Hsin Huei Chen

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Education

Cornell University *Expected May 2022*
B.S. Mechanical Engineering

Relevant Skills

Proficient in: Solidworks, Abaqus, AutoDesk Fusion 360, AutoDesk Inventor, MATLAB, ImageJ/Fiji, Igor Pro
Conversationally fluent in Mandarin

Honors and Awards

Summer Experience Grant Recipient Summer 2021
- Cornell stipend to fund research experience

Serve in Place Grant Summer 2021
- Cornell grant to fund summer service project, S.T.E.A.M. Bank

Engineering Learning Initiative Research Award Recipient Spring 2021
- Cornell award to support undergraduate research experiences

McMullen Scholar All semesters

Research Experience

Cornell University, Nelly Andarawis-Puri Lab **March 2020 – Present**
Undergraduate Research Assistant, Dr. Nelly Andarawis-Puri *Ithaca, NY*
- Developed extracellular matrix (ECM) strain device using Fusion 360 to study cell matrix interactions in tendon upon induced strain
- Analyzed tendon structural damage using second harmonic generation (SHG) images to assess how the timing of exercise initiated post-fatigue injury affects ECM repair
- Developed 3D collagen-based microtissue constructs to investigate cellular mechanisms involved in tendon healing

Massachusetts Institute of Technology, Therapeutic Technology Device & Development Lab **May 2021 – August 2021**
Undergraduate Research Assistant, Dr. Ellen Roche *Remote*
- Designed a programmable left ventricle expander device using SolidWorks to explore novel therapies in treating heart failure with preserved ejection fraction (HFpEF)
- Modelled and conducted stress and strain analysis on device using Abaqus to visualize how the device improves heart function

Yale Medicine Computational Neurophysiology Laboratory
Undergraduate Research Assistant, Dr. Hitten Zaveri *Remote*
- Drafted FDA documents to aid with the production of the NeuroProbe, a device that condenses data collection post traumatic brain injury into one probe, rather than dozens. **May 2021 – August 2021**
  - Drafted Design Inputs/Outputs documents and conducted FMEA (Failure Mode/Effects Analysis) on the device
- Programmed machine learning algorithms using MATLAB (random forest, bagged trees) to: **May 2020 – August 2020**
  - Analyze EEG data to classify signals as data or noise to more accurately predict/detect seizures and to find the distance of electrode to seizure onset area

Cornell Lab of Accelerator Sciences & Education **September 2019 – May 2021**
Undergraduate Research Assistant, Dr. Yulin Li *Ithaca, NY*
- Built void models (negative geometry) of gas pumps using AutoDesk Inventor to be used with MolFlow+ simulations
- Simulated gas flow through beam pump using MolFlow+ to predict how the pressure would change with pump variations

Kennesaw State University, Sooklal Lab **June 2019 – August 2019**
Undergraduate Research Assistant, Dr. Valmiki Sooklal *Marietta, GA*
- Simulated effects of laser irradiation on skin tissue using Solidworks to study how laser sutures change protein structures within tissue and to identify effective alternatives to normal sutures or staples.

Publications, Presentations, and Abstracts

1. Marvin JC, Liu EJ, Chatterjee M, **Chen HH**, & Andarawis-Puri N. "MRL/MpJ Tendon-Derived Provisional Extracellular Matrix and Secretome Combined Stimulate Canonical Healing Tendon Cells Toward Regenerative Healing." In Preparation

2. **Chen HH**, Marvin JC, & Andarawis-Puri N. *Designing a 3D Artificial Tendon Microtissue to Elucidate Cell-Matrix Interactions Underlying Scarless Tendon Healing.* Annual Cornell Undergraduate Research Board Fall Forum. Ithaca, NY, December 2021. Poster.
3. **Chen HH**, Rosalia L, Fan Y, Roche ET. *Finite Element Modelling of a Soft Robotic Sleeve to Enhance Diastolic Function for Heart Failure.* 2021 Annual Biomedical Engineering Society Meeting. Orlando, FL, October 2021. Poster.
4. Marvin JC, Liu EJ, **Chen HH**, Rebecca Bell, Andarawis-Puri N. *MRL/MpJ Tendon-Derived Extracellular Matrix and Secretome Modulate Canonical Healing Tendon Cells Toward Regenerative Behavior*. 29th European Orthopaedic Research Society Annual Meeting. Rome, Italy (Hybrid), September 2021. Podium.
5. Marvin JC, Liu EJ, **Chen HH**, Andarawis-Puri N. *MRL/MpJ Tendon-Derived Extracellular Matrix and Secretome Modulate Canonical Healing Tendon Cells Toward Regenerative Behavior*. 66th Orthopaedic Research Society Annual Meeting. Long Beach, CA (Virtual due to COVID-19 Pandemic), February 2021. Podium.
6. Bell R, Suri H, Maloney E, **Chen HH**, Andarawis-Puri N. *Post-Fatigue Injury Increase in Glycosaminoglycan Content is Associated with a Reparative Outcome from Subsequent Therapeutic Exercise*. 66th Orthopaedic Research Society Annual Meeting. Long Beach, CA (Virtual due to COVID-19 Pandemic), February 2021. Podium.

Professional Experience

Combat Robotics at Cornell **September 2021– Present**
Sportsman Mechanical Subteam *Ithaca, NY*

- Designed via Fusion 360
    - Motor mount: stabilizes a high torque motor of a flipper weapon on a 12 pound robot

Cornell Autonomous Sailboat Team **March 2020 – Present**
Mechanical Subteam *Ithaca, NY*

- Designed via Solidworks
    - LiDAR casing: Protects the boat's LiDAR sensor from varying water conditions, allows for XYZ while maintaining visibility.
    - Modular sail: 60% smaller than our normal sail to accommodate for a 5-8m/s wind speed, allowing our boat to be modular depending on varying wind conditions
- Machined and fabricated carbon steel sail counterweight and aluminum keel to aid in balancing the boat

Onboarding Lead

- Developed training programs for new members and overhauled outdated onboarding structure

Service

College Mentor for Kids **September 2019 – December 2019**

- Mentored elementary students in the Ithaca community to improve their self confidence and help guide their futures

Splash! at Cornell **November 2020, May 2021**

- Taught two courses (Chinese History: Mao Ze Dong and Fun Facts!) to over 60 kids in rural communities in Ithaca
- Moderated classes for peers to ensure they ran smoothly

CURIE Academy Program Assistant **July 2021**

- Encouraged and advised students participating in Cornell's CURIE Academy program, designed to provide an opportunity for high school girls to explore STEM

S.T.E.A.M. Bank **July 2021 – Present**

- An independently led project funded by Cornell's Serve In Place Grant
- Intended to create a video bank of college student experiences in STEAM as a resource for students in underserved communities in Greater Atlanta to explore what a STEAM education is like.

Guiding Eyes for the Blind **September 2021 – Present**

- Train and care for dogs to prepare them to become guiding eye dogs for the blind or vision impaired