RUI (RAY) QU

Curriculum Vitae

Houston, TX — rq10@rice.edu — (919) 904-9996 — ray-qu.com

EDUCATION

Ph.D. in Computational and Applied Mathematics
Aug 2022 - Dec 2026 (expected)
Rice University
Department of Computational Applied Mathematics and Operations Research
Advisor: Dr. Jesse Chan
GPA: 4.0/4.0.

B.S. in Statistics and Analytics; B.S. in Mathematics (with Highest Distinction)
Aug 2018 - Aug 2021
The University of North Carolina at Chapel Hill
Department of Statistics and Operations Research; Department of Mathematics
GPA: 3.96/4.0.

RESEARCH INTERESTS

Reduced Order Modeling, Numerical Methods for PDEs, Mathematical Physics

EXPERIENCE/EMPLOYMENT

Chan Research Group, Rice University Department of CMOR
Jan 2023 - Present
PI: Dr. Jesse Chan
Position: Graduate Research Assistant
Description: Extending reduced order modeling (ROM) of nonlinear conservations laws from finite volume methods (FVM) to discontinuous Galerkin (DG) methods with new hyper-reduction techniques.

Group of Applied Mathematics and Plasma Physics (T-5), Los Alamos National Laboratory
June 2024 - Aug 2024
PI: Dr. Svetlana Tokareva
Position: Graduate Research Assistant
Description: Applied model order reduction to stochastic finite volume methods (SFVM) for uncertainty quantification (UQ) in high-dimensional stochastic PDE systems.

Physical Math Lab, UNC-Chapel Hill Department of Mathematics
Oct 2019 - Aug 2022
PI: Dr. Pedro Sáenz
Position: Undergraduate/Postbac Research Assistant
Description: Conducted research active spintronics enabling bistability-based computations within hydrodynamic spin lattices (HSLs).

PUBLICATIONS

Refereed Journal Article

(in prep) Entropy stable reduced order modeling of nonlinear conservation laws using discontinuous Galerkin methods. **Ray Qu**, Akil Narayan, Jesse Chan.

(in prep) Active Kuramoto spintronics enables bistability-based computation. **Ray Qu**, Michael V. Edwards, Sam E. Turton, Rodolfo R. Rosales, Pedro J. Sáenz.

Thesis

(in prep) Entropy stable reduced order modeling of nonlinear conservation laws using discontinuous Galerkin methods. **Ray Qu**. Master's Thesis, Rice University.

AWARDS AND HONORS

2024 MORe Participation Award
2024 Alan Weiser Memorial Travel Award
2018 UNC Summer Graduation Scholarship

CONFERENCE AND INVITED TALKS

Talks

Entropy stable reduced order modeling of nonlinear conservation laws using DG methods
Oct 2024, Houston, TX
RTG-NASC Annual Workshop

Jul 2024, Vancouver, Canada
16th World Congress on Computational Mechanics/4th Pan American Congress on Computational Mechanics

Apr 2024, Houston, TX
RTG-NASC Ranch Retreat

Mar 2024, Houston, TX
Finite Element Rodeo

Feb 2024, Houston, TX
CMOR Grad Seminar

Posters

Entropy stable reduced order modeling of nonlinear conservation laws using DG methods
Sep 2024, La Jolla, CA
Model Reduction and Surrogate Modeling (MORe)

Nov 2023, Lafayette, LA
SIAM TX-LA 6th Annual Meeting

Oct 2023, Houston, TX
RTG-NASC Annual Workshop

Attendee

Mar, 2023, College Station, TX
Finite Element Rodeo

Nov, 2022, Houston, TX
SIAM TX-LA 5th Annual Meeting

TEACHING EXPERIENCE

CMOR 304 Differential Equations in Engineering and Science (Fall 2024)
Rice University, Teaching Assistant

CMOR 527 Discontinuous Galerkin Methods (Spring 2024)
Rice University, Grader

CMOR 302 Matrix Analysis (Fall 2023)
Rice University, Teaching Assistant

CAAM 382 Stochastic Models (Spring 2023)
Rice University, Grader

CAAM 378 Intro to OR and Optimization (Fall 2023)
Rice University, Grader

SERVICE TO DEPARTMENT

2023-2024 Rice CMOR Grad Seminar Chair
Hosted CMOR weekly grad seminar talks from graduate students and faculty.

Member, Research Training Group in Numerical Mathematics and Scientific Computing (RTG-NASC)
Actively participating different activities in the research training group, such as annual workshops, ranch retreats, seminars, etc.

PROFESSIONAL SKILLS

Coding
Julia, Java, Python, C++, MATLAB, R.

COURSEWORK

Research Relevant Coursework

Rice CMOR 510 Modeling Mathematical Physics
Rice CMOR 526 Finite Element Methods
Rice CAAM 536 Numerical Methods for PDEs
Rice CAAM 542 Discontinuous Galerkin Methods
Rice CAAM 553 Advanced Numerical Analysis

Other Coursework

Rice CAAM 554 Systems of Equations and Unconstrained Optimization
Rice CAAM 571 Linear and Integer Programming
Rice COMP 582 Graduate Design and Analysis of Algorithms
UNC MATH 548 Combinatorial Math
UNC MATH 594 Nonlinear Dynamics
UNC STOR 556 Advanced Methods of Data Analysis
UNC STOR 614 Advanced Optimization