

Michael Cortes

865 Broadway Ave, Apt 85A • Holbrook, NY 11741 • (631) 896 – 4246 • michaelgcortes@gmail.com

Education

Stony Brook University	Stony Brook, New York
PhD in Applied Math and Stats (Computational Biology). GPA: 3.96	Current
MS in Applied Math and Stats (Computational Biology). GPA: 3.96	11/2016
BS in Physics (minor mathematics). GPA: 3.83	05/2013
Academic Honors: Magna Cum Laude, Dean's List every semester, Elected to Golden Key Honor Society.	

Quantitative / Computational Skills

Programming skills

Python, C++, MATLAB. Experience with parallel computing in each. MS Word, PowerPoint, and Excel.

Machine learning skills

Neural networks, k-means, principal component analysis, experience dealing with unstructured data and making predictions from large data sets.

Mathematical skills

Differential equations (deterministic and stochastic), stochastic simulations (Monte-Carlo), agent-based modeling, probability theory, optimization algorithms (gradient descent algorithms, downhill-simplex algorithms, genetic algorithms, swarm methods), regression (linear and nonlinear), experience developing models to gain insights and make predictions.

Scientific Projects

Protein secondary structure classification from primary structure

Culled and processed $\approx 150,000$ protein sequences from Protein Data Bank. Performed data analysis to learn important predictive features of sequences. Used features as input to neural network to classify sequences with greater than 98% accuracy. Also developed custom scoring functions to classify sequences with $\approx 80\%$ accuracy.

Predicting and understanding viral decision-making by modeling stochastic gene regulatory networks

Developed simple and complex computational models of the bacteriophage lambda gene regulatory network to predict outcome of viral infection and to understand how the infection depends on various biologically relevant variables. Optimized models with experimental data using various optimization algorithms.

Work Experience

Research Assistant (Laufer Center for Physical and Quantitative Biology, Stony Brook University)	05/2016 – Present
Collaborate with biologists to build and validate complex computational / mathematical models of biological decision-making. Write scientific papers, assist with grant writing, and give regular presentations of research progress.	
Adjunct Instructor (Department of Applied Mathematics and Statistics, Stony Brook University)	2017
Instructor for Calculus I at Stony Brook University. Prepared lectures, homeworks and exams.	
Instructor (Collegiate Science and Technology Entry Program (CSTEP), Stony Brook University)	2015, 2016
Instructor for Calculus I at Stony Brook University. Prepared lectures, homeworks and exams.	
Teaching Assistant (Stony Brook University)	08/2014 – 05/2017
Assisted in teaching undergraduate Calculus II class of 260 students and graduate level course titled Physical and Quantitative Biology. Drafted and graded homeworks and examinations.	

Publications and Accomplishments

Publication: Late-arriving signals contribute less to cell fate decisions.	2017
Published in Biophysical Journal. Built and optimized models of viral decision-making to predict effect of delayed infections. Predictions confirmed with experiments.	
Actuarial Exam P1 Probability Theory	2013
Emergency medical technician certification	2013

Competitive Academic Fellowships and Awards

Turner Fellowship Award (\$27,145 per year)	08/2014 – 09/2016
Diversity Supplement Grant (\$34,000 per year)	09/2016 – Present
Turner Summer Research Grant (\$3,500 per term)	2016, 2017
Academic Achievement Scholarship (\$5,000 per year)	08/2008 – 05/2010