

# Jiaqi ZHANG

## CONTACT INFORMATION

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EMAIL: [jiaqi2@clemson.edu](mailto:jiaqi2@clemson.edu)  
Mathematical and Statistical Sciences  
Clemson University, Clemson, SC, USA  
<https://zjiaqi2018.github.io>

## EMPLOYMENT

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| Jul. 2020 - present   | <b>Postdoc (Advisor: Professor Timo Heister)</b><br><i>Mathematical and Statistical Sciences, Clemson University, Clemson, SC, USA</i> <ul style="list-style-type: none"><li>- Contributed more than 23,000 lines of code in total to C++ open source finite element libraries deal.II and ASPECT (Advanced Solver for Problems in Earth's ConvecTion)</li><li>- Work on matrix-free methods, geometric multigrid, high performance computing</li><li>- Mentor graduate students</li><li>- Organize computational math seminars at Clemson University</li></ul> |
| Aug. 2015 - Jun. 2020 | <b>Research/Teaching assistant</b><br><i>Department of Mathematics, Virginia Tech, Blacksburg, VA, USA</i>  |
| Aug. 2012 - Jun. 2015 | <b>Research/Teaching assistant</b><br><i>Department of Mathematics, University of Macau, Macau, China</i>   |

## EDUCATION

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| Aug. 2015 - May 2020   | Ph.D. in Applied Mathematics at Virginia Tech<br>Dissertation: <i>Finite-element simulations of interfacial flows with moving contact lines</i> ( <a href="#">link</a> )<br>Advisor: Professor Pengtao Yue |
| Aug. 2012 - Jun. 2015  | Master of Science in Mathematics at University of Macau<br>Dissertation: <i>A Modified Fast Dense Matrix Method for Fractional Diffusion Equations</i><br>Advisor: Professor Haiwei Sun                    |
| Sept. 2008 - Jun. 2012 | Bachelor of Science in Mathematics at Shantou University   |

## PUBLICATIONS

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1. Zelai Xu, Jiaqi Zhang, Yuan-Nan Young, Pengtao Yue, and James J. Feng. A comparison of four boundary conditions for the fluid-hydrogel interface. *Physical Review Fluids*. in revision
2. Lei Li<sup>#</sup>, Jiaqi Zhang<sup>#</sup>, Zelai Xu, Yuan-Nan Young, James J. Feng, and Pengtao Yue. An arbitrary lagrangian-eulerian method for simulating interfacial dynamics between a hydrogel and a fluid. *Journal of Computational Physics*, 451:110851, 2022. (<sup>#</sup> contributed equally)
3. Daniel Arndt, Wolfgang Bangerth, Bruno Blais, Marc Fehling, Rene Gassm  ller, Timo Heister, Luca Heltai, Uwe K  cher, Martin Kronbichler, Matthias Maier, Peter Munch, Jean-Paul Pelteret, Sebastian Proell, Konrad Simon, Bruno Turcksin, David Wells, and Jiaqi Zhang. The deal.II library, version 9.3. *Journal of Numerical Mathematics*, 29(3):171–186, September 2021

4. Jiaqi Zhang and Pengtao Yue. A level-set method for moving contact lines with contact angle hysteresis. *Journal of Computational Physics*, 418:109636, 2020
5. Jiaqi Zhang and Pengtao Yue. A high-order and interface-preserving discontinuous Galerkin method for level-set reinitialization. *Journal of Computational Physics*, 378:634–664, 2019

## IN PREPARATION

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1. A level-set method for 3D interfacial flows with moving contact lines. (with Timo Heister and Pengtao Yue)
2. A phase-field method for three-phase system with solidification and moving contact lines. (with Yichen Li and Pengtao Yue)

## TUTORIAL

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1. Jiaqi Zhang and Timo Heister. The deal.II tutorial step-74: Symmetric interior penalty Galerkin method for Poisson’s equation, January 2021

## RESEARCH INTERESTS

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- Computational fluid dynamics (phase transition, fluid structure interaction)
- High performance computing (efficient large-scale parallel solver)
- Matrix-free methods
- Geometric multigrid

## TEACHING

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Spring 2022	Instructor, MATH 3650 : Numerical Methods for Engineers
Spring 2021	Instructor, MATH 3650 : Numerical Methods for Engineers
Spring 2020	Instructor, MATH 1225: Calculus of a Single Variable
Fall 2019	Instructor, MATH 1225: Calculus of a Single Variable
Summer II 2019	Instructor, MATH 1025: Elementary Calculus I (online course)
Spring 2019	Lab Instructor, Math 1026: Elementary Calculus
Fall 2018	Instructor, MATH 1225: Calculus of a Single Variable
Spring 2018	Teaching Assistant, CS/CMDA 3634: Computer Science Foundations of Computational Science
Spring 2016	Tutor of the Tutoring Lab in Math Emporium
Fall 2015	Floor Staff in Math Emporium

## TECHNICAL SKILLS

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- Programming: C++, C, FORTRAN, DEAL.II (an open source finite element library), MPI(Message Passing Interface), OpenMP (Open Multi-Processing), OCCA (Open Concurrent Compute Abstraction), CUDA (Compute Unified Device Architecture)
- Software: git, Tecplot, VisIt, Paraview, MATLAB, L<sup>A</sup>T<sub>E</sub>X, Gmsh
- Operating systems: Linux, OS X

## CONFERENCES, TALKS, WORKSHOPS

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- Jul. 2021    *2021 ASPECT Hackathon*  
Virtual two-week event, Tuesday July 6 - Friday July 16  
- Added geometric multigrid to the Newton solver ([link](#))
- Jun. 2021    *Ninth deal.II Users and Developers Workshop*  
Virtual one-day meeting, June 18, 2021

- Jan. 2021 *Deal.II Simplex Workshop 2021*  
Virtual three-day workshop, January 13-15, 2021  
- Contributed a test by converting the *deal.II* Step-67 tutorial from  
a quadrilateral mesh to a triangular mesh ([link](#))
- Sept. 2020 “A level-set method for moving contact line problems with comparison  
to phase-field simulations” (Talk)  
*Computational Mathematics Seminar*  
*Clemson University, Clemson, SC, USA*
- Jul. 2020 *p4est 2020 HCM Summer School*  
Online event July 20th–24th, 2020
- May 2020 *Eighth deal.II Users and Developers Workshop*  
Virtual one-day meeting, May 26, 2020
- Aug. 2019 *Seventh deal.II Users and Developers Workshop*  
*Colorado State University, Fort Collins, CO, USA*
- Sept. 2019 “A level-set method for moving contact line problems with comparison  
to phase-field simulations” (Talk)  
*43rd annual meeting of the SIAM Southeastern Atlantic Section*  
*at University of Tennessee-Knoxville, Knoxville, TN, USA*
- Aug. 2019 *Seventh deal.II Users and Developers Workshop*  
*Colorado State University, Fort Collins, CO, USA*
- Feb. 2019 “An interface-preserving level-set method for interfacial flows with  
contact lines” (Talk, **travel award**)  
*SIAM Conference on Computational Science and Engineering, Spokane, WA, USA*
- Nov. 2018 “An interface-preserving level-set method for interfacial flows with  
contact lines” (Talk)  
*71st Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, GA, USA*
- Jul. 2017 “A high-order and interface-preserving discontinuous Galerkin method for  
level-set reinitialization” (Poster)  
*International Conference on Current Trends and Challenges in*  
*Numerical Solution of Partial Differential Equations,*  
*Department of Mathematics, Purdue University, IN, USA*
- Feb. 2017 “A high-order and interface-preserving discontinuous Galerkin method for  
level-set reinitialization” (Poster)  
*SIAM Conference on Computational Science and Engineering, Atlanta, GA, USA*
- Jun. 2014 “A modified fast dense matrix method for fractional diffusion equations” (Talk)  
*The 10th East Asia SIAM Conference, Pattaya, Thailand*

## REVIEWER

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- Journal of Computational Physics

## PROFESSIONAL ORGANIZATIONS

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Oct. 2017 - Aug. 2018 *Secretary of SIAM Student Chapter at Virginia Tech*