John Steinman

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Education

Ph.D., Computational & Applied Mathematics (expected) May 2027
Rice University
Advisor: Matthias Heinkenschloss
GPA: 4.0

B.S. Computational Engineering May 2022
The University of Texas at Austin
GPA: 3.98

B.S. Mathematics May 2022
The University of Texas at Austin
GPA: 3.98

Research and Work Experience

Graduate Student Researcher, Rice University Aug 2022-Present
Dept. of Computational Applied Mathematics & Operations Research
- Studied collocation methods for the solution of optimization problems, with applications in biophysical models for neuron cells and trajectory optimization of hypersonic vehicles
- Developed python code to solve general dynamic optimization problems via direct collocation

Undergraduate Student Researcher, The University of Texas at Austin Sep 2020-May 2022
Willerson Center for Cardiovascular Modeling and Simulation
- Developed inverse finite element framework to estimate spatially varying material parameters in hydrogel media used to study heart cells

Summer Intern, Firefly Aerospace, Cedar Park, TX June 2020-Aug 2022
Guidance, Navigation, and Control Team
- Used Monte Carlo methods to optimize system parameters in rocket flight simulation

Summer Intern, MD Anderson Cancer Center, Houston TX June 2019-Aug 2019
Department of Biostatistics
- Used machine learning to predict breast cancer diagnoses from gene expression data

Publications

1. A. Khang, J. Steinman, R. Tuscher, X. Feng, and M. S. Sacks. Estimation of aortic valve interstitial cell-induced 3d remodeling of poly(ethylene glycol) hydrogel environments using an inverse finite element approach. *Acta Biomaterialia*, 160:123–133, 2023. doi:10.1016/j.actbio.2023.01.043

Talks and Presentations

1. J. Steinman. On the convergence of collocation methods for initial value problems. Presentation, Research Training Group in Numerical Mathematics and Scientific Computing at Rice University Annual Ranch Retreat, 20 April 2024, Houston, TX

2. J. Steinman. Impact of representation of collocation methods on dynamic optimization problems. Poster, 6th Annual Meeting of the SIAM Texas-Louisiana Section, 4 Nov. 2023, Lafayette, LA

3. J. Steinman. Impact of representation of collocation methods on dynamic optimization problems. Poster, Research Training Group in Numerical Mathematics and Scientific Computing at Rice University Annual Workshop, 13 Oct. 2023, Houston, TX

4. J. Steinman, A. Khang, X. Feng, and M. S. Sacks. Simulation of the local mechanical behavior of 3d poly(ethylene glycol) hydrogels for studying cell mechanics. Presentation, Annual Gulf Coast Undergraduate Research Symposiuma at Rice University, Oct. 16, 2021, Houston, TX, 2021

Honors and Awards

Ken Kennedy Institute Computational Science and Engineering Recruiting Fellowship 2022-Present
Rice University
- $15,000 awarded over 4 years

Dr. Hans M. Mark Scholars Endowment in Engineering Honors 2018-2022
The University of Texas at Austin
- $56,000 awarded over 4 years

H. Bascom Funchess Jr. Scholarship 2018-2022
The University of Texas at Austin
- $12,000 awarded over 4 years

Distinguished College Scholar The University of Texas at Austin 2019-2022

University Honors, The University of Texas at Austin 2018-2022

National Merit Scholarship 2018
- $1,500 award

Service

Ranch Retreat Organizer, Rice University Jan 2024-April 2024
Research Training Group (RTG) in Numerical Mathematics and Scientific Computing
- Organized first annual RTG Ranch Retreat in Houston, TX
- Invited graduate student and postdoctoral speakers from neighboring universities

Graduate Recruitment Organizer, Rice University Feb 2024
Dept. of Computational Applied Mathematics & Operations Research
- Organized visit weekends for prospective Ph.D. students

Academic Coach, The University of Texas at Austin Jan 2020-Sep 2020
Ramshorn Scholar Program
- Mentored freshmen engineering students and provided supplemental course instruction

After-School Coach, Score Athletics, Austin, TX Jan 2020-May 2020
- Coached after-school sports at elementary schools in under-served communities

Teaching

Grader, Rice University Aug 2022-Present
Dept. of Computational Applied Mathematics & Operations Research
- CAAM 336, Fall 2022, Spring 2020
- CMOR 420/520, Fall 2023
- CMOR 421/521, Spring 2024

Academic Tutor, The University of Texas at Austin Jan 2020-May 2020
- Calculus, differential equations, physics, chemistry, and other engineering classes

Skills

Programming: Python, C++, Linux, MATLAB, Julia, R, FORTRAN
Software: FEniCS, Jax, ParaView, OpenFOAM, SolidWorks, Git, LaTeX, Excel, Word, PowerPoint

References

Matthias Heinkenschloss, Ph.D.
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(Undergraduate research mentor)