

Seungyeon (Julia) Han

• Ann Arbor, MI

• www.linkedin.com/in/julia-seungyeon-han

• juliasyh@umich.edu

EDUCATION

University of Michigan

Doctor of Philosophy, Biomedical Engineering, Biomechanics Track

Ann Arbor, MI

Aug. 2023 - Present

3.86 / 4.00

Stony Brook University

Master of Science, Applied Mathematics and Statistics, Statistics Track

Stony Brook, NY

Aug. 2020 - May 2021

Stony Brook University

Bachelor of Science, Applied Mathematics and Statistics

Stony Brook, NY

Mar. 2016 - May 2020

Bachelor of Science, Mathematics

RESEARCH EXPERIENCE

Multi-scale Modeling of Hypertrophic Cardiomyopathy (HCM) Disease

Ann Arbor, MI

Graduate Student Research Assistant

Aug. 2023 – Present

- Integrate cellular-level data with MRI-based organ-scale assessments to elucidate the distinct structural and functional remodeling pathways induced by Mavacamten compared to traditional surgical interventions

Machine Learning in Cardiac Strain Curve, Columbia University

New York, NY

Research Assistant

Dec. 2021 – Apr. 2023

- Assist in developing automated algorithms of zero-crossing (ZC) location on incremental strain curves in the myocardium segmentation for each echocardiographic view and patient
- Optimize the ZC selection algorithm using logistic regression, support vector machine (SVM), and Random Forest

Automated Segmentation Using U-Net in Cardiovascular Images

New York, NY

Research Assistant

Dec. 2021 – Apr. 2023

- Implement U-Net convolutional neural networks to automate and improve cardiac B-mode ultrasound image segmentation performance

Cardiac Strain Imaging Artifact Detection Project, Columbia University

New York, NY

Research Assistant

Dec. 2021 - Oct. 2022

- Wrote codes to calculate the Intersection of Union (IoU) values to compare displacement estimation on strain images of healthy human subjects and coronary artery disease patients
- Assisted in applying Minimum Variance beamforming and Singular Value Decomposition (SVD) filtering to myocardial elastography data acquisitions

Cross-Species SARS-CoV-2 Genome Analysis Project

Stony Brook, NY

- Utilized Clustal Omega, PAL2NAL, MATLAB, and R to conduct

Feb. 2021 - May 2021

- multiple sequence and codon alignments of Spike proteins and Envelope proteins
- Collected nucleotide/protein sequences of coronaviruses from 30 different species through NCBI RefSeq genomes
- Demonstrated lower disparity and mutability of Envelope protein compared to Spike protein by comparing the nonsynonymous substitution and synonymous substitution ratios (dN/dS ratio)

Mahdavi Laboratory, Stony Brook University

Stony Brook, NY

Undergraduate Research Assistant

Dec. 2016 - May 2017

- Presented applications of stochastic algorithms in Biostatistics (survival analysis and Gaussian)
- Ran experimental analysis in R and Python to investigate hypothesis with public health data

PUBLICATIONS & CONFERENCE PRESENTATIONS

Multiscale Dissection of HCM: From iPSC-Derived Cardiomyocytes to Organ-Level Insights

Seungyeon Julia Han, Nathan French, et al, (2024)

Ann Arbor, MI

BMES 2024 Annual Meeting

Modulation of Cardiomyocyte Mechanics by HCM-Linked Mutation and Mavacamten

Seungyeon Julia Han, Nathan French, Minha Kim, et al, (2024)

Ann Arbor, MI

Myofilament Meeting

Electromechanical Wave Imaging for Pediatric Mitral Valve Disease Characterization

Melina Tourni, Seungyeon Julia Han, et al, (2023)

New York, NY

Computers in Biology and Medicine

Cardiac Strain Imaging Artifact Detection and Suppression with MV Beamforming and SVD Filtering

Jad El Harake, [...], Seungyeon Julia Han, et al (2022)

New York, NY

IEEE International Ultrasonics Symposium (IUS) Proceedings

Non-Invasive 3D Electromechanical Cycle Length Mapping for Atrial Flutter Characterization

Melina Tourni, [...], Seungyeon Julia Han, et al, (2022)

New York, NY

American Heart Association (AHA) Conference

Electromechanical Cycle Length Mapping for Atrial Arrhythmia Detection and Treatment

Melina Tourni, [...], Seungyeon Julia Han, et al, (2022)

New York, NY

IEEE International Ultrasonics Symposium (IUS)

HONORS / AWARDS

-
- | | |
|---|-------------|
| • Stony Brook University Dean's List, <i>Stony Brook University</i> | 2016 – 2020 |
| • Academic Excellence Scholarship, <i>Stony Brook University</i> | Jun. 2019 |
| • Academic Excellence Scholarship, <i>State University of New York, Korea</i> | Dec. 2018 |
| • Prime Minister Award, <i>Korea Ministry of SMEs (Small and Medium Enterprise)</i> | May 2018 |
| • Academic Excellence Scholarship, <i>State University of New York, Korea</i> | Dec. 2017 |
| • Best Project Award, <i>AI Personalized Cosmetic Corporate, EMei, Beijing</i> | Jun. 2017 |

TEACHING EXPERIENCE

Calculus with Applications

Stony Brook, NY

Recitation Lecturer, Department of Mathematics at Stony Brook University

Feb. 2019 - May 2019

- Led recitations every week, and presented mathematical concepts and problems with examples
- Provided feedback on coursework and homework during recitations and office hours

Probability and Statistics/Applied Linear Algebra (2 courses)

Stony Brook, NY

Teaching Assistant, Department of Statistics at Stony Brook University

Aug. 2018 - Dec. 2018

- Answered students' questions about Statistical Inference material in weekly office hours
- Graded all assignments, quizzes, and group projects regarding the statistical applications

WORK EXPERIENCE

Number Analytics LLC

New York, NY

Data Analyst

May 2021 - Dec. 2021

- Collected and analyzed health data from clients by using SQL, Python, SPSS, Excel, and R
- Took the role of developing statistical analysis charts, cleaning, transforming, sampling, and analyzing complex datasets to derive statistically significant scientific results with Tableau
- Initiated a self-led individual project to invent a chatbot algorithm to analyze customer complaints
- Proposed suggestions and collected reports from surveys to build more improved functions on web development such as adding diagrams using the ggplot2 package in R and implementing codebooks for variable description

World Federal United Nations Association (WFUNA)**New York, NY***Intern, College Leaders*

Jun. 2018 - Aug. 2018

- Transformed large clinical and healthcare datasets using R and Python to identify patterns and important variables for further analysis related to sustainable development goals
- Presented a group project to social entrepreneurs about the importance of statistical infographics

LEADERSHIP EXPERIENCE

SUNY Education Volunteer Club**Incheon, Korea***Club President, The State University of New York, Korea*

Jun. 2018 - Aug. 2019

- Organized weekly tutoring sessions for children raised in single-parent families
- Initiated and organized general body meetings to facilitate interaction between club members

Global Campus Ministry International Christian Club (ICC)**Incheon, Korea***Club President, The State University of New York, Korea*

Dec. 2017 - Jan. 2019

- Chaired important group meetings for better communication among members
- Structured club activities and events such as fundraising and prayer meetings

Residential College Program**Incheon, Korea***Resident Assistant, The State University of New York, Korea*

Jan. 2018 - Dec. 2018

- Coordinated and planned floor events as a student representative
- Promoted a sense of community by encouraging residents to get along together

COMMUNITY SERVICE / ACTIVITIES

Mathematics Teacher**New York, NY**

- Initiate free Mathematics tutoring to K-12 students through Zoom Aug. 2019 – Jan. 2021
- Taught Mathematics to elementary school students at General Social Welfare Center, Korea

Volunteer Abroad**Yanbian, China**

- Provided computing knowledge to Yanbian University of Science Jun. 2018 – Jul. 2018
- Connected the organization to the community by establishing rapport, coaching, and compliance