Michael Luo

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Education

2021– **Ph.D Mathematical Sciences**, *New Jersey Institute of Technology*, Newark, NJ
Grade: 3.91/4.00

2017–2021 **B.S. Mathematics**, *The College of New Jersey*, Ewing, NJ
Grade: 4.00/4.00, Phi Beta Kappa, Most Outstanding Mathematics Student

Publications

[1] N. Panchy, C. Azeredo-Tseng, **M. Luo**, N. Randall, and T. Hong. Integrative transcriptomic analysis reveals a multiphasic epithelial–mesenchymal spectrum in cancer and non-tumorigenic cells. 9:1479, 2020. `https://www.frontiersin.org/articles/10.3389/fonc.2019.01479/full`.

[2] **M. Luo**, J. Gevertz, and E. Nikolopoulou. From fitting the average to fitting the individual: A cautionary tale for mathematical modelers. 12:793908, 2022. `https://www.frontiersin.org/articles/10.3389/fonc.2022.793908/full`.

[3] A. Zhu, J. Mahajan, M. Oydanich, **M**. Luo, and A.Khouri. *Analysis of Google Trends and Search Results of Ophthalmic Symptoms of Monkeypox*. Cornea, 2022 (Under Review).

Experience

1/19–5/21 **Research Assistant**, *The College of New Jersey*, Ewing, NJ
- Implemented a mathematical model in **Python** of tumor growth using nonlinear regression
- Model parameters were used to suggest immunotherapeutic drug dosing strategies
- Cross-validated against independent optimization method and established a set of best practices when using mathematics to suggest treatment protocols using **R** and **MATLAB**

6/20–8/20 **Research Intern**, *Memorial Sloan Kettering Cancer Center*, New York, NY
- Created model using (**Python**) to quantify fitness levels in immuno-therapeutic networks
- Utilized ϕ-evo software package to simulate molecular networks
- Attended weekly journal clubs and lab meetings to discuss novel findings in cancer research
- Member of Computational Biology Summer Program ($\sim$4% acceptance rate)

6/19–7/19 **Research Intern**, *National Institute of Math and Bio Synthesis*, Knoxville, TN
- Implemented Metropolis-Hastings algorithm in **Python** using **NumPy** and **Matplotlib** libraries that predicted epithelial gene expression in different cancer samples
- Clustered 2873 cancer samples in **R** based on epithelial gene expression into 3 primary subclusters
- Optimized ordinary differential equation model and generated parameter sets using PyMC3 package

6/18–7/18 **Research Intern**, *STEP-UP Research Program*, Ewing, NJ
- Researched teaching methodologies for high-school and undergraduate physics students
- Provided physics demonstrations for K-12 students in Trenton area

Presentations

May 2022 **New Jersey Institute of Technology**, *"Modeling action potentials in diurnal rodent species"*

May 2021 **The College of New Jersey**, *"Using Nonlinear Mixed Effects to Optimize a Model of Immunotherapy-Treated Murine Melanoma"*

Aug 2020 **Memorial Sloan Kettering Institute**, *"Quantifying fitness levels in evolving immune response networks"*

Nov 2019 **National Institute of Mathematical and Biological Synthesis**, *"Modeling Epithelial Gene Expression in Cell Differentiation"*

Jul 2019 **University of Tennessee Knoxville**, *"Modeling Epithelial Gene Expression in Cell Differentiation"*

May 2019 **The College of New Jersey**, *"Mathematical Models of Tumor Growth"*

Awards and Scholarships

May 2021 **Wendell B. Secor Award**

May 2020 **Robert N. Duncan Memorial Scholarship**

May 2019 **Carl N. Shuster Award**

May 2018 **Viola Bentz Hirsch Scholarship**

Jun 2017 **Bausch and Lomb Honorary Science Award**

Teaching History

2021– **Teaching Assistant**, *Calculus I, Calculus II, MATLAB/Differential Equations*

2020– **Tutor**, *GRE Math, SAT Math, AP Calculus, AP Physics*

Community Outreach

2022 **Research Mentor**, *New Jersey Institute of Technology*, Newark, NJ
Served as a research mentor for community college students participating in research at NJIT

2018–2021 **Emergency Care Ambassador**, *Princeton Medical Center*, Princeton, NJ
Assisted physicians, nurses, and patients in emergency department

2017–2019 **Community Service Coordinator**, *Young Scholars' Institute*, Trenton, NJ
Providing tutoring and mentorship for underprivileged students in Trenton area

Languages and Skills

Languages English, Chinese, Spanish

Programming Python, MATLAB, R

Libraries/Tools Matplotlib, NumPy, scikit-learn, Jupyter Notebook, Excel, LaTeX

Relevant Coursework

- Linear Algebra
- Machine Learning
- Advanced Differential Equations
- Advanced Computational Neuroscience
- Numerical Methods
- Advanced Applied Math Modeling