

XINYU LI

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EDUCATION

New York University Shanghai, Shanghai, China

09/2016-present (Expected 05/2020)

New York University, New York, United States

09/2018-08/2019

Bachelor of Science, Major in Honors Mathematics, Minor in Data Science

Honors Mathematics Major GPA: 3.943, Cumulative GPA: 3.844

Highlighted Coursework: *Applied Stochastic Analysis (PhD level)*, *Monte Carlo Method (PhD level)*, *Optimization (graduate)*, *Probability Limit Theorem (graduate)*, *Scientific Computing (graduate)*

RESEARCH EXPERIENCE

Stochastic-Optimization-Based Stochastic Optimal Control

05/2019-09/2019

Advisor: Prof. Jonathan Goodman, Courant Institute of Mathematical Sciences (CIMS)

- Built a test model based on Ornstein-Uhlenbeck process, applied and Linear Quadratic Gaussian (LQG) regulator on a linear model and compared results to those yielded by Stochastic Gradient Descent algorithm
- Studied Princeton's graduate course *Optimal Control and Estimation*; Derived equations of the LQG control in steady state of the system; solved for the theoretical solution of the LQG problem by applying deterministic optimization methods; Applied Dynamic Programming approach to conducting LQG to verify the results
- Built a nonlinear ODE model with noise as a combination of Minimal Glucose Model and Pharmacokinetics Insulin dynamics with insulin injection and meal disturbance for Type 1 diabetes patients (T1D)
- Conducted a literature review on effective glucose control on T1D and parameter estimation strategies
- Implemented filter and stochastic optimization methods, and proposed improvements on control strategy
- Summarized the programs and drafted a report in collaboration with another student at CIMS
- Presented at NYU Courant Summer Undergraduate Research Experience symposium

Effects of Nutrient Depletion on Tissue Growth in a Tissue-Engineering Scaffold Pore

05/2019-09/2019

Advisor: Prof. Pejman Sanaei, Courant Institute of Mathematical Sciences (CIMS)

- Solved Stoke's equation subject to no-slip and no penetration boundary conditions and advection-diffusion equation in cylindrical coordinates for nutrient concentration PDE using asymptotical analysis
- Built a model for cell proliferation in a tissue engineering scaffold pore and simulated the process with quasi-static analysis; Created a reverse process model to find out the optimal geometry of the scaffold given a specific restriction on tissue shape
- Drafted a paper *Cell proliferation in a tissue engineering scaffold pore, and the effects of nutrient concentration and scaffold internal geometry* in collaboration with another student at CIMS
- Presented at International Congress on Industrial and Applied Mathematics 2019
- Presented at [72nd Annual meeting of American Physics Society](#)

FFT-based Modeling of the Coupling Behaviors of Composite Materials

11/2017-05/2018

Advisor: Prof. Romain Corcolle, NYU Shanghai

- Developed a model based on the Fast Fourier Transform (FFT) describing the homogeneous response of composite materials such as piezoelectric and magneto-strictive materials
- Constructed an effective property matrix considering coupled behaviors, and calculated the corresponding Green's operator in Fourier space, wrote an FFT-based coupling algorithm and ran simulations
- Compared the results with uncoupled algorithm and Finite Element Method
- Presented at NYU Shanghai DURF symposium

COMPETITION AND AWARDS

- Zhang Xiaoqi & Cheung Kwok Ching Global Future Scholar 2018-2020
- NYU Shanghai Recognition Award with scholarship 2018-2020
- [NYU Courant Summer Undergraduate Research Fund](#) 05/2019
- Meritorious Winner of Mathematical Contest in Modelling (top 9%) 03/2019
- [NYU Shanghai Deans' Undergraduate Research Fund](#) 05/2018
- Dean's List of Honors 2016-2019
- Champion of Shanghai Schools Football League with NYU Shanghai women's soccer team 2018

TEACHING EXPERIENCE

Multivariable Calculus (Learning assistant); Intro to Computer Programming (Learning assistant); Po-Shen Loh's Olympiad math class (Class teacher)

SKILLS

English: TOFEL: 109 (Reading 27+Listening 27+Speaking 25+Writing 27),

GRE: 331 (Verbal 163 (93%) + Quantitative 168 (93%) AW 3.5);

Programming Language: Python, MATLAB, Java