

# Joshua A. Buli

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**CONTACT INFORMATION** Department of Mathematics  
Skye Hall, Room 263  
University of California, Riverside  
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**RESEARCH INTERESTS** Numerical Methods for Partial Differential Equations and Stochastic Differential Equations, Scientific Computing, Computational Fluid Dynamics, Uncertainty Quantification

**EDUCATION** *Doctor of Philosophy, Mathematics* Expected March 2019  
University of California, Riverside, Riverside, CA  
PhD Candidate  
Advisor: Dr. Yulong Xing

*Master of Science, Applied Mathematics* Awarded March 2015  
University of California, Riverside, Riverside, CA

*Bachelor of Science, Mathematical Physics* Awarded June 2013  
*Bachelor of Arts, Mathematics*  
University at Buffalo, SUNY, Buffalo, NY  
Advisor: Dr. Jae-Hun Jung

**PUBLICATIONS**

- Buli, J., Arnott, R., *Theoretical Properties of the Basic Bathtub Model*, in preparation, (2019).
- Buli, J., Xing, Y., *A Discontinuous Galerkin Method for the Aw-Rasclé Traffic Model on a Network*, **submitted**, (2019).
- Arnott, R., Buli, J., *Solving For Equilibrium in the Basic Bathtub Model*, **Transportation Research Part B: Methodological**, Vol. 109, pp. 150-175, (2018).
- Buli, J., Xing, Y., *Local discontinuous Galerkin Methods for the Boussinesq Coupled BBM System*, **Journal of Scientific Computing**, Vol. 75, pp. 536-559, (2018).
- Buli, J., Jung, J.-H., and Chakraborty, D., *A remark on the multi-domain hybrid method for calculating the power-law decay of the gravitational radiation waveforms with the analytic radiation boundary conditions*, **International Journal of Applied Nonlinear Science**, Vol.1, pp. 104 - 121, (2014).

**HONORS AND FELLOWSHIPS** University of California, Riverside

- AMS Student Travel Award for the 2019 Joint Mathematics Meetings
- SIAM Student Travel Award for the 2019 SIAM Conference on Computational Science and Engineering
- National Center for Sustainable Transportation (NCST) Graduate Fellowship, <https://ncst.ucdavis.edu/>, The NCST is one of five national centers funded by the U.S. Department of Transportation. Fellowships are awarded through a consortium of six universities associated with the center. (Academic Year 2016-2017)
- UCR Math Department Early Promise in the Graduate Career Prize (Spring 2015)
- UCR Two Year Chancellor's Distinguished Fellowship (Fall 2013 - Spring 2015)
- UCR Graduate Division Summer Research Stipend (Summer 2013)

University at Buffalo, SUNY

- Senior Honors Thesis - (See Publications) - Advisor: Dr. Jae-Hun Jung
- Harriet Montague Award (Outstanding Junior in the Mathematics Department)
- Sekula Scholarship (Top Students in Physics Department)
- Deans List for seven semesters - Fall 2009 - Spring 2012, Spring 2013

**RESEARCH  
EXPERIENCE**

*Research Assistant, Department of Economics* March 2015 - Present  
University of California, Riverside, Riverside, CA  
Research Assistant under supervision of Professor Richard Arnott. Computational modeling in traffic dynamics and congestion pricing.

*Research Assistant, Department of Mathematics* June 2016 - Present  
University of California, Riverside, Riverside, CA  
Research Assistant under supervision of Professor Yulong Xing and Professor Mark Alber. Numerical analysis for deterministic and stochastic partial differential equations; computational modeling of multi-phase flow and blood clots.

**TEACHING  
EXPERIENCE**

*Teaching Assistant* September 2013 - Present  
University of California, Riverside, Riverside, CA  
Experience teaching under-represented students as a Teaching Assistant for College Algebra, Pre-calculus, Single Variable Calculus, Multivariable Calculus, Ordinary Differential Equations, Partial Differential Equations I, II, and III.

*Adjunct Instructor* August 2015 - May 2018  
Chaffey College, Rancho Cucamonga, CA  
Experience teaching under-represented students as an instructor for Calculus II (2 times), College Algebra (2 times), Elementary Algebra (3 times).

*Instructor* Summer Terms 2013, 2017, 2018  
University of California, Riverside, Riverside, CA  
Instructor for the Math Support Practicum (Pre-calculus) for Summer Bridge Program, Single Variable Calculus (2 times).

*Teaching Assistant* August 2011 - May 2013  
University at Buffalo, SUNY, Amherst, NY  
Teaching Assistant for Single Variable Calculus (2 times), and Ordinary Differential Equations .

**OUTREACH**

- Mentored two high school students from under-represented groups in STEM at Martin Luther King High School in Riverside, CA for local science fair. The students project entailed learning the theory behind random walks in 1D, 2D, and 3D, as well as coding random walks in Python and Jupyter notebooks.

**TALKS GIVEN**

- SIAM Conference on Computational Science and Engineering – Spokane, WA – February 25 - March 1, 2019 – A Discontinuous Galerkin Method for the Aw-Rascle Traffic Flow Model on Networks
- AMS Joint Mathematics Meetings – Baltimore, MD – January 16-19, 2019 – A Discontinuous Galerkin Method for the Aw-Rascle Traffic Flow Model on Networks
- Center for Quantitative Modeling in Biology – Riverside, CA – October 16, 2018 – A Computational Multi-phase Model for Predicting Deformation and Embolization of Partially Obstructive Blood Clots

- Applied Math Seminar – Ohio State University – Columbus, OH – September 27, 2018 – DG Method for Network Traffic Models
- Graduate Student Seminar – UCR – November 2016 – The Discontinuous Galerkin Method
- 2<sup>nd</sup> Annual SIAM Central States Section – Little Rock, AR – October 2016 – A Local Discontinuous Galerkin Method for the Coupled BBM-BBM System
- Graduate Student Seminar – UCR – April 2016 – Theory and Numerical Methods for Stochastic Ordinary Differential Equations
- Industrial and Applied Math Seminar – UCR – June 2015 - Numerical Methods for Stochastic Differential Equations
- PDE Graduate Elective – UCR – March 2015 – Deriving Einstein Field Equations by Variational Calculus
- PDE and Applied Math Seminar – UCR – June 2014 – Approximating Gravitational Waves using MDHM

## CONFERENCES ATTENDED

- SIAM Conference on Computational Science and Engineering – Spokane, WA – February 25 - March 1, 2019
- AMS Joint Mathematics Meetings – Baltimore, MD – January 16-19, 2019
- Riverside Mathematics Workshop for Excellence and Diversity – Riverside, CA – October 19-20, 2018
- 1<sup>st</sup> Annual Center Symposium on Multiscale Cell Fate – Beckman Center of the National Academies of Sciences and Engineering, University of California, Irvine – Irvine, CA – October 1-2, 2018
- SIAM Conference on Uncertainty Quantification – Garden Grove, CA – April 16-19, 2018
- Institute for Computational and Mathematical Engineering (ICME) Fundamentals of Data Science Workshop – Stanford University – Stanford, CA – August 14-18, 2017
- Frontiers in Applied Mathematics – Brown University – Providence, RI – January 4-6, 2017
- 2<sup>nd</sup> Annual SIAM Central States Section – University of Arkansas, Little Rock – Little Rock, AR – September 30 - October 2, 2016

## COMPUTER SKILLS

*Languages & Software:* Most of my projects have used Python and MATLAB. I also have experience with C++, FreeFem++, Mathematica, HTML, L<sup>A</sup>T<sub>E</sub>X, Microsoft Office Suite (Word, Excel, PowerPoint, and Outlook)

*Operating Systems:* Linux (Ubuntu), Windows