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Education

- Jun 2008 **University of Pennsylvania**, Philadelphia, 19104.
Ph.D in *Mechanical Engineering and Applied Mechanics*.
Advisor: George Biros
- Jul 2003 **Indian Institute of Technology (Madras)**, Chennai, India.
Bachelor of Technology in *Mechanical Engineering*.

Appointments

- Sep 2011 – Present **Assistant Professor**
Department of Mathematics
University of Michigan, Ann Arbor, 48109
- Jul 2008 – Aug 2011 **Research Scientist**
Courant Institute of Mathematical Sciences
New York University, NY, 10012
Mentor: Denis Zorin

Visiting Positions

- Visiting Professor, École Nationale Supérieure de Techniques Avancées (ENSTA), Paris, 2014.
(visit sponsored by *Fondation Mathématique Jacques Hadamard*)

Awards and Honors

- Plenary Speaker, MICDE Annual Symposium, 2016.
- NSF CAREER Award, 2015.
- Ralph E. Powe Junior Faculty Award, 2013.
- ACM Gordon Bell Prize, 2010.
- Best Paper Award Finalist, ACM/IEEE Conference on Supercomputing, 2010.
- Graduate Research Fellowship, University of Pennsylvania, 2003-2008.

External Grants

- “Fast numerical algorithms for high-fidelity simulation of terramechanics.”
U.S. Army TARDEC/Automotive Research Center, 2016-2017.
Role: Principal Investigator (Sole PI) Award: \$137,995
- “CAREER: Fast algorithms for particulate flows.”
National Science Foundation DMS - 1454010, 2015-2020.
Role: Principal Investigator (Sole PI) Award: \$420,721

- “I-Corps: High-fidelity simulation software for microfluidics.”
National Science Foundation IIP - 1559706, 2015-2016.
Role: Principal Investigator (Sole PI) Award: \$50,000
- “Fast high-order methods for electrohydrodynamics of vesicle suspensions.”
National Science Foundation DMS - 1418964, 2014-2017.
Role: Principal Investigator (Sole PI) Award: \$216,637
- “Scalable Numerical Methods for Solving PDEs on Moving Geometries.”
Simons Foundation Collaboration Grant for Mathematicians, 2014-2019.
Role: Principal Investigator (Sole PI) Award: \$35,000
- “Mathematical and experimental study of lipid bilayer shape and dynamics mediated by surfactants and proteins.”
National Science Foundation DMS - 1224656, 2012-2015.
Role: Principal Investigator (Other PIs: Yuan-nan Young, Howard Stone) Award: \$105,728

Publications

In Draft (* indicates advisee)

1. E. Corona* and S. Veerapaneni. Low-Re particulate flow simulations using vector spherical harmonics. To be submitted to *Journal of Fluid Mechanics*, 2017.
2. B. Wu* and S. Veerapaneni. Pairwise hydrodynamic interactions of vesicles in applied electric fields. To be submitted to *Journal of Fluid Mechanics*, 2017.

Under Review

3. K. Liu, G. Marple, S. Li, S. Veerapaneni and J. Lowengrub. Dynamics of a multicomponent vesicle in shear flow. Submitted to *Soft Matter*, 2016.
4. A. Barnett, G. Marple*, S. Veerapaneni and L. Zhao. A unified integral equation scheme for doubly-periodic Laplace and Stokes boundary value problems in two dimensions. Submitted to *Communications on Pure and Applied Mathematics*, 2016.

Peer-reviewed Publications

5. E. Corona*, L. Greengard, M. Rachh and S. Veerapaneni. Integral equation methods for rigid bodies in Stokes flow in three dimensions. *Journal of Computational Physics*, Volume 332, pp. 504-519, 2017.
6. S. Veerapaneni. Integral equation methods for vesicle electrohydrodynamics in three dimensions. *Journal of Computational Physics*, Volume 326, pp. B740-B772, 2016.
7. G. Marple*, A. Barnett, A. Gillman and S. Veerapaneni. A fast algorithm for simulating multiphase flows through periodic geometries of arbitrary shape. *SIAM Journal on Scientific Computing*, Volume 38, Issue 5, 2016.
8. O. -S. Pak, Y. -N. Young, G. Marple*, S. Veerapaneni and H. Stone. Gating of a mechanosensitive channel due to cellular flows. *Proceedings of the National Academy of Sciences*, Volume 112, No. 32, 2015.
9. A. Barnett, B. Wu*, and S. Veerapaneni. Spectrally-accurate quadratures for evaluation of layer potentials close to the boundary for the 2D Stokes and Laplace equations. *SIAM Journal on Scientific Computing*, Volume 37, Issue 4, 2015.
10. G. Marple*, P. Purohit and S. Veerapaneni. Equilibrium shapes of planar elastic membranes. *Physical Review E*, Volume 92, No. 1, July 2015.

11. A. Rahimian, S. Veerapaneni, D. Zorin and G. Biros. Boundary integral method for the flow of vesicles with viscosity contrast in three dimensions. *Journal of Computational Physics*, Volume 298, pp. 766-786, 2015.
12. Z. Gimbutas, L. Greengard and S. Veerapaneni. Efficient representations for the fundamental solutions of Stokes flow in a half space. *Journal of Fluid Mechanics*, Volume 776, Aug. 2015.
13. Y. -N. Young, S. Veerapaneni and M. Miksis. Long-wave dynamics of an inextensible planar membrane in an electric field. *Journal of Fluid Mechanics*, Volume 751, pp. 406-431, 2014.
14. Z. Gimbutas and S. Veerapaneni. A fast algorithm for spherical grid rotations and its application to singular quadrature. *SIAM Journal on Scientific Computing*, Volume 35, Issue 6, 2013.
15. S. Jiang, S. Veerapaneni and L. Greengard. Integral equation methods for unsteady Stokes flow in two dimensions. *SIAM Journal on Scientific Computing*, Volume 34, Issue 4, 2012.
16. S. Veerapaneni, Y. -N. Young, P. M. Vlahovska and J. Blawdziewicz. Dynamics of a compound vesicle in shear flow. *Physical Review Letters*, Volume 106, Issue 15, 2011.
17. S. Veerapaneni, A. Rahimian, G. Biros and D. Zorin. A fast algorithm for simulating vesicle flows in three dimensions. *Journal of Computational Physics*, Volume 230, Issue 14, 2011.
18. A. Rahimian, I. Lashuk, S. Veerapaneni, A. Chandramowlishwaran, D. Malhotra, L. Moon, R. Sampath, A. Shringarpure, J. Vetterz, R. Vuduc, D. Zorin and G. Biros. Petascale direct numerical simulation of blood flow on 200K cores and heterogeneous architectures. *Proceedings of the 2010 ACM/IEEE International Conference for High Performance Computing, Networking, Storage and Analysis*. (Gordon Bell Prize)
19. R. Sampath, H. Sundar and S. Veerapaneni. Parallel fast Gauss transform. *Proceedings of the 2010 ACM/IEEE International Conference for High Performance Computing, Networking, Storage and Analysis*. (Finalist, Best Paper Award)
20. M. Spivak, S. Veerapaneni and L. Greengard. The fast generalized Gauss transform. *SIAM Journal on Scientific Computing*, Volume 32, Issue 5, pages 3092-3107, October 2010.
21. A. Rahimian, S. Veerapaneni and G. Biros. Dynamic simulation of locally inextensible vesicles suspended in an arbitrary two-dimensional domain, a boundary integral method. *Journal of Computational Physics*, Volume 229, Issue 18, Pages 6466-6484, September 2010.
22. S. Veerapaneni, D. Gueyffier, G. Biros and D. Zorin. A numerical method for simulating the dynamics of 3D axisymmetric vesicles suspended in viscous flows. *Journal of Computational Physics*, Volume 228, Issue 19, Pages 7233-7249, October 2009.
23. S. Veerapaneni, D. Gueyffier, D. Zorin and G. Biros. A boundary integral method for simulating the dynamics of inextensible vesicles suspended in a viscous fluid in 2D. *Journal of Computational Physics*, Volume 228, Issue 7, Pages 2334-2353, April 2009.
24. S. Veerapaneni, R. Raj, G. Biros and P. K. Purohit, Analytical and numerical solutions for shapes of Quiescent 2D Vesicles. *International Journal of Non-linear Mechanics*, Volume 44, Issue 3, Pages 257-262, April 2009.
25. S. Veerapaneni and G. Biros. The Chebyshev fast Gauss and nonuniform fast Fourier transforms and their application to the evaluation of distributed heat potentials. *Journal of Computational Physics*, Volume 227, Issue 16, Pages 7768-7790, August 2008.
26. S. Veerapaneni and G. Biros. A high-order solver for the heat equation in 1D domains with moving boundaries. *SIAM Journal on Scientific Computing*, Volume 29, Issue 6, Pages 2581-2606, October 2007.

27. A. Rahimian, S. Veerapaneni, D. Zorin and G. Biros. Dynamics of inextensible vesicles suspended in a confined two-dimensional Stokes flow. *Frontiers in Applied and Computational Mathematics Proceedings*, D. Blackmore, A. Bose, and P. Petropoulos, eds, World Scientific, 2008.

Invited Research Talks

- Mar 2017 Active Matter Workshop, Flatiron Institute, New York.
- Feb 2017 SIAM Conference on Computational Science and Engineering, Atlanta.
- Nov 2016 Applied & Computational Mathematics Seminar, University of California, Irvine.
- Sep 2016 AMCS Seminar, University of Pennsylvania, Philadelphia.
- Aug 2016 Army Research Office Workshop on Geo-Surface Materials, Chicago.
- Jul 2016 SIAM Annual Meeting, Boston.
- Jul 2016 Computational & Data Sciences Seminar, Indian Institute of Science, Bangalore.
- May 2016 SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia.
- Apr 2016 MICDE Annual Symposium, University of Michigan, Ann Arbor.
- Jan 2016 Applied Mathematics Colloquium, Northwestern University, Evanston.
- Nov 2015 Annual Meeting of the APS Division of Fluid Dynamics, Boston.
- Apr 2015 Applied Math Colloquium, Central Michigan University, Mt. Pleasant.
- Mar 2015 SIAM Conference on Computational Science and Engineering, Salt Lake City.
- Jul 2014 SIAM Annual Meeting, Chicago.
- Jun 2014 Center for Interdisciplinary Studies, Tata Institute of Fundamental Research, India.
- May 2014 Center for Applied Mathematics, École Polytechnique, Paris.
- Nov 2013 Applied Mathematics Colloquium, New Jersey Institute of Technology, Newark.
- Oct 2013 Applied Mathematics Colloquium, Northwestern University, Evanston.
- Oct 2013 Schlumberger–Doll Research Center, Cambridge.
- Sep 2013 Applied Mathematics Colloquium, Illinois Institute of Technology, Chicago.
- Jul 2013 Society of Engineering Science – 50th Annual Meeting, Providence.
- May 2013 Max Planck Institute of Colloids and Interfaces, Potsdam, Germany.
- Jun 2013 SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia.
- Feb 2013 SIAM Conference on Computational Science and Engineering, Boston.
- Jan 2013 Applied & Interdisciplinary Mathematics Seminar, University of Michigan.
- Jul 2012 SIAM Annual Meeting, Minneapolis.
- May 2011 Computer Science Colloquium, Swiss Federal Institute of Technology (ETH), Zürich.
- Apr 2011 Computer Science Colloquium, New York University.
- Mar 2011 Mechanical & Aerospace Engineering Seminar, Cornell University.
- Mar 2011 Scientific Computing Seminar, Southern Methodist University.
- Feb 2011 SIAM Conference on Computational Science and Engineering, Reno.
- Feb 2011 Applied & Interdisciplinary Mathematics Seminar, University of Michigan.
- Feb 2011 Widely Applied Mathematics Seminar, Harvard University.
- Feb 2011 Center for Fluid Mechanics, Turbulence and Computation, Brown University.
- Oct 2010 Fluid Mechanics Seminar, New Jersey Institute of Tehnology.
- May 2010 SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia.

- May 2010 Frontiers in Applied and Computational Mathematics, Newark, NJ.
 May 2010 Graphics and Geometry Seminar, New York University.
 Nov 2009 Seminars in Engineering Science, Lehigh University.
 Mar 2009 SIAM Conference on Computational Science and Engineering, Miami.
 Oct 2008 Computational Topology, Algebra & Geometry Seminar, New York University.

Teaching

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| MATH 671 | <i>Fast Algorithms</i> | W'13, F'15, F'16 |
| MATH 572 | <i>Scientific Computing II</i> | W'16, W'17 |
| MATH 571 | <i>Numerical Linear Algebra</i> | F'13 |
| MATH 454 | <i>PDEs & Boundary Value Problems</i> | F'13 |
| MATH 450 | <i>Advanced Math for Engineers I</i> | F'15 |
| ENGR 371 | <i>Numerical Methods for Engineers</i> | F'12, W'15 |
| MATH 156 | <i>Applied Honors Calculus II</i> | F'11 |

Mentoring

Postdoctoral

- Gary Marple Sep 2016 - Present
- Eduardo Corona Sep 2014 - Present
- Mariana-Carrasco Teja (co-advised with Prof. Adefeso) Jan 2012 - Jun 2015
First job: Assistant Director for Research, MICDE, UM-Ann Arbor
- Bogdan Vioreanu Sep 2012 - Apr 2015
First job: Associate, Goldman Sachs, NYC

Graduate Students

- Hai Zhu (AIM Ph.D.) Sep 2015 - Present
- Bowei Wu (AIM Ph.D.) Sep 2012 - Present
- Gary Marple (AIM Ph.D.) Sep 2011 - Aug 2016
Thesis title: Fast, high-order algorithms for simulating vesicle flows through periodic geometries.
(Co-winner, 2016 Peter Smereka Award for Best AIM Thesis)
First job: Postdoctoral Assistant Professor, UM Math
- Hao Zheng (AIM M.S.) Summer 2015
Present position: Doctoral student at GSSI, Italy

REU Students

- Sam Christensen (UM Math) Summer 2016

Ph.D. Thesis Committee Member

- Aaron Graham (UM Nuclear Engg., Advisor: Prof. Downar) Summer 2019 (expected)
- Ben Yee (UM Nuclear Engg., Advisor: Prof. Larsen) Summer 2019 (expected)
- Ryan Whitcomb (UM Applied Physics, Advisor: Prof. Bassis) Summer 2019 (expected)
- Shaobo Wang (NJIT Applied Math, Advisor: Prof. Jiang) Jul 2016
- Ang Zhu (UM Nuclear Engg., Advisor: Prof. Downar) Jun 2016
- Lin Zhao (Dartmouth Applied Math, Advisor: Prof. Barnett) May 2015

16. Yuxuan Liu (UM Nuclear Engg., Advisor: Prof. Martin) Nov 2014
17. Herve Nganguia (NJIT Applied Math, Advisor: Prof. Young) Apr 2014

Department/University Service

- MICDE Education Committee 2016 - Present
- AIM Graduate Admissions and Fellowships Committee 2012 - Present
- Undergraduate Research Committee 2013 - Present
- Co-organized the REU Seminar Series 2013 - Present

External Service

- Panelist, XSEDE Research Allocation Committee (XRAC), May 2015 – Present.
- Panelist for National Science Foundation – 2013, 2015, 2016.
- Journal referee: Journal of Fluid Mechanics, SIAM Journal on Scientific Computing, Journal of Computational Physics, Applied Mathematical Modelling, Journal of Computational and Applied Mathematics, Communications in Mathematical Sciences, Communications in Computational Physics, SIAM Journal on Applied Mathematics, French Academy of Science, Journal of the Royal Society Interface.
- Co-organized the minisymposium, “Integral Equation Methods for Particulate Flows”, SIAM conference on Computational Science and Engineering, Atlanta, February 2017.
- Co-organized the minisymposium, “Computational Algorithms for Simulating Particulate Flows”, SIAM Annual Meeting, Boston, July 2016.
- Co-organized the symposium, “Computational Mechanics of Biomembranes”, Society of Engineering Science – 50th Annual Meeting, Brown University, July 2013.
- Co-organized the minisymposium, “Computational Algorithms for Simulating Particulate Flows”, SIAM conference on Computational Science and Engineering, Reno, February 2011.
- Co-organized the minisymposium, “Numerical Methods for Complex Fluids”, SIAM conference on Computational Science and Engineering, Miami, March 2009.
- Reviewed grant proposals for the City University of New York (CUNY) Research Foundation.