

Qiuyang Wang

🌐 <https://qiuyoungwang.github.io/> ✉ qw2319@columbia.edu ☎ +1 6465150054

EDUCATION

M.S. in Applied Math **Columbia University in the city of New York, U.S.** 2021.9-2023.5

· **Math:** Differentiable Manifolds (22Spring), Dynamic Systems (22Spring), Modern Algebra, Modern Analysis, Numerical Algebra and Optimization, PDEs
· **Neuroscience:** Computing with Brain Circuits (22Spring)

B.S. in Chemistry (Honors Degree) **Wuhan University, China (GPA 3.81/4.0)** 2017.9-2021.6

· **Math:** Theory of ODEs, Functions of Complex Variables, Statistics, Probability Theory, Calculus, Linear Algebra
· **Computer Science:** Data Structure, Machine Learning, C Programming
· **Chemistry and Biology:** Neurobiology, Physical Chemistry, Molecular Modeling, Organic Chemistry, Analytical Chemistry

Visiting Student in Columbia College **Columbia University in the city of New York, U.S.** 2020.1-2020.5

· **Math:** Theoretical Neuroscience, Numerical Math, Theory of PDEs, Analysis and Optimization

RESEARCH EXPERIENCE

Coarse-grained method for PDEs of Integrate-and-Fire neural network 2020.9-2021.5

Advisor: Jiwei Zhang (School of Math and Statistics, Wuhan University) Research Assistant

Duties included:

- Mechanically studied a new coarse-grained framework to solve the Integrate-and-Fire (IF) neural network based on PDEs to avoid *the curse of dimensionality*.
- Rebuilt and improved a spatially ordered IF network model that matches the experimental result about neural variability.
- Modelled the CaMKII pathway in neurons to show its on/off property in Long-Term Potentiation (LTP).

Place cells generation via auto-encoder model with a strong history effect 2020.5- 2020.9

Advisor: Stefano Fusi (Centre of Theoretical Neuroscience, Columbia University) Research Assistant

Duties included:

- Simulated the memory performance of a Hopfield network with cascade synapses model to solve the *catastrophic forgetting* problem.
- Built an auto-encoder model which can naturally generate place cells in hippocampus, and implemented the cascade synapses model above to strengthen the history effect.

A novel antimicrobial treatment and a non-systematic drug delivery method 2018.6 - 2019.6

Advisor: Xianzheng Zhang (College of Chemistry and Molecular Science, Wuhan University) Research Assistant

Duties included:

- Developed a novel anti-bacterial method combining photodynamic therapy and chimeric peptides.
- Tested the idea about non-systematic drug delivery strategy to central neural system through axoplasmic transport.

PUBLICATIONS

1. Ai-Nv Zhang[†], Wei Wu[†], Chi Zhang, **Qiu-yang Wang**, Ze-Nan Zhuang, Han Cheng, and Xian-Zheng Zhang* *A Versatile Bacterial Membrane-Binding Chimeric Peptide with Enhanced Photodynamic Antimicrobial Activity* **2019** Journal of Materials Chemistry B, 7, 1087-1095.

SKILLS

Programming: python (most proficient), MATLAB, C, L^AT_EX, Julia(beginner)

Research Tools: PyTorch, scikit-learn, pandas, numpy

Experimental skills: Material Synthesis, Tumor Transplantation, Confocal Laser-Scanning Microscopy, Fluorescence Imaging

HONORS

WHU Outstanding Scholarship for Visiting Student 2020

Honor Scholarship for Hongyi College 2019

Outstanding Student Scholarship (grade 2) 2019

2nd Prize for Drama Competition in School of Sciences 2018