Jia Zhao
Associate Professor
Ph.D., 2015, University of South Carolina
At Binghamton since 2023
Areas of Interest: Mathematical modeling, numerical analysis, high-performance computations, machine learning
Summary of research interests

E-mail:	jzhao10@binghamton.edu, jzhao10@math.binghamton.edu
Fax:	(607) 777-2450

- **Ph. D. Students:**
  - Zengyan Zhang, Summer, 2024
    Thesis: Numerical Approximations and Model Order Reduction for Phase Field Equations with Application in Cellular Dynamics

---

Personal Website

- https://bingdev.binghamton.edu/jzhao10

Research Interests

I am trained as an applied and computational mathematician, aiming to strike a balance between mathematical modeling, numerical analysis, and high-performance simulations, while my application domains are multiphase complex fluids and mathematical biology. My research is highly interdisciplinary, sitting at the interface between applied mathematics, scientific computing, soft matter physics, and mathematical biology. Here are several projects I have been working on:

- Machine learning and deep neural networks on PDE model discovery
- Computational modeling of how living cells utilize LLPS to organize chemical compartments
- Hydrodynamic Models of Biofilms (biofilm formation, antimicrobial persistence, quorum sensing)
- Modeling Eukaryotic Cell Mitotic Dynamics (mitotic rounding, cell oscillation, cell motility and cytokinesis)
- Complex Fluids Model Development (multiphase fluids, active liquid crystals, viscoelastic fluids)
- Fluid Structure Interactions (FSI) in Complex Fluids with Applications in Biology and Medicine
- Modeling and Design of Multifunctional Polymeric Rod-like Nano-composites
- Accurate, Efficient and Stable Numerical Schemes for Multiphase Complex Fluids Models
- Deep Neural Network for solving Partial Differential Equations
- Software Development on Hybrid CPU-GPU Architecture