

Guangyuan Liao

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[Personal Webpage](#)

Research Interests

Dynamical System: Nonlinear systems, maps and chaos; Model reduction techniques for nonlinear systems;
Numerical methods: solving ODEs and PDEs; computing invariant manifolds;
Mathematical modeling in Neuroscience and cell biology: circadian oscillators, neural networks.

Education

Doctor of Philosophy - Applied Mathematics(GPA:3.833) Expected: May 2020
New Jersey Institute of Technology, Newark, NJ, USA
Master of Science - Applied Mathematics (85.7/100) June 2014
Sichuan University, Chengdu, Sichuan, China
Bachelor of Science - Applied Mathematics (Ranking:4/21) June 2011
Sichuan University, Chengdu, Sichuan, China

Experience

New Jersey Institute of Technology, Newark, NJ
- *Research Assistant* September 2016 - Present

- Advisor: Amitabha K. Bose
- Designed models of forced hierarchical coupled oscillators.
- Applied mappings and phase reduction methods to simplify the dynamics, and to understand the behaviour of coupled oscillators.

New Jersey Institute of Technology, Newark, NJ
- *Lab Instructor* Fall 2019

- Courses: Mathematical modeling (undergraduate), Teaching in mathematics (graduate).
- Responsibilities: Teaching and mentoring students to do scientific computing on various programming languages.

- *Teaching Assistant* August 2015 - Present

- Courses: Calculus I, Calculus II, Calculus III
- Responsibilities: Teaching recitation, grading, proctoring

Sichuan University, Chengdu, China
- *Research Assistant* September 2012 - July 2014

- Constructed an average implicit Finite Difference Method for Rosenau-Burgers Equation

Sichuan University, Chengdu, China
- *Teaching Assistant* September 2012 - July 2013

- Courses: Linear Algebra and Calculus
- Responsibilities: Grading, teaching recitation

Skills

Programming Languages: L^AT_EX, MATLAB, Mathematica, Julia, Python, C++, HTML
Operating Systems: Windows, Linux, MAC

Publications and Conference presentations

1. Guangyuan Liao, Casey Diekmann, Amitabha Bose (2019). Entrainment dynamics of forced hierarchical circadian systems revealed by 2-dimensional maps. submitted to SIADS, [arXiv](#).
2. Guangyuan Liao, Amitabha Bose. Apply maps to understand hierarchical coupled kuramoto oscillators with discontinuous forcing. In progress.

3. Guanyuan Liao, Casey Diekman, Amitabha Bose (2019). Mathematical Models and Tools for understanding the Entrainment of Hierarchical Circadian System. SIAM Conference on Appl. Dyn. Syst., [Poster](#).
4. Guanyuan Liao, Casey Diekman, Amitabha Bose. Entrainment dynamics of forced hierarchical circadian systems. Dynamics Days, 2020. Poster.