

AMIRALI MONZ

EDUCATION

Master of Science, Molecular Engineering

University Chicago

Sept 2024 – June 2025

Chicago, IL

- Bio-immunoengineering track

Bachelor of Science, Biomedical Engineering

University of Illinois at Chicago

Sept 2022 – May 2024

Chicago, IL

- Summa Cum Laude
- Dean's List: Achieved honors in every semester at UIC, graduating with a cumulative GPA of 3.96

Bachelor of Science, Biomedical Engineering

Northwestern University

Sept 2020 – June 2022

Evanston, IL

- Completed first two years of coursework in Honors Integrated Science Program, Biomedical Engineering

A Levels in math, biology, chemistry and physics

Westminster School

Sept 2018 – June 2020

London, UK

- Achieved 4 A* grades in A Levels

HONORS & AWARDS

2024	First Place in University of Chicago Communication Skills for Industry Program Presentation
2024	No.1 in Paper Competition, MISSAB 24 Conference Award: "Bleeding Point Detection in Spine Surgery"
2024	Ad Hoc Reviewer, Global Spine Journal, Sage Publications
2024	Provisional Patent #64/987,654. Title: "Machine Learning-Assisted Detection and Visualization of Bleeding Points During Endoscopic Spine Surgery"
2024	Bell Honors Award: For the top biomedical engineering student in the 2024 class with highest GPA.
2024	1st place Oral Presentation Competition, Biomedical Engineering Society Symposium, UIC, Chicago: "On Mathematical Modeling of Growth"
2023	Introductory Course on Microsurgery, University of Illinois Department of Surgery: Completed a 4-week course on microsurgical techniques
2022-2024	Honors College Research Scholarship, \$1200, University of Illinois: Recognized for significant research achievements with funding to present at national and international conferences
2022	Balanced Man Scholarship, \$5,000, Northwestern University: Awarded for exceptional contributions to the Northwestern community and student welfare initiatives
2021-2022	McCormick Research Grant, Northwestern University: Awarded \$5,500 in research funding per year for two years to continue research on Drosophila courtship behavior
2020-2022	Murphy Scholarship, \$5,500, Northwestern University: Selected as one of the top 8 engineering students for academic and research excellence
2019	Gold Medal, UK Chemistry Olympiad (UKChO); Gold Medal, British Biology Olympiad (BBO); Gold Medal, British Physics Olympiad (BPhO); Gold Medal, British Mathematics Olympiad (BMO)

RESEARCH AND GRANTS

Research Specialist & Data Analyst

PI: Amelia Bartholomew - UIC Department of Surgery - Research Themes: Surgical Education, Tissue Engineering

May 2024 – Ongoing Chicago, IL

Hypotheses tested:

- The 6-clicks phone app can enhance frequency of real time feedback for improved performance in the M3 surgical clerkship
- AI can be used to evaluate the quality of a microsurgical anastomosis in learners

Accomplishments:

- Developed a mobile application on IOS to facilitate feedback sought by M3 medical students by faculty during M3 Surgery clerkship
- Developed a method to measure linearity, suture depth, and alignment using image capture and ai-based algorithm analysis
- Developed an automated data analytics tool for large scale data sets using R

Clinical Lab Engineer

PI: Ankit Mehta - UIC Department of Neurosurgery - Research Theme: Spine Surgery

July 2023 – Ongoing Chicago, IL

Hypotheses tested:

- Machine learning assisted bleeding detection in endoscopic spine surgery can significantly reduce operation time
- The rate of spinal implant collapse is significantly impacted by the type of expansion of the implant

Accomplishments:

- Developed and patented a machine learning algorithm to pinpoint bleeding points during endoscopic spinal surgeries
- Spearheaded the creation of the lab website
- Led a team of 7 medical students in studying spinal cage subsidence post-TLIF surgery, contributing to ongoing surgical advancements
- Collaborated with Johnson & Johnson's DePuy Synthes HQ to refine the Velys Spinal Robot's functionality through FDA trials
- Designed and hosted an interactive exhibition at the Museum of Science and Industry, engaging the public in neurosurgery using cutting-edge tools

Research Assistant

PI: Alexander Shingleton - UIC Department of Biological Sciences - Research Theme: mathematical modeling of fruit fly growth

September 2022 – May 2024 Chicago, IL

Hypotheses tested:

- Drosophila's decision to cessate growth happens prior to critical mass

Accomplishments:

- Developed a mathematical model in SIMULINK to analyze Drosophila hormonal responses, employing advanced mathematical modeling
- Investigated growth cessation mechanisms in Drosophila, elucidating the hormonal interplay involved
- Co-authored a publication in *Proceedings of the National Academy of Sciences (PNAS)*, showcasing impactful research findings
- UIC Honors College Grant, \$500: "Excellent Dedication to Research", December 2023

Junior Research Assistant

PI: Ravi Allada - Northwestern Department of Neurobiology - research theme: fruit fly courtship behavior

Sept 2020 – July 2022 Evanston, IL

Hypotheses tested:

- Drosophila courtship behavior is significantly impacted by wavelength of light

Accomplishments:

- Created an AI algorithm to automate Drosophila behavioral analysis, reducing manual annotation time by 250%.

- Conducted precise microinjections to investigate gene expression effects on Drosophila development and behavior
- McCormick Research Grant, \$5,500: "A novel method of inducing memory loss in Drosophila", August 2021

PAPERS AND PRESENTATIONS

- **Monshizadeh A**, Mehta A, Zhang V, Reymundo A, Gil E. Novel method of measuring spinal cage collapse using artificial intelligence. In: *2024 University of Chicago Material Research Center Symposium*, Chicago, IL, 2024.
- **Monshizadeh A**, Mehta A, Zhang V, Reymundo A, Gil E. Subsidence of screw-based and non-screw-based expandable cages in transforaminal lumbar interbody fusion. Manuscript submitted to *CNS Neurosurgery*, 2024.
- **Monshizadeh A**, Sims T, Shimotake L, et al. Six clicks for immediate feedback on short tasks during the surgical clerkship. Abstract published in proceedings of the 111th Clinical Congress, 2024.
- **Monshizadeh A**, Sims T, Shimotake L, et al. Six clicks for immediate feedback on short tasks during the surgical clerkship. Presented at the Education 2 Session, 111th Clinical Congress, San Francisco, CA, October 21, 2024.
- **Monshizadeh A**, Mehta A, Elseweifi LNH, Gould A. Bleeding point detection algorithm for visualization during endoscopic spine surgery. Manuscript submitted to *CNS Neurosurgery*, 2024.
- **Monshizadeh A**, Mehta A. Bleeding point detection algorithm for visualization during endoscopic spine surgery. In: *2024 AO Foundation Conference*, Phoenix, AZ, 2024.
- Griego M, Carneiro A, **Monshizadeh A**, et al. The impact of a short microsurgery didactic on first- and second-year medical student suture skills and surgical career aspirations. Abstract submitted to *Association of Surgical Education*, 2024.
- **Monshizadeh A**, Shingleton A. Understanding critical size: A mathematical model of ecdysone dynamics in *Drosophila*. In: *Proceedings of the 65th Annual Society for Integrative and Comparative Biology Conference*, Seattle, WA, 2024.
- Tyson JJ, **Monshizadeh A**, Shvartsman SY, Shingleton AW. A dynamical model of growth and maturation in *Drosophila*. *Proceedings of the National Academy of Sciences*, vol. 120, no. 49, 2023. DOI: 10.1073/pnas.2313224120.

WORK AND VOLUNTEERING EXPERIENCE

Volunteer, STEM Club Teacher & STEM faculty

Children of Peace School

📅 Aug 2023 – Ongoing 📍 Chicago, IL

- Founded the school's STEM club to spark curiosity and engagement in science among elementary students
- Delivered weekly 4-hour sessions, integrating hands-on experiments and STEM-focused discussions

Medical Engineer

Clinical Immersion Program - UIC Biomedical Engineering

📅 July 2023 – September 2023 📍 Chicago, IL

- Identified inefficiencies in surgical procedures at University of Illinois Hospital, proposing actionable solutions to enhance clinical outcomes
- Innovated a device to reduce intraoperative bleeding during endoscopic surgery, saving 40 minutes per operation
- Authored a comprehensive report detailing key challenges and opportunities for improvement in clinical settings.

Volunteer, Surgical Center and Surgical Intensive Care Unit

University of Illinois Hospital, Surgical Center

📅 Sept 2022 – Ongoing 📍 Chicago, IL

- Contributed over 231 hours in surgical services and ICU settings, assisting with patient care and operational efficiency

Founder

Premier Edu.

📅 June 2020 – Ongoing 📍 London, UK

- Tutored over 300 students worldwide in STEM subjects, delivering 3,000+ hours of personalized learning
- Mentored students for international Math Olympiads and science competitions, while fostering critical thinking skills.

LEADERSHIP

2024	Graduate Student Council Elected Representative, University of Chicago: Elected by my peers to the graduate student council; work with the Dean of Students to enhance the learning experience
2024	Coordinator, University of Illinois Summer High School Apprenticeship Program (SHARP!): Faculty for the engineering curriculum; mentor for independent research projects in neurosurgery
2022-2024	Residential Hall Senator, University of Illinois: Advocated for the well-being of the residents of my building and served as a liaison between students and building management
2022-2024	Founder and President, University of Illinois Marksmanship Club: Raised over \$10,000 for the club and trained over 70 members in the safe handling of firearms
2020	President, Westminster Science Society: Organized weekly scientific talks by renowned scientists and practical science challenges for students
2019	Fellow, Global Citizens Initiative (GCI): GCI is 501(c)(3) non-profit organization aimed at empowering young global citizens from all sectors of society to be lifelong leaders of positive change. A 10-month fellowship in Tokyo focused on global service, where I was mentored to build a global service project to provide free tutoring to students worldwide

SKILLS AND LANGUAGES

- Teamwork: led biomedical engineering teams to produce innovative AI-based solutions in neurosurgery and microsurgical assessments
- Communication: Excellent written and verbal communication skills, with teaching experience and experience in oral presentations at national and international symposia
- Time-management: run a weekend tutoring business in China from 12am-7am every Friday, Saturday, Sunday while engaged in three part-time research positions and a full-time student
- Computer Programming Skills: MATLAB, R, C/C++, Python, LaTeX
- English and Persian: Native fluency

INTERESTS

National Competitions in Marksmanship (former member of UK National Team), Competitive Archery, Hiking and outdoors