineering*** Fall 2018 – Spring 2020

- Led and communicated with freshmen in an Intro to Engineering seminar
- Presented seminar ideas to fellow engineer peers using Microsoft PowerPoint
- Created an all-inclusive environment for the college of engineering

**AMP Corp.,** Lowell, MA Summer Intern 2015 - 2020

- Manufactured and applied thin film coatings to medical devices to prevent bacteria growth
- Operated vacuum systems using mechanical and cryogenic pumps to deposit metals, oxides on substrates
- Used Perkin Elmer FTIR Frontier for testing and characterization of samples
- Shipped back the fully coated materials to the original medical device supplier

## Publications

Luca H. Fuller, **Kourosh F. Karimy**, Paige L. Ruschke, Meredith M. Taghon, Alfred J. Crosby, Seth W. Donahue, Structure-property relationships of velar bone tissue from the energy absorbing horncore of bighorn sheep rams, Acta Biomaterialia, 2023, ISSN 1742-7061, https://doi.org/10.1016/j.actbio.2023.05.013.

## Projects

***Wilson's Disease Research Project*** Winter 2022 – Spring 2022

- Investigating how Wilson's Disease impacts the liver such that copper cannot be filtered out
- Researching how the liver forms and heals, as well as its cell, tissue, and organ interactions
- Developing tissue engineering solutions through either tissue regeneration or filtration optimization
- Wrote a grant proposal with a potential solution by the end of the semester to professor

***Organoid Fusion Device*** Fall 2021 – Spring 2022

- Led and worked in a team with other biomedical engineering students in a team to develop a device that supports and enhances the organoid fusion process

- Collaborating with team members to 3D model and resin print prototypes and the final design
- Building and testing two major prototypes
    - First prototype will optimize the flow of cell media from one cultured well to another
    - Second prototype will optimize the fusion between cells once delivered effectively
- Presenting results with a demo at the end of the semester with the team

***Autonomous Smart Car*** Fall 2019

- Led and tested a small anti-collision smart car from scratch and tested its efficiency
- Constructed circuits on a breadboard and connected it to an ARDUINO programmed by the team
- Incorporated light and sonar sensors which allowed the car could move accordingly
- Avoided collisions from other smart cars at an end of semester smart car rally

---

## Leadership Roles and Activities

- Tufts Club Taekwondo Social Chair & Athlete
- Freshman Event Coordinator for College of Engineering
- Intramural Soccer Captain
- Biomedical Engineering Society Member
- Persian Student Organization Member

---

## Skills

- **Lab Equipment/Processes:** Mammalian Cell Culture, CyQuant Proliferation Assay, Protein Extraction, Celligo Microscope, Countess 3 Cell Counter, ISOMET, ECOMET, ZEISS Microscope, Spin coater, Furnace, Fume Hood, Staining, Bone Composition Analysis, 3-Point Bend Testing, Dynamic Mechanical Analysis Testing, Microscope Slide Production, Air Pressure Chamber, Thin Film Coating, Breadboard and Circuit Design
- **Software:** JMP, ARDUINO Programming, MATLAB, Java, Python, Microsoft Office, LTSpice, Pspice, LabView, and BIOQUANT Osteo
- **Languages:** Fluent in English and Farsi

---