

Mai Al Shaaban

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EDUCATION

Brandeis University

Jan. 2024 – May 2026

B.S. in Applied Mathematics and Computer Science

Waltham, MA

**Transferred from Southern Illinois University–Edwardsville (SIUE), Aug. 2022 – Dec. 2023*

Relevant Coursework: Algorithms, Big Data and Numerical Methods, Scientific Computing, Machine Learning (Including Deep Learning), Data Structures, Computer Systems, (Real & Fourier) Analysis, Probability.

RESEARCH EXPERIENCE

Research Assistant, Machine Learning in Computational Fluid Dynamics

Sept. 2025 – Present

Jackson State University, Texas A&M University, and University of Texas at Arlington

Remote

- Collaborative work with faculty across three institutions on machine learning methods for computational fluid dynamics (CFD).

Senior Honors Thesis, Computational Neuroscience

Sept. 2025 – Present

Brandeis University, Department of Mathematics & Volen National Center for Complex Systems

Waltham, MA

- Modeling basal ganglia transitions from goal-directed to habitual learning using behavioral data from mice, with differential-equation–based approaches to capture dopamine-dependent striatal dynamics.

Research Student, Undergraduate Mathematics Research at Yale (SUMRY)

June 2025 – August 2025

Yale University, Department of Mathematics

New Haven, CT

- Selected as one of 19 students (10 non-Yale) to participate in this highly competitive research program.
- Appointed **Evaluation Chair** to represent students and provide feedback on program as a whole at the end.
- Led daily research discussions for the Machine Learning in Computational Fluid Dynamics (CDF) group of 4.
- Developed a complete pipeline from scratch to preprocess and analyze complex CFD simulation data, identifying vortex structures and extracting features for modeling.
- Applied methods (POD, NMF) to reduce dimensionality and uncover patterns in high-dimensional data.
- Designed deep learning transformers-based models to predict time series of fluid flow features from simulation metadata; Integrating learned models with Navier–Stokes solvers to speed up simulations while preserving physical consistency and accuracy.
- Led two Community Seminars throughout the program: *Women in Mathematics & Forbidden Mathematics*
- Presenting findings in multiple conferences: *Jane Street NYC Math Day, Yale and Williams College Math Programs Combined Conference and Young Mathematicians Conference.*
- Recruited to collaborate with CFD research groups at Jackson State University, Texas A&M, and the University of Texas at Arlington.

Research Assistant

Feb 2024 – April 2024

Brandeis University Guided Reading Research Program (GRP)

Waltham, MA

- Collaborated with a fellow undergraduate student and a PhD scholar to study Clifford Algebra concepts.
- Participated in weekly meetings to discuss abstract algebra topics and track research progress.
- Developed skills in communicating mathematical concepts through discussions and a final presentation to members of the Math department.

Undergraduate Research Assistant

Jan 2023 – Dec 2023

Southern Illinois University Edwardsville (SIUE) School of Business

Edwardsville, IL

Undergraduate Research and Creative Activities (URCA) Program

- **Evaluating Pension Plan Performance in Missouri and Illinois:**
 - * Conducted research on pension plans with a professor in the Economic and Finance department.
 - * Collected and analyzed data, identifying the 5 best/worst plans based on 20-year investment returns.
- **Research on Personifying Alexa and AI Code Effectiveness:**
 - * Worked with a professor in the Computer Management and Information Systems department.
 - * Researched Alexa personification's impact on reviews; Scripted data from local and global seller websites (BestBuy, Amazon, ASDA, Tesco, FlipKart).
 - * Contributed to a project on AI code effectiveness on GitHub with another department professor.

PUBLICATIONS

1. Yong Yang, Caixia Chen, Yonghua Yan, **Mai Al Shaaban** *Computational Analysis of Two Micro-Vortex Generator Configurations for Supersonic Boundary Layer Flow Control*. Journals, Processes, vol. 13, no. 9, 10.3390/pr13092818, 2025. DOI

CONFERENCES & PRESENTATIONS

Young Mathematicians Conference (YMC), Talk <i>The Ohio State University</i> <ul style="list-style-type: none">• <i>Estimating Flows of Partial Differential Equations using Time-Series Analysis.</i>	Aug. 2025 Columbus, OH
Jane Street NYC Math Day, Poster <i>Jane Street</i> <ul style="list-style-type: none">• <i>Machine Learning-Based Vortex Evolution in 3D High-Speed Flows.</i>	July 2025 New York, NY
Yale & Williams Math Programs Combined Mini Conference — Talk <i>Yale University</i> <ul style="list-style-type: none">• <i>Estimating Flows of Partial Differential Equations using Time-Series Analysis.</i>	Aug. 2025 New Haven, CT
SUMRY Community Seminars, Organizer/Speaker <i>Yale University</i> <ul style="list-style-type: none">• <i>Women in Mathematics.</i>• <i>Forbidden Mathematics.</i>	Jun.–Aug. 2025 New Haven, CT
Brandeis Mathematics Guided Reading Program, Talk <i>Brandeis University</i> <ul style="list-style-type: none">• <i>Clifford Algebra Overview.</i> Program Website	Apr. 2024 Waltham, MA
AI-Powered Women Conference <i>Massachusetts Institute of Technology (MIT)</i> <ul style="list-style-type: none">• Attendee. Conference Website	Sep. 2025 Cambridge, MA
The 33rd Annual Technology Conference <i>Harvard Business School</i> <ul style="list-style-type: none">• Attendee. Conference Website	Apr. 2025 Cambridge, MA
National Collegiate Honors Council (NCHC) Annual Conference <i>NCHC</i> <ul style="list-style-type: none">• Attendee. Conference Website	Nov. 2023 Chicago, IL
Central States Communication Association (CSCA) Conference <i>CSCA</i> <ul style="list-style-type: none">• Paper Presenter: "The Fantasy of Small World" Conference Website	Apr. 2023 St. Louis, MO

TEACHING EXPERIENCE

Teaching Assistant (Fundamentals of Computer Systems (aka Operating Systems)) <i>Brandeis Michtom School of Computer Science</i> <ul style="list-style-type: none">• Design and co-lead bi-weekly recitations and host weekly hours to support students in this challenging course.• Coordinate grading of programming assignments, accounting for 40–50% of course grades.• Provide structured feedback to the course instructor through regular meetings on student progress.	August 2025 – Present Waltham, MA
Teaching Assistant (Advanced Programming Techniques in Java) <i>Brandeis Michtom School of Computer Science</i> <ul style="list-style-type: none">• Sole TA selected to support the course alongside the instructor, providing comprehensive student assistance.• Hosted weekly 5-7 virtual Office hours to help students with the materials.• Graded programming assignments, contributing 40% - 50% of the students' course grades.• Contributed in grading students final oral exam• Met regularly with the course instructor to align on expectations and share feedback from a TA's perspective.	July 2025 – Aug 2025 Remote
Teaching Assistant (aka Enrichment Sessions Leader) <i>SIUE Department of Mathematics and Statistics</i> <ul style="list-style-type: none">• Led 2 weekly sessions for Calculus I students, testing their understanding of materials in groups.• Graded worksheets, contributing 10% - 15% to students' course grades on a weekly basis.• Collaborated with faculty and the enrichment sessions coordinator to align sessions with the curriculum.	Aug 2023 – Dec 2023 Edwardsville, IL

PROFESSIONAL EXPERIENCE

Data Science Intern

May 2024 – Dec 2024

Juvena Therapeutics

Remote

- Documented data preparation processes to enable optimal analysis and visualization, performing data collection, preprocessing, cleaning, and integration across 10+ in-house and public databases for 3 major company research projects on disease studies.
- Generated actionable insights for biologists and pharmacists by applying statistical modeling, clustering, and exploratory data analysis with optimized visualization tools, contributing to research on 3 diseases.
- Improved team alignment and project visibility by providing weekly updates to the supervisor, presenting bi-monthly to the data science team, and delivering a final summary presentation to the company.

Data Scientist

Jan 2025 – May 2025

Brandeis University Branda App Development Team

Waltham, MA

- Worked with a fellow to integrate transportation data from WhatEvent and MBTA into the Branda app, using machine learning to enhance real-time transit recommendations.
- Presented findings to the team and supported development by translating data insights into improved app features.

Inter-library Loan Student Supervisor (Previously Assistant)

Jan. 2024 – Present

Brandeis Goldfarb Library

Waltham, MA

- Promoted at the start of Fall 2025 to serve as Student Supervisor in the Inter-library Loan office.
- Process hundreds of lending and borrowing requests between Brandeis and partner universities across the U.S.
- Handle high-volume digital requests for specific articles/book chapters, ensuring timely delivery to faculty/students.

Resident Assistant

March 2023 – Dec 2023

SIUE Housing

Edwardsville, IL

- Fostered a safe environment, conducted mediation sessions, and enforced policies while supporting 37 residents in the first semester (2 buildings) and 64 residents in the second semester (3 buildings).
- Collaborated with RAs, pro-staff, and faculty for events, and attended a weekly class on leadership and interpersonal skills.

SERVICE, LEADERSHIP & MENTORSHIP

Student Union Executive Board Member

Head Treasurer (Current) & Deputy Treasurer (Former)

Jan. 2024 – Present

Brandeis University Student Union (SU)

Waltham, MA

- Selected to serve as Co-Head Treasurer for the 2025–2026 academic year, co-overseeing financial operations for approximately 200 student clubs, co-managing SU finances, and co-leading the SU treasurers team of 12.
- Processed over 240 club payments across three semesters and coordinated with the university budget office.
- Monitor budget progress and provide financial reports through regular meetings with the budget analyst.
- Represent the treasury at Student Union retreats and meetings.
- Conduct training sessions for club treasurers on financial procedures.
- Lead semester-end budget reconciliation for all clubs.

Vice President (Now) & Event Coordinator (Previously)

Jan. 2025 – Present

Girls Who Code (GWC) Brandeis Chapter

Waltham, MA

- Elected to serve as Vice President for the 2025–2026 academic year.
- Preparing for the 1st conference at Brandeis organized by a students' club on Sep. 13th, 2025.
- Organized GWC Galentine's Day event (featured in the Student Engagement February 2025 Newsletter).
- Planned, coordinated, and executed events, collaborating with internal clubs while ensuring requirements are met, managed timelines, and handled last-minute changes.

Undergraduate Departmental Representative

2025–2026 Academic Year

Brandeis University, Department of Mathematics

Waltham, MA

- Selected to represent undergraduates in departmental discussions on curriculum and community activities.
- Organize events, seminars, faculty talks, and information sessions on diverse mathematical topics.
- Collaborate closely with 2 peer UDRs and faculty/staff to strengthen community connections.

Mentor

Feb 2025 – April 2025

Brandeis University Department of Mathematics

Waltham, MA

- Mentored 5 students weekly in 50-minute sessions, advising on math majors, courses, and career opportunities.
- Helped students pick degree paths and find summer jobs, internships, and other university programs.
- Used my experience to guide students in their academics and career plans as a Math Department mentor.
- Led talks on math degree options helping students match their goals with available courses and resources.

Team Lead (Now) & Mentor (Previously)

May 2023 – Present

Syrian Youth Empowerment (SYE)

Remote

- Mentored 3 students through the one-year program, providing 1:1 guidance on college admissions, and typically mentor 2 new students annually each cycle.
- Organize weekly/bi-weekly meetings to track progress, ensure deadlines were met, and assist with application submissions. Along with monitoring important dates and setting reminders.
- Promoted to Team Lead to supervise a group of mentors and mentees and support their overall progress.

HONORS AND AWARDS

- Math Mentor Award (Spring 2025).
- Bertha A. Sigilman Endowed Scholarship (2024 - 2025 academic year).
- Student Leader Prize - Awarded for supporting SU treasury and club finances (Spring & Fall 2024, Spring 2025).
- Dean's List Scholar(Fall 2022, Spring & Fall 2023, Spring 2024, Spring 2025).
- AMY Fund Scholar - Recognized for academic excellence and community involvement (2023).
- Recognized twice with a prize for involvement in SIUE Undergraduate Research program (URCA) (2023).
- Selected as one of only 5 SIUE student representatives at the National Honors College Honors NHCH Conference in Chicago (2023).
- Member and President of The National Society of Collegiate Scholars (NSCS) SIUE Chapter (2023).
- Honored with a certificate for presenting a paper in the Central States Communication Association (CSCA) Undergraduate Honors Research Conference (2022).

TECHNICAL SKILLS AND LANGUAGES

Programming Languages: Java, Python, C/C++, JavaScript, R, MATLAB, LaTeX

Libraries: pandas, NumPy, SciPy, Matplotlib, scikit-learn, TensorFlow, Keras, PyTorch, Seaborn

Developer Tools: Google Cloud Platform, VS Code, Visual Studio, PyCharm, Eclipse, Paraview

Other Technical Tools: Workday, Latte, Moodle, Google Suite (Slides, Docs, Sheets, Calendar), Canva, Calendly

Spoken Languages: Arabic (Native), French (Upper-Intermediate)