

Mennatallah Asaad Gouda

<i>EDUCATION</i>	<p>Utah State University Mathematical Biology Master of Science Program 2021 – 2023 Academic courses: Mathematical modelling in biology, Numerical methods for Partial Differential Equations (PDEs), Methods of applied mathematics, Statistical bioinformatics, Advanced PDEs, & Analysis II.</p> <p>University of Science and Technology – Zewail City Computational Biology Bachelor of Science Program 2017 – 2021 Chosen academic courses: Calculus II, & III, Linear algebra, Biostatistics, Numerical analysis, Discrete mathematics, Ordinary differential equations, Systems biology, Data science, Algorithms for computational biology, Data structures, & Bioinformatics.</p>
<i>SKILLS</i>	<p>General: Academic writing & Presentation Programming languages: Python, C++, R, & MATLAB Laboratory: General cell biology, microbiology, and biochemistry including: DNA isolation, PCR, PAGE, Protein extraction, Cell culture, Bacteriophage isolation, & Liver function tests.</p>
<i>RESEARCH EXPERIENCE</i>	<p>Research Assistant - Infectious Diseases Modelling Department of Mathematics and Statistics – Utah State University May 2022 – present Under the supervision of Dr. Jim Powell, I have been characterizing the long-distance dispersal kernel of white-tailed deer yearlings using a 2D diffusion-settling PDE model. Moreover, I have also quantified the effect of these dispersal events on chronic wasting disease spatial transmission in Wisconsin using an integro-difference equation model. This research work has been funded by the US Geological Survey.</p> <p>Research Fellow - Ecology Modelling Rocky Mountain Mathematics Consortium June 2022 Under the supervision of Dr. Jennifer Forbey, I have implemented a prey-predator model to predict the population dynamics of voles and weasels in Norway and simulate the effects of environmental factors such as diet, season, and altitude on their population rates of change under the umbrella of the Genomics Underlying Toxin Tolerance project funded by National Science Foundation.</p> <p>Undergraduate Researcher – Cell biology Modelling Biomedical Sciences Department – Zewail City January 2021 – July 2021 Under the supervision of Dr. Fared Aboulela, I have modelled the effect of hydrogen peroxide preconditioning on Bone Marrow Mesenchymal Stem Cell migration in scratch assay using Keller-Segel chemotactic model and Forward Finite Difference method in Mathematica. The wet lab work was supported by the Center for Stem cell Excellence at Zewail City.</p> <p>Junior Research Assistant – Cancer Diagnosis using Omics Center for Genomics – Zewail City July 2020 – December 2020 I have reviewed DEGSeq, PenDA, an Ensemble learner, and RankComp in R/python using RNA-Seq data to help develop a novel workflow that classifies cancer samples with high accuracy for precision medicine.</p>
<i>TEACHING EXPERIENCE</i>	<p>Teaching Assistant Department of Mathematics and Statistics – Utah State University August 2021 – December 2022 I have been giving recitation sections for the college algebra class with very good instructor evaluations.</p>
<i>TRAININGS</i>	<p>Particle Swarm Optimization National Institute for Standards – Giza, Egypt November 2020</p>

I have learned how to derive the fractional-order form of the PSO method and implement it in MATLAB to optimize a variety of problems.

*EXTRA
EXPERIENCE*

- Analysing the experimental-design of the study titled: Danuglipron (PF-06882961) in type 2 diabetes: a randomized, placebo-controlled, multiple ascending-dose phase 1 trial
- Multivariate Analysis of Variance (MANOVA) of efficacy in a cholesterol drug clinical trial
- Modelling HIV infection effect on CD4⁺ T-cell depletion rate with ordinary differential equations
- Simulating the Lotka-Volterra predator-prey model along with steady state analysis
- Modelling bone remodeling in 3D with a variable order system of differential equations
- Modelling face recognition with principal component analysis
- Evaluating the two-break sorting problem solution compared to the greedy sorting algorithm
- Constructing minimum spanning trees with Kruskal's and Prim's algorithms
- Analysing cytometry data statistically with self-organizing maps
- Clustering protein-ligand interactions with the ordering points to identify the clustering structure algorithm
- Single nucleotide polymorphisms relevance learning in in type II diabetes with RF-SVM and RF-kNN models
- Fitting a COVID time series dataset with a logistic regression model

*PROFESSIONAL
ACTIVITIES*

Vice President of Society for Industrial and Applied Mathematics

Utah State University

September 2022 – till now

I am helping organize applied math events for graduate students including a graduate applications panel and participating in USU science week 2022.

Speaker at the American Mathematical Society

Utah State University

November 2022

I gave a short talk on introduction to fractional calculus at the "Luminous Talks" event of American Mathematical Society student chapter of Utah State University.

Chairperson of IEEE Women In Engineering

University of Science and Technology – Zewail City

July – September 2020

I built a team of 30+ members and launched a free online event during COVID. We reached out about 110 participants with 8 reputable speakers giving talks about empowering girls to get into engineering.

Head of Operations of Zewail City's Science Festival

University of Science and Technology – Zewail City

June – August 2019

I was responsible for managing 480 attendees/day for 4 days in a row. I headed three teams and supervised catering, transportation, rooms and lounges, day flow, ushering, and tour guiding.

*OTHER
SERVICE*

Volunteer

Logan Islamic Center

Jan 2022 – present

I am teaching muslim children Arabic language, Quran, and Islamic studies in the Sunday school.

Chairperson of Student Judicial Board

University of Science and Technology – Zewail City

April – October 2019

I headed the team of judges, and we were responsible for keeping the academic and ethical integrity among students, regulating student union elections, receiving complaints, and resolving conflicts.

Volunteer

Children's Cancer Hospital 57357

January 2018 – present

I am a family support member in the hospital's volunteer section. I lead some tour visits to the hospital and working on a proposal for developing the volunteering system.