TAMAR T. SHINAR
CURRICULUM VITAE

Computer Science and Engineering
University of California, Riverside
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RESEARCH INTERESTS

Physics-based animation, fluid-structure interaction, computational biology.

EDUCATION

Sept 2003 - Jun 2008	**Ph.D., Scientific Computing and Computational Mathematics** Stanford University Thesis: Simulation of coupled rigid and deformable solids and multiphase fluids Research Advisor: Prof. Ronald Fedkiw
Sept 1995 - May 1998	**B.S., Mathematics, minor Computer Science** University of Illinois at Urbana-Champaign magna cum laude with Highest Distinction in Mathematics
Sept 1994 - May 1995	**Iowa State University** coursework in Physics, Chemistry, and Mathematics concurrent with senior year of high school

ACADEMIC APPOINTMENTS

Jul 2020 - present Jul 2011 - Jun 2020	**Associate Professor** **Assistant Professor** Computer Science and Engineering University of California, Riverside
Sept 2008 - Jun 2011	**Postdoctoral Fellow** Courant Institute of Mathematical Sciences New York University Research Advisor: Prof. Michael Shelley

HONORS AND AWARDS

2014 - 2017, 2011 - 2014	Amrik Singh Poonian Term Chair in Computer Science and Engineering
Sept 1995 - Jun 1996	University of Illinois Jobst Scholar
Spring 1995	Frank Miller Scholarship

PROFESSIONAL AFFILIATIONS

2006 - present   Association for Computing Machinery (ACM)
2009 - 2012   American Physical Society (APS)
2009 - 2011   Genetics Society of America (GSA)

PROFESSIONAL ACTIVITIES

Reviewer

Computer Graphics	ACM SIGGRAPH, ACM SIGGRAPH Asia, ACM/Eurographics Symposium on Computer Animation, Graphics Interface, ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games, Eurographics, Graphical Models, Computers & Graphics, ACM Transactions on Graphics, Pacific Graphics
Scientific Computing	PLOS One, Journal of Computational Physics, Computer Methods in Applied Mechanics and Engineering, Journal of Scientific Computing
Computer Science	Celebration of Women in Computing SoCal
Grant Proposals	National Science Foundation DMS/NIGMS Panelist

Conference Organization and Committees

2013 - present	Scientific Committee Member, Southern California Symposium on Flow Physics
2019	Organizing Committee Member, Posters Chair, ACM/Eurographics Symposium on Computer Animation
2019	Conflict of Interest Coordinator, ACM SIGGRAPH Technical Papers Committee
2017, 2018	Technical Papers Committee Member, ACM SIGGRAPH
2017	Session Chair, ACM SIGGRAPH 2017, Fluids II Session
2012, 2014, 2016	Program Committee Member, SoCal Celebration of Women in Computing

Workshop Participant

Nov 2018	Workshop for Interactive Immersive Intelligent Systems (I3S), University of California, Irvine
Oct 2018	Riverside Mathematics Workshop for Excellence and Diversity, University of California, Riverside
May 2018	Workshop on Interdisciplinary Biological Research, University of California, Riverside
Feb 2012	The Dynamics of Elastic Biostructures in Complex Fluids, New York University
Jan 2012	Grant Writers Seminar Workshop, University of California, Riverside
Jul 2011	Hydrodynamics, University of Colorado, Boulder
Nov 2010	The Dynamics of Elastic Biostructures in Complex Fluids, Tulane University
Mar 2010	Evolutionary Perspectives on Mechanisms of Cellular Organization, KITP, University of California, Santa Barbara

RESEARCH FUNDING

Cumulative funding (PI or subaward): $509,604
Cumulative funding (all roles): $4,147,861

6. UCR Academic Senate Research and Travel Awards, Omnibus Grant, single PI, $950, 07/01/2018 - 06/30/2019

5. UCR Academic Senate Research and Travel Awards, Omnibus Grant, single PI, $900, 07/01/2019 - 06/30/2020

4. U.S. Department of Education, Office of Postsecondary Education GAANN Fellowships in Computer Science and Engineering, co-PI (PI: V. Tsotras, co-PI: E. Keogh), $885,834, 09/01/2015 - 08/31/2018

3. National Science Foundation, IIS, CGV: Large: Collaborative Research: Coupling Simulation and Mesh Generation using Computational Topology, Award Number 1314813, UCR PI (Utah PI: A. Bargteil (lead), Utah co-PI: V. Pascucci, Arizona PI: J. Levine), $1,599,982, (T.S.: $349,982), 08/01/2013 - 07/31/2018

2. National Institutes of Health, Understanding mitotic spindle positioning through integrated modeling and experiment, Project Number 5R01GM104976-04, co-PI (subaward) (PI: M. Shelley, co-PI: D. Needleman, co-PI: M. Betterton), $1,589,195 (T.S.: $157,772), 07/01/2012 - 04/30/2016

1. UCR Chancellor's Strategic Initiatives Task Force for Competitive Grant Raising in Robotics, $71,000 co-PI (PI: V. Zordan), 09/01/2011 - 10/01/2012

PUBLICATIONS

Google scholar profile: Citations = 843, h-index = 9 (as of 08/2019)

In Preparation

[22] Y. Zhang, **T. Shinar**, and A. Bargteil, "Interpolation of transformations using the singular value decomposition"

Under Review/Revision

[21] M. Akbay, C. Schroeder, and **T. Shinar**, "Boundary pressure projection for partitioned solution of fluid-structure interaction with incompressible dirichlet fluid domains," *Journal of Computational Physics, submitted*, p. 39, 2019

[20] S. Cook and **T. Shinar**, "Enabling simulation of high-dimensional micro-macro biophysical models through hybrid cpu and multi-gpu parallelism," *arXiv preprint arXiv:1908.04279*, 2019

Publications

[19] O. Ding, **T. Shinar**, and C. Schroeder, "Affine particle in cell method for mac grids and fluid simulation," *Journal of Computational Physics, in press*, 2019

[18] A. W. Bargteil and **T. Shinar**, "An introduction to physics-based animation," in *ACM SIGGRAPH 2019 Courses*, ACM, 2019, 57 pages (first offered in 2018, videos: part 1, part 2)

[17] M. Akbay, N. Nobles, V. Zordan, and **T. Shinar**, "An extended partitioned method for conservative solid-fluid coupling," *ACM Transactions on Graphics (TOG)*, vol. 37, no. 4, p. 86, 2018

[16] S. C. Cook, C. Hohenegger, and **T. Shinar**, "A micro-macro framework for analyzing steric and hydro-dynamic interactions in gliding assays," *Multiscale Modeling & Simulation*, vol. 15, no. 4, pp. 1768–1796, 2017

[15] M. Falkenstein, B. Jones, J. A. Levine, **T. Shinar**, and A. W. Bargteil, "Reclustering for large plasticity in clustered shape matching," in *Proceedings of the Tenth International Conference on Motion in Games*, p. 5, ACM, 2017

[14] B. Jones, **T. Shinar**, J. Levine, and A. W. Bargteil, "Efficient collision detection for example-based deformable bodies," in *Proceedings of the Tenth International Conference on Motion in Games*, p. 4, ACM, 2017

[13] B. Jones, N. Thuerey, **T. Shinar**, and A. W. Bargteil, "Example-based plastic deformation of rigid bodies," *ACM Transactions on Graphics (TOG)*, vol. 35, no. 4, p. 34, 2016

[12] B. Jones, A. Martin, J. A. Levine, **T. Shinar**, and A. W. Bargteil, "Ductile fracture for clustered shape matching," in *Proceedings of the 20th ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games*, pp. 65–70, ACM, 2016

[11] B. Jones, A. Martin, J. A. Levine, **T. Shinar**, and A. W. Bargteil, "Clustering and collision detection for clustered shape matching," in *Proceedings of the 8th ACM SIGGRAPH Conference on Motion in Games*, pp. 199–204, ACM, 2015

[10] C. Hohenegger, S. Cook, and **T. Shinar**, "Dimensional reduction of a multiscale continuum model of microtubule gliding assays," *SIAM Journal on Applied Mathematics*, vol. 74, no. 5, pp. 1338–1353, 2014

[9] A. Robinson-Mosher, **T. Shinar**, P. A. Silver, and J. Way, "Dynamics simulations for engineering macromolecular interactions," *Chaos: An Interdisciplinary Journal of Nonlinear Science*, vol. 23, no. 2, p. 025110, 2013

[8] **T. Shinar**, M. Mana, F. Piano, and M. J. Shelley, "A model of cytoplasmically driven microtubule-based motion in the single-celled caenorhabditis elegans embryo," *Proceedings of the National Academy of Sciences*, vol. 108, no. 26, pp. 10508–10513, 2011

[7] A. Robinson-Mosher, **T. Shinar**, J. Gretarsson, J. Su, and R. Fedkiw, "Two-way coupling of fluids to rigid and deformable solids and shells," in *ACM Transactions on Graphics (TOG)*, vol. 27, p. 46, ACM, 2008

[6] **T. Shinar**, C. Schroeder, and R. Fedkiw, "Two-way coupling of rigid and deformable bodies," in *Proceedings of the 2008 ACM SIGGRAPH/Eurographics Symposium on Computer Animation*, pp. 95–103, Eurographics Association, 2008

[5] J.-M. Hong, **T. Shinar**, and R. Fedkiw, "Wrinkled flames and cellular patterns," *ACM Transactions on Graphics (TOG)*, vol. 26, no. 3, p. 47, 2007

[4] E. Sifakis, **T. Shinar**, G. Irving, and R. Fedkiw, "Hybrid simulation of deformable solids," in *Proceedings of the 2007 ACM SIGGRAPH/Eurographics symposium on Computer animation*, pp. 81–90, Eurographics Association, 2007

[3] F. Losasso, **T. Shinar**, A. Selle, and R. Fedkiw, "Multiple interacting liquids," in *ACM Transactions on Graphics (TOG)*, vol. 25, pp. 812–819, ACM, 2006

[2] J.-M. Hong, **T. Shinar**, M. Kang, and R. Fedkiw, "On boundary condition capturing for multiphase interfaces," *Journal of Scientific Computing*, vol. 31, no. 1-2, pp. 99–125, 2007

Theses

[1] **T. Shinar**, *Simulation of coupled rigid and deformable solids and multiphase fluids.* PhD thesis, Stanford University, 2008

STUDENT SUPERVISION

All students supervised at the Department of Computer Science and Engineering, University of California, Riverside.

Current Graduate Students

Jason Goulding, Ph.D.

Past Graduate Students

Muzaffer Akbay, Ph.D., 2018. Dissertation: *Improving the Performance of Partitioned Methods for Solid-Fluid Coupling*
Steven Cook, Ph.D., 2017. Dissertation: *Modeling, Simulation, and High-Performance Implementation of High-Dimensional Micro-Macro Biophysical Models*
Nicholas Nobles, M.S., 2017
Wojiech Karas, M.S., 2015
Paul Cernea, M.S., 2015
Lingli Wang, M.S., 2014

Undergraduate Students

Brenda Boudaie, Tanish Arora, Kevin Huang, Jonathan Kaneshiro, Elias Sells, Mark Lieu, Will Usher

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TEACHING

CS 193	Undergraduate Senior Design (Summer 2019, Winter 2019)
CS 179N	Computer Graphics Capstone Project (Spring 2019)
CS 130	Computer Graphics (Winter 2019, Winter 2018, Fall 2017, Fall 2015, Winter 2013, Spring 2012)
CS 210	Scientific Computing (Fall 2018, Spring 2018, Spring 2017, Spring 2016, Winter 2015, Fall 2012). Introduced course.
CS 230	Computer Graphics (Winter 2016, Fall 2014, Winter 2012)
CS 30	Introduction to Computational Science and Engineering (Spring 2015, Spring 2014)
CS 260	Physics-Based Simulation for Computer Graphics (Spring 2013)

UNIVERSITY AND COMMUNITY SERVICE

02/2019 - present	CSE Undergraduate Curriculum Review Committee
08/2018 - present	National Center for Women & Information Technology Department Representative
06/2017 - present	Interdisciplinary Center for Quantitative Modeling in Biology Steering Committee
01/2017 - present	Jewry and Innovation Research Grant Committee
02/2019 - 02/2019	Society for Women Engineers Meeting Panelist
09/2015 - 04/2016	CSE Faculty Search Committee
10/2011 - 03/2015	CSE Graduate Admissions Committee
03/2016 - 09/2016	Bourns College of Engineering Dean Search Committee
10/2016 - 08/2017	Human Neuroimaging Cluster Hiring Committee
01/2012 - 06/2012	Mentor, Project Lead the Way, Martin Luther King High School, Riverside, CA
01/2011 - 05/2011	Mentor, Technovation Challenge, New York City, NY
06/2008 - 08/2008	Academic Mentor, Research in Industrial Projects for Students, IPAM, UCLA

OTHER WORK EXPERIENCE

Jun 2008 - Aug 2008	**Research Assistant** with Prof. Joseph Teran, Department of Mathematics, University of California, Los Angeles
Summer 2008	**Academic Mentor**, Research in Industrial Projects for Students (RIPS), Institute for Pure and Applied Mathematics (IPAM), University of California, Los Angeles
Apr 2008 - Jun 2008	**Consultant**, SimQuest
Spring 2006, Spring 2005	**Teaching Assistant**, Numerical Solution of Partial Differential Equations, Stanford University
Sept 2004 - Dec 2004	**Research Assistant**, with Prof. Gene Golub, Department of Computer Science, Stanford University
Aug 2003 - May 2004	**Research Assistant**, Institute for the Study of Learning and Expertise, Stanford University
Nov 1999 - Aug 2003	**Software Engineer**, Equity Derivatives, KBC Financial Products, New York
Aug 1998 - Nov 1999	**Software Engineer**, Derivatives Technology, D. E. Shaw & Co., New York
Apr 1997 - Jul 1998	**Research Programmer**, with Prof. David Wilkins, Knowledge Based Systems Group, Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign
1996 - 1997	**Student Programmer**, with Prof. Craig Bethke, Hydrogeology Research Lab, University of Illinois at Urbana-Champaign

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TALKS

Invited Talks

Feb 2019	Computational modeling of cytoskeletal phenomena, Southern California Systems Biology Conference, Center for Complex Biological Systems, University of California, Irvine
Nov 2018	Physics-based animation and computational biomechanics, Workshop for Interactive Immersive Intelligent Systems (I3S) University of California, Irvine
Oct 2018	Fluid-structure interaction: numerical algorithms and applications, Riverside Mathematics Workshop for Excellence and Diversity, University of California, Riverside

May 2018	Physics-based simulation in computer graphics and biology, ACM Women in Computing Meeting, University of California, Riverside
May 2018	Computational modeling of cytoskeletal phenomena, Workshop on Interdisciplinary Biological Research, UCR Interdisciplinary Center for Quantitative Modeling in Biology, University of California, Riverside
Sept 2015	Physics-based simulation for computer graphics and biology, Harvey Mudd College CS Colloquium, Claremont, California
May 2013	Fluid coupling in continuum modeling of microtubule motility assays, Applied Math and PDE Seminar, University of California, Riverside
Feb 2013	Virtual Worlds: Simulation in computer graphics and biology, Osher LIFE Lecture Series, Riverside, California
Feb 2013	Physically-based simulation for computer graphics and computational cell biomechanics, Harvey Mudd College CS Colloquium, Claremont, California
Feb 2012	A computational model of microtubule-based motion in the single-celled *C. elegans* embryo, Aerospace and Mechanical Engineering Seminar, University of Southern California, Los Angeles
Nov 2011	Simulation of fluid-structure interaction with applications in computer graphics and cell biology, Computer Science and Engineering Colloquium, University of California, Riverside
Oct 2011	Mechanical Engineering Colloquium, Department of Mechanical Engineering, University of California, Riverside
Mar 2011	Applied Mechanics Colloquium, School of Engineering and Applied Sciences, Harvard University
Feb 2011	Numerical studies of microtubule-based motion in the single-celled *C. elegans* embryo, Fluid Mechanics Seminar, New Jersey Institute of Technology
Feb 2011	Numerical studies of microtubule-based motion in the single-celled *C. elegans* embryo, Mechanical Engineering seminar, University of California, Merced
Feb 2011	Physically-based simulation for computer graphics and computational biomechanics, Computer Science and Engineering Colloquium, University of California, Riverside
Feb 2011	Numerical studies of microtubule-based motion in the single-celled *C. elegans* embryo, Mathematical Biology Seminar, University of Utah
Jan 2011	Numerical studies of microtubule-based motion in the single-celled *C. elegans* embryo, Mathematical Sciences Colloquium, Rensselaer Polytechnic Institute
Nov 2010	Numerical studies of microtubule-based motion in the single-celled *C. elegans* embryo, Applied Math Seminar, New York University
Nov 2008	Adding secondary dynamics to animated characters, Computational Topology, Algebra and Geometry Seminar, New York University
Oct 2008	Coupling incompressible flow to volumetric and thin solids, Numerical Analysis and Scientific Computing Seminar, New York University
May 2008	Two-way coupling of rigid and deformable bodies, Silicon Valley Chapter ACM SIGGRAPH, Cupertino, CA

Apr 2008	Two-way coupling of fluids to rigid and deformable solids and shells, Linear Algebra and Optimization Seminar, Stanford University
Mar 2008	Two-way coupling of fluids to rigid and deformable solids and shells, Bay Area Scientific Computing Day, Berkeley, CA
May 2007	Hybrid simulation of deformable solids, NIH Center for Biomedical Computation at Stanford, Stanford University
Apr 2007	Hybrid simulation of deformable solids, Media Technology Days, University of Linköping, Sweden

Contributed Presentations

Jul 2019	An introduction to physics-based animation, SIGGRAPH 2019 Courses, ACM SIGGRAPH, Los Angeles, CA
Aug 2018	An introduction to physics-based animation, SIGGRAPH 2018 Courses, ACM SIGGRAPH, Vancouver, Canada
Nov 2012	A numerical method for Stokes flow in a complex geometry coupled to dynamic rigid structures and filaments, APS Division of Fluid Dynamics, 65nd Annual Meeting, San Diego, CA
Jul 2011	A model of microtubule-based pronuclear motion in the single-celled *C. elegans* embryo, Boulder Hydrodynamics Summer School. Boulder, CO
Nov 2010	Numerical studies of microtubule-based motion in the single-celled *C. elegans* embryo, APS Division of Fluid Dynamics, 63nd Annual Meeting, Long Beach, CA
Aug 2010	An integrated model of microtubule-based pronuclear motion in the single-celled *C. elegans* embryo, SIAM Conference on Nonlinear Waves and Coherent Structures, Philadelphia, PA
May 2010	A numerical method for the two-way coupled simulation of structures in a Stokes fluid, 2010 DOE Applied Mathematics Program Meeting, Berkeley, CA (poster presentation)
Nov 2009	A computational study of male pronuclear migration in the *C. elegans* embryo, APS Division of Fluid Dynamics, 62nd Annual Meeting, Minneapolis, MN
Jun 2009	A computational study of male pronuclear migration in the *C. elegans* embryo, 17th International *C. elegans* Meeting, UCLA (poster presentation)