BIOGRAPHICAL SKETCH

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NAME: Wang, Yifan

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	END DATE MM/YYYY	FIELD OF STUDY
Wuhan University	BS	05/2008	Electronic Engineering
Louisiana Tech University	MS	03/2012	Applied Mathematics
Louisiana Tech University	PHD	05/2014	Computational Analysis and Modeling
University of Houston	Postdoctoral Fellow	06/2018	Fluid structure interaction modeling
University of California Berkeley	Postdoctoral Fellow	06/2020	Mathematical modeling with medical application

A. Personal Statement

I have had training in Computational Mathematics. I am specialized in mathematical modeling, numerical methods, computational fluid dynamics, and parallel computing. My research mainly relates to studying the biomedical or multiphysics problems that involve fluid-structure interaction (FSI). For example, I have successfully applied different mathematical models to study certain cardiovascular diseases and improve clinical evaluation of the disease, to model tumor growth and study corresponding tissue responses, to optimize the design of medical devices (coronary stents or artificial pancreas), and to study the self emergent behavior of active materials consists of ferromagnetic nanoparticles. These projects have facilitated continuous collaborations with individuals from medical and physics laboratories.

1. Wang Y, Čanić S, Bukač M, Blaha C, Roy S. Mathematical and Computational Modeling of Poroelastic Cell Scaffolds Used in the Design of an Implantable Bioartificial Pancreas. Fluids. 2022 July 01; 7(7):222-. Available from: https://www.mdpi.com/2311-5521/7/7/222 DOI: 10.3390/fluids7070222
2. Wang Y, Boland CR, Goel A, Wodarz D, Komarova NL. Aspirin's effect on kinetic parameters of cells contributes to its role in reducing incidence of advanced colorectal adenomas, shown by a multiscale computational study. Elife. 2022 Apr 13;11 PubMed Central PMCID: PMC9007589.
3. Čanić S, Wang Y, Bukač M. A Next-Generation Mathematical Model for Drug-Eluting Stents. SIAM Journal on Applied Mathematics. 2021 July 29; 81(4):1503-1529. Available from: https://epubs.siam.org/doi/10.1137/20M1365144 DOI: 10.1137/20M1365144
4. Bukač M, Čanić S, Tambača J, Wang Y. Fluid–structure interaction between pulsatile blood flow and a curved stented coronary artery on a beating heart: A four stent computational study. Computer Methods in Applied Mechanics and Engineering. 2019 June; 350:679-700. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0045782519301641 DOI: 10.1016/j.cma.2019.03.034

B. Positions, Scientific Appointments and Honors

Positions and Scientific Appointments

2022 - Assistant Professor, Texas Tech University

2020 - 2022 Visiting Assistant Professor, University of California, Irvine

Honors

2023 - 2028 Travel Support for Mathematicians, Simon Foundation

2023 - 2024 Excellence in Innovation Award, Texas Tech University, Department of Mathematics and Statistics

2021 - 2022 Center Fellow Award of the NSF-Simons Center at UC Irvine, NSF-Simons Center at UC Irvine

2019 - 2020 NSF-Simons Center Interdisciplinary Opportunity Award on Multiscale Cell Fate Research, NSF-Simons Center at UC Irvine

2015 - 2016 1st and 2nd Place Price in consecutive year the visualization competition (VIZAPALOOZA), Center for Advanced Computing & Data Systems

2023 SIAM Travel award for attending ICIAM 2023 meeting in Japan, SIAM

2023 2023 Summer Faculty Fellowship program in Israel, Jewish National Fund

2021 Mathematical Congress of the Americas Travel Grant, Mathematical Council of the Americas

2018 2nd Place in presentation contest in the Coastal postdoctoral annual meeting, Lawrence Berkeley National Laboratory

2018 1st place in poster presentation competition in the UH postdoctoral research annual meeting, University of Houston

2016 NSF travel award to attending the International Workshop on Fluid-Structure Interaction Problems, NSF

2015 Travel grants to attending SC16 supercomputing conference, Super Computing Conference

2012 SIAM student travel award for attending SIAM 2012 Annual conference in Seattle, SIAM

2012 Dr. Walter E Koss graduate student scholarship, Louisiana Tech University

C. Contribution to Science

1. Computational hemodynamics in areas of performing patient-specific study and conducting optimal design for medical devices.

   My previous postdoc experience at the University of Houston and the University of California-Berkeley heavily focused on numerical modeling of cardiovascular-related problems with clinical applications, as well as high-performance computing. I take responsibilities from designing mathematical models, developing numerical algorithms and actual code implementation to conducting large-scale simulations on HPC and drawing conclusion based on post-processing the results. Through continuous collaboration with two cardiology laboratories at Baylor College of Medicine and the Methodist hospital at Houston medical center, we fine-tune our solvers based on experimental measurements. Our researches were carried out on 3D human organ printing and computational simulations with anatomic and physiological conditions at the patient-specific level to perform patient-specific treatment planning, virtual surgery, and design optimization.

   a. Wang Y, Čanić S, Bukač M, Blaha C, Roy S. Mathematical and Computational Modeling of Poroelastic Cell Scaffolds Used in the Design of an Implantable Bioartificial Pancreas. Fluids. 2022 July 01; 7(7):222-. Available from: https://www.mdpi.com/2311-5521/7/7/222 DOI: 10.3390/fluids7070222
   b. Čanić S, Wang Y, Bukač M. A Next-Generation Mathematical Model for Drug-Eluting Stents. SIAM Journal on Applied Mathematics. 2021 July 29; 81(4):1503-1529. Available from: https://epubs.siam.org/doi/10.1137/20M1365144 DOI: 10.1137/20M1365144
   c. Bukač M, Čanić S, Tambača J, Wang Y. Fluid–structure interaction between pulsatile blood flow

and a curved stented coronary artery on a beating heart: A four stent computational study. Computer Methods in Applied Mechanics and Engineering. 2019 June; 350:679-700. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0045782519301641 DOI: 10.1016/j.cma.2019.03.034

d. Wang Y, Quaini A, Čanić S, Vukicevic M, Little SH. 3D Experimental and Computational Analysis of Eccentric Mitral Regurgitant Jets in a Mock Imaging Heart Chamber. Cardiovasc Eng Technol. 2017 Dec;8(4):419-438. PubMed PMID: 28695443.

2. Developing efficient multiscale models and solvers to study the tumor-stroma interaction.

a. Wang Y, Boland CR, Goel A, Wodarz D, Komarova NL. Aspirin's effect on kinetic parameters of cells contributes to its role in reducing incidence of advanced colorectal adenomas, shown by a multiscale computational study. Elife. 2022 Apr 13;11 PubMed Central PMCID: PMC9007589.