

Luoding Zhu

Department of Mathematical Sciences
Indiana University-Purdue University Indianapolis (IUPUI)
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EDUCATION

- PhD in Applied Mathematics (2001), Courant Institute of Mathematical Sciences, New York University, USA (Advisor: Prof. Charles S. Peskin)
- MS in Fluid Dynamics (1992), Beijing Institute of Applied Physics and Computational Mathematics (BIAPCM), P.R.China (Advisor: Prof. Jihai Wang)
- BS in Mechanics (1989), Department of Mechanics, Zhejiang University, P.R.China (Advisor: Prof. Benzhao Zhang)

ACADEMIC APPOINTMENT

- Associate Professor (July 2010 - Present), Department of Mathematics, Indiana University-Purdue University Indianapolis
- Assistant Professor (August 2004 - June 2010), Department of Mathematics, Indiana University-Purdue University Indianapolis
- Sept. 2001-July 2004, Postgraduate Researcher, Division of Computational Sciences and Engineering, Department of Computer Science at UCSB (Mentor: Prof. Linda Petzold)
- Sept. 1997-Aug. 2001, TA/RA, Courant Institute of Mathematical Sciences, New York University
- Sept. 1992-June 1997, Research Associate/Assistant Professor, the Laboratory of Computational Physics, BIAPCM, P.R. China

AWARDS AND HONORS

- Favorite Professor, selected by students of the Athletics Department of the IUPUI, 2006, 2011
- Outstanding Dissertation in the Natural Sciences Award, New York University, April, 2002
- William Magnus Prize (for significant contribution to mathematical sciences), Courant Institute of Mathematical Sciences, New York University, February 2002
- Harold Grad Prize, Courant Institute of Mathematical Sciences, New York University, April 2001
- The First Prize at the 12th Academic Conference at the BIAPCM, Oct. 1996 (paper presented: 3D Simulations of Richtmyer-Meshkov Instability)
- Admission to the graduate school of the BIAPCM with exemption from national entrance examinations, 1989

RESEARCH INTERESTS

- Modeling and Simulation of Blood Flows
- Modeling and Simulation of Fluid Flow Over Osteocytes
- Modeling and Simulation of Cancer Cell Metastasis
- Numerical Methods for Fluid Structure Interaction
- Scientific Computing

Ongoing Research Projects

- 1) A new 3D parallel IB method with application to hemodialysis (funded by NSF-DMS, Lead PI, participating graduate students: Z Bai and Y Fu)
- 2) Multiscale modeling and simulation of interstitial fluid flow over an osteocyte in bone matrix
- 3) An extreme scale IB method with applications
- 4) Modeling and simulation of cancer cell metastasis

Current Research Funding

- Luoding Zhu (Lead PI), Suchuan Dong (PI), and Fengguang Song (Co-PI), “Collaborative Research: A New Three-Dimensional Parallel Immersed Boundary Method with Application to Hemodialysis”, \$299,314, Division of Mathematical Sciences, National Science Foundation, Award No. DMS-NSF 1522537, 1522554. September 15 2015 - August 31 2018.

Past Research Funding

- Luoding Zhu, Sungsoo Na, and Hiroki Yokota, “Modeling and Simulation of Fluid Flows around Osteocytes”, May 1 2015 - Dec 31 2016. \$10,000, Integrated Nanosystems Development Institute (INDI), IUPUI.
- Yongguang Cheng, Luoding Zhu, and Hui Zhang, ”A 3D immersed boundary method for turbulent flow with application”, 650,000 Yuan (approximately \$100,000), China National Science Foundation (NSFC), Division of Mathematical and Physical Sciences, January 1 2012- December 31, 2015. (Provided funds of \$17,000 for the purchase of a supercomputer (Dragon) for Zhu for research which is still being used.)
- Luoding Zhu, Released Time for Research Grant (RTR), \$10,000, Office of Vice Chancellor for Research, IUPUI, (for teaching reduction) May 2013 – April 2014.
- Luoding Zhu, “A 3D implicit immersed boundary method with application”, \$193,484, National Science Foundation (NSF), DMS-0713718, July 1 2007 to June 30 2010.

External Travel Support

- Travel support to attend international workshop on fluid-structure-interaction problems, Institute of Mathematical Sciences, National University of Singapore, May 30 -June 3, 2016.
- Travel support to attend the 2nd international conference on scientific computing, Nanjing, China, May 22-25, 2012.
- Partial travel support to attend the 63rd Annual Meeting of APS Division of fluid dynamics, Long Beach, CA, USA, Nov 21-23, 2010.
- Travel support (\$1350 Canadian Dollars) to attend the workshop on fluid motion driven by immersed structures, Fields Institute, University of Toronto, Canada, August 9-13, 2010.
- Travel support to attend the NSF summer institute on mechanics of soft material, Hilton Garden Inn, Evanston, Illinois, USA, May 10-12, 2010.
- Travel support (\$1,600) from the Conference Organizers to attend the 6th International Conference for Mesoscopic Methods in Engineering and Science, July 13-17, Guangzhou, PR China, 2009.
- Travel support to attend the Day of Sciences, Oak Ridge National Laboratory, Oct 29, 2007.
- Travel support to attend the opening workshop on the random media, the SAMSI, Sept 23-26, 2007.
- Travel support to attend the workshop on Blood Flows in the microcirculation, the MBI, Ohio State University, Jan. 22-26, 2007.
- Travel support to attend the New Direction Short Course on Biophysical Fluid Dynamics, the IMA, University of Minnesota, Twin Cities, June 19-30, 2006.

PUBLICATIONS

Book Chapter

[1] HY Chen, L Zhu, Y Huo, Y Liu, and GS Kassab (2009), “Fluid-Structure Interaction (FSI): Modeling in the Cardiovascular System”, in *Modeling and Applications in Heart Failure. Guccione JM and Kassab GS (Eds.), Hardcover, 436 pages, Springer (Oct 8 2009). ISBN-10:1441907297. ISBN-13:978-1441907298.*

Editorial

[1] F Tian, Y Sui, **L Zhu**, L, C Shu, & HJ Sung (2016), “Computational Methods and Models in Circulatory and Reproductive Systems”. *Computational and Mathematical Methods in Medicine*, Article ID 9028409, p.1-2.

Peer-Viewed Journal Publications

(*Referred conference papers are treated as good as refereed journal papers for computer scientists.*)

[34] **L Zhu**, X Yu, N Liu, X Lu, Y Cheng, “Drag reduction and scaling of a deformable sheet in non-Newtonian fluid flow”. *Physics of Fluids*, Accepted, July 2017.

[33] R Zigon, **L Zhu**, and F Song, “Interactive 3D simulation for fluid-structure-interaction using two GPUs”, *The Journal of Supercomputing*, Accepted, June 2017.

[32] Y Fu, F Song, and **L Zhu** (2016), “Modeling and Implementation of an Asynchronous Approach to Integrating HPC and Big Data Analysis”, The 16th International Conference

on Computational Science, San Diego, CA, June 2016.

[31] C Zhang, Y Cheng, L Zhu, and J Wu (2016), “Accuracy improvement of the immersed boundary-lattice Boltzmann coupling scheme by iterative force correction”. *Computers & Fluids*, 124 (1), p.246-260.

[30] C Tang, L Zhu, G Akingba, and X Lu (2015), “Viscous flow past a collapsible channel as a model for self-excited oscillation of blood vessels”, *Journal of Biomechanics* 48 (10), p.1922-1929, July 2015.

[29] P Nagar, F Song, L Zhu, L Lin, ”LBM-IB: A Parallel Library to Solve 3D Fluid-Structure Interaction Problems on Manycore Systems”, in it The 44th International Conference on Parallel Processing (ICPP), Beijing, China, September 2015. (acceptance rate 32%)

[28] R Hua, L Zhu, and X Lu (2014), “Dynamics of fluid flow past a circular plate in three dimensions”, *Journal of Fluid Mechanics* 759, p.56-72.

[27] R Hua, L Zhu, X Lu (2014), “Numerical investigation of the dynamics of a flexible filament in the wake of cylinder”, *Advances in Applied Mathematics and Mechanics* 6(4), p.478-493.

[26] YG Cheng, L Zhu, and C Zhang (2014), “Stability and accuracy of the coupling scheme of the immersed boundary method and the lattice Boltzmann BGK model”, *Communications in Computational Physics* 16(1), p.136-168, 2014.

[25] R Hua, L Zhu and X Lu (2013), “Locomotion of a flapping flexible plate”, *Phys. Fluids* 25(12), Article No. 121901.

[24] H Yu, R Chen, H Wang, Z Yuan, Y Zhao, Y An, Y Xu, and L Zhu (2013), “GPU accelerated lattice Boltzmann simulation for rotational turbulence”, *Computers & Mathematics with Applications* 67 (2), pp.445-451.

[23] FB Tian, L Zhu, P Fok, and X Lu (2013), ”Simulation of a pulsatile non-Newtonian flow past a stenosed 2D artery with atherosclerosis”, *Computers in Biology and Medicine* 43, 1098-1113.

[22] L Miller, A Santhanakrishnan, S Jones, C Hamlet, K Mertens, and L Zhu (2012), ”Reconfiguration and reduction of vortex induced vibrations in broad leaf”, *Journal of Experimental Biology* 215(15), 2716-2727.

[21] G Li, L Zhu, and X Lu (2012), ”Numerical studies on locomotion performance of fishlike tail fins”, *Journal of Hydrodynamics* 24 (4), 488-495.

[20] FB Tian, H Luo, L Zhu, X Lu (2011), “Coupling modes of three filaments in side-by-side arrangement”, *Physics of Fluids* 23 (11), 111903 (2011).

[19] J Hao and L Zhu (2011), “A 3D implicit immersed boundary method with application”,

Theoretical and Applied Mechanics Letter **1** (6), 062002 (4 pages) (2011).

[18] S Wang, L Zhu, X Zhang, and G He, “Flow past two freely rotatable triangular cylinders in tandem arrangement”, *Journal of Fluids Engineering* **133** (8), 081202 (12 pages) (2011).

[17] FB Tian, H Luo, L Zhu, X Lu, JC Liao (2011), “An efficient immersed boundary-lattice Boltzmann method for the hydrodynamic interaction of elastic filaments”, *Journal of Computational Physics* **230** (19), p.7266-7283 (2011).

[16] L Zhu, G He, S Wang, L Miller, X Zhang, Q You and S Fang (2011), “An immersed boundary method by the lattice Boltzmann approach in three dimensions with application”, *Computers and Mathematics with Applications* **61**, p.3506-3518.

[15] FB Tian, H Luo, L Zhu, and X Lu (2010), “Interaction between a flexible filament and a downstream rigid body”, *Physical Review E*, **82** (2), Article Number: 026301 (2010).

[14] J Hao and L Zhu (2010), “A lattice Boltzmann based implicit immersed boundary method for fluid-structure-interaction”, *Computers and Mathematics with Applications* **59** (1), pp. 185-193.

[13] L Zhu (2009), “Interaction of two tandem deformable bodies in a flowing viscous fluid”, *J. Fluid Mech.* **635**, pp. 455-475.

[12] Q You, S Fang and L Zhu (2009), “Visualizing vortex shedding of an elastic plate interacting with a 3D viscous flow”, in *Proceedings of the IEEE 9th International Conference on Computer and Information Technology (CIT 2009)*, Oct. 11-14, 2009, Xiamen, PR China.

[11] HY Chen, J Hermiller, A Sinha, M Sturek, L Zhu, and GS Kassab (2009), “Effects of Intravascular Stent Sizing on Endothelial and Vessel Wall Stress: Potential Mechanisms of In-stent Restenosis”, *Journal of Applied Physiology* **106**(5), pp. 1686-91.

[10] L Zhu and R Chin (2008), “Simulation of elastic filaments interacting with a 2D viscous pulsatile flow”, *Computational Methods in Applied Mechanics & Engineering* **197**(25-28), pp. 2265-2274.

[9] L Zhu (2008), “Scaling laws for drag of a compliant body moving in an incompressible viscous fluid”, *Journal of Fluid Mechanics* **607**, pp. 387-400.

[8] L Zhu (2007), “Viscous flow past an elastic fibre tethered at its center point: vortex shedding”, *Journal of Fluid Mechanics*, **587**, pp. 217-234.

[7] L Zhu (2007), “Simulation of a non-homogeneous elastic filament falling in a flowing soap film”, *Physics of Fluids* **19**(1), Art. No. 017113.

[6] L Zhu and CS Peskin (2007), “Drag of a flexible fibre in a 2D moving viscous fluid”, *Computers & Fluids* **36**(2), pp. 398-406.

[5] L Zhu, D Tretheway, L Petzold, and C Meinhart (2005), “Simulation of fluid slip at hydrophobic microchannel walls by the lattice Boltzmann method”, *Journal of Computational Physics* 202(1), pp. 181-195.

[4] J Zhou, L Zhu, L Petzold, and T Yang (2004), “Parallel simulation of fluid slip in a microchannel”, in *18th International Parallel and Distributed Processing Symposium* (Acceptance rate approximately 30%), April 26-30, 2004, Santa Fe, New Mexico.

[3] L Zhu and CS Peskin (2003), “Interaction of two parallel flexible filaments in a flowing soap film”, *Physics of Fluids*, 15(7), pp. 1954-1960.

[2] L Zhu and CS Peskin (2002), “Simulation of a flexible flapping filament in a flowing soap film by the immersed boundary method”, *Journal of Computational Physics* 179(2), pp. 452-468.

[1] L Zhu and J Wang (1994), “The formation and propagation of a shock wave formed during the gravitational collapse of a gaseous polytrope”, *Acta Astrophysica Sinica*, 14(4), pp. 358-366.

Papers Submitted

C Strickland, CS Brown, LM Childs, J Delaney, AM Ho, EW Jenkins, NP Kristensen, S Kumar, V Pasour, PD Shipman, D Taylor, L Waldrop, L Zhu, and LA Miller, “The fluid physics of long distance dispersal and its significance to ecology and epidemiology”, in revision, (review paper).

M Sanden, R Zigon, L Zhu, W Strychalski, S Na, and H Yokota, “Modeling and simulation of fluid flow over an osteocyte”. Submitted to *J. of Biological System*, in revision, 2017.

Papers in Preparation

Y Lu, N Liu, L Zhu, and X Lu, ”A lattice-Boltzmann finite-element based immersed boundary method for viscoelastic-fluid structure interaction”.

Conference Proceedings and Other Publications

[9] M Sanden, R Zigon, L Zhu, S Na, and H Yokota, “Fluid flow over an osteocyte: modeling and simulation”, Proceedings of the 5th International Conference on Computational and Mathematical Biomedical Engineering CMBE2017, 10-12 April 2017, United States, P. Nithiarasu, A.M. Robertson (Eds.)

[8] Yongsam Kim, Luoding Zhu, Xiaodong Wang and Charles Peskin (2003), “On various techniques for computer simulation of boundaries with mass,” in *Proceedings of the Second MIT Conference on Computational Fluid and Solid Mechanics*, (Editor K.J. Bathe), pp1746-1750.

[7] Derek C. Tretheway, Luoding Zhu, Linda Petzold, and Carl D. Meinhart (2002), “Examination of the slip boundary condition by micro-PIV and lattice Boltzmann simulation,” in *2002 ASME International Mechanical Engineering Congress & Exposition*, New Orleans, Louisiana.

[6] David M. McQueen, Charles S. Peskin, and Luoding Zhu (2001), “The immersed bound-

ary method for incompressible fluid-structure interaction,” in *Proceedings: First MIT Conference on Computational Fluid and Solid Mechanics*, pp 26-29, Editor K.J. Bathe.

[5] Jihai Wang, Luoding Zhu and Zhongzhen Zhang (1996), “The nonlinear stage of Richtmyer-Meshkov instability”, *Symposium of the Commemoration Meeting for the 40th Anniversary of the Chinese Mechanical Society*, Beijing, PR China.

[4] Luoding Zhu, Xiaolin Li and Jihai Wang (1996), “3-D simulations of Richtmyer-Meshkov instability”, *Annual Report of the National Key Laboratory of Computational Physics*, BIAPCM, pp 182-186.

[3] Luoding Zhu and Jihai Wang (1995), “Simulations with k-epsilon model on turbulent mixings occurred on the late stage of interface instability”, *Symposium of the 7th National Conference on Shock Tubes and Shock Waves*, pp 159-165, Luoyang, China.

[2] Luoding Zhu and Jihai Wang (1994), “Analysis on gravitational collapse and shock formation during the contraction of a gaseous polytrope”, *Symposium of the 6th National Conference on Shock Tubes and Shock Waves*, pp 60-65, Sichuan, China.

[1] Luoding Zhu and Benzhao Zhang (1989), “The simulative analysis of the motions of particles in viscous flows in curved pipes with annular cross-section”, *Symposium of the First National Academic Conference on Industrial Hydrodynamics*, pp 42, Hangzhou, China.

INVITED LECTURES AND TALKS

[41] Invited to give a talk at the minisymposium on “Free and Moving Boundary Problems: Methods and Applications” at the Fourteenth US National Congress on Computational Mechanics, Montreal, Canada, July 17-20 2017.

[40] “Fluid flow over an osteocyte: modeling and simulation”, Minisymposium on Recent Advances in Modeling, Computational PDEs and their Applications, the 5th International Conference on Computational and Mathematical Biomedical Engineering, 10 - 12 April 2017, Pittsburgh, PA, United States.

[39] “A deformable plate interacting with a non-Newtonian fluid in three dimensions”, Minisymposium on Nonlinear Systems and applications, 2017 Joint Mathematics Meetings, Jan 4-7 2017, Atlanta, GA, United States.

[38] “A new 3D immersed boundary method with application”, National Key Laboratory of Science and Technology on Computational Physics, Beijing Institute of Applied Physics and Computational Mathematics, Nov 11 2016, Beijing, PR China.

[37] “A new 3D immersed boundary method with application”, Tsinghua University, Nov 10 2016, Beijing, PR China.

[36] “Simulation of a non-Newtonian fluid interacting with a deformable sheet in 3D”, Institute of Mechanics, China Academy of Sciences, Nov 8 2016, Beijing, PR China.

[35] “The immersed boundary formulation”, Institute of Mechanics, China Academy of Sciences, Nov 6 2016, Beijing, PR China.

[34] “The immersed boundary method with applications”, School of Mathematical Sciences, University of Electronic Science and Technology of China, Nov 3 2016, Chengdu, Sichuan, PR China.

[33] “Simulation of a non-Newtonian fluid interacting with a deformable sheet in 3D”, Dept of Modern Mechanics, University of Science and Technology of China, Oct 12 2016, Hefei, Anhui, PR China.

[32] “Simulation of a non-Newtonian fluid interacting with a deformable sheet in 3D”, National Key Laboratory of Science and Technology on Computational Physics, Beijing Institute of Applied Physics and Computational Mathematics, Sept 30, 2016, Beijing, PR China.

[31] “Simulation of a non-Newtonian fluid interacting with a deformable sheet in 3D”, Minisymposium on “The immersed boundary method and its extensions” at the SIAM Conference on the Life Sciences, July 11-14, Boston, 2016.

[30] “A new 3D immersed boundary method with application”, International workshop on fluid-structure-interaction problems, Institute of Mathematical Sciences, National University of Singapore, May 30 - June 3, 2016.

[29] “A new 3D immersed boundary method with application”, Computational & Applied Mathematics Seminar, Dept of Mathematics, Purdue University, West Lafayette, April 18, 2016.

[28] Invited to give a talk at the the minisymposium on ”Free and Moving Boundary Problems: Methods and Applications” at the Thirteenth US National Congress on Computational Mechanics, July 26-30, 2015. (Declined because of time confliction with another conference in China.)¹

[27] “The immersed boundary method”, Laboratory of Computational Physics, Beijing Institute of Applied Physics and Computational Mathematics, July 21, 2015.

[26] “The immersed boundary method with recent applications”, Dept of Mechanical Engineering, Zhejiang University, July 18, 2015.

[25] “A 3D immersed boundary method for fluid thin-walled-structure interaction”, scientific computing seminars, University of Houston, Houston, TX, USA, April 2, 2015.

[24] “The immersed boundary method for fluid-structure-interaction with applications” and “Modeling and simulation of atherosclerosis”, Institute of fluid physics, China Academy of Engineering Physics, Mianyang, Sichuan, China, March 18, 2015.

¹Several invitations for giving talks in minisymposiums at national and international conferences were declined because of lack of travel funding after tenure application.

- [23] “Simulation of a 3D viscous flow past a deformable thin-walled circular disk tethered at its center by a new IB method”, Minisymposium on modeling of fluid-structure interaction inspired by organism motion, 2014 SIAM Annual Meeting, July 7-11, Chicago, IL, USA, 2014.
- [22] “Coupling the blood flow to the oxidation of Low-Density Lipoprotein: a simple model for a key process in atherosclerosis”, Biomath Seminar, IUPUI, Sept 25, 2012.
- [21] “A 3D implicit boundary method with application”, the 2nd international conference on scientific computing, Nanjing, China, May 22-25, 2012.
- [20] “The immersed boundary method with applications”, State Key Laboratory of Water Resources and Hydropower Engineering Science, Wuhan University, May 17, 2012, Wuhan, China.
- [19] “A lattice-Boltzmann based immersed boundary method in 3D with applications”, Dept of Mechanical Engineering, IUPUI, Sept 15, 2011.
- [18] “A 3D immersed boundary method with applications”, Dept of Mathematical Sciences, University of Delaware, May 10, 2011.
- [17] “A lattice-Boltzmann based 3D immersed boundary method with applications”, Dept of Mathematics and Statistics, Old Dominion University, March 18, 2011.
- [16] “The immersed boundary method with applications”, Dept of Mathematics, Indiana University Bloomington, December 6, 2010.
- [15] “The immersed boundary method with recent applications”, Institute of Process Engineering, Chinese Academy of Sciences, March 19, 2010, Beijing, PR China.
- [14] “A 3D lattice Boltzmann based immersed boundary method”, Dept of Modern Mechanics, University of Science and Technology of China, March 15 2010, Hefei, Anhui, PR China.
- [13] “The Immersed Boundary Method and Its Applications”, the 20th Annual Meeting of the Laboratory of Nonlinear Mechanics (the State Key Lab), Institute of Mechanics, China Academy of Sciences, Dec 21-22, 2008, Beijing, PR China.
- [12] “The immersed boundary method with applications”, School of Mathematical Sciences, Rochester Institute of Technology, May 2008.
- [11] “A Viscous Flow Past a Flexible Fiber Tethered at Its Middle Point: Drag Reduction and Vortex Shedding”, Dept of Mathematics, Kent State University, April 3, 2008.
- [10] “A Viscous Flow Past a Flexible Fiber Tethered at Its Middle Point: Drag Reduction and Vortex Shedding”, Dept of Applied Mathematics and Statistics, University of California Santa Cruz, Feb. 22, 2008.

[9] "The immersed boundary method and its applications", Dept of Mathematics and statistics, University of New Mexico, Feb 7, 2008.

[8] "A Viscous Flow Past a Flexible Fiber Tethered at Its Middle Point: Drag Reduction and Vortex Shedding", Dept of Mathematics, State University of New York at Buffalo, Jan. 11, 2008.

[7] "The Immersed Boundary Method", Applied Math Seminar, Dept of Math, Purdue Univ, March 31, 2006.

[6] "The Applications of the Immersed Boundary Method", Graduate Special Topic Lecture, Dept of Applied Math and Statistics, New York State Univ Stony Brook, April 24, 2006.

[5] "Simulation of Elastic Filaments Interacting With a Viscous Pulsatile Flow", Dept of Math, University of Michigan, Nov 10 2006.

[4] "The immersed boundary method with applications", Dept of Mechanical Engineering, IUPUI, Sept 22, 2005.

[3] Invited talk at The 14th International Conference on Discrete Simulation of Fluid Dynamics in Complex Systems, Kyoto University, Kyoto, Japan, August 22 - 26, 2005. (Declined over Green Card concern)

[2] Invited to give a talk at the Dept of Mechatronics, Gwangju Institute of Science and Technology, South Korea, Oct 2005. (Declined over Green Card concern)

[1] Invited to attend the annual meeting of the Laboratory of Nonlinear Mechanics, the Institute of Mechanics, China Academy of Science, Beijing, Dec 16-17, 2006. (Declined over Green Card concern)

Other Invited Professional Visits

[5] Invited visit to National Key Laboratory of Science and Technology on Computational Physics, Beijing Institute of Applied Physics and Computational Mathematics, Sept 16 - Oct 2, Oct 17 - Nov 17, 1016, Beijing, PR China.

[4] Invited visit to Dept of Modern Mechanics, University of Science and Technology of China, Oct 9- Oct 16 2016, Hefei, Anhui, PR China.

[3] Invited visit to North Carolina State University for possible research collaboration, Raleigh, August 5-8 2014.

[2] Invited visit to Wuhan University, Wuhan, China, May 8-21, 2012.

[1] Invited visit to University of Wisconsin Milwaukee, May 2008.

PRESENTATIONS AT CONFERENCES AND MEETINGS

- 11) “A 3D immersed boundary method for thin-walled structures”, the 12th International Conference for Mesoscopic Methods in Engineering and Science, Beijing, PR China, July 20-24, 2015.
- 10) “A 3D lattice-Boltzmann based implicit immersed boundary method” (poster), the workshop on fluid motion driven by immersed structures, Fields Institute, University of Toronto, Canada, August 9-13, 2010.
- 9) “A lattice Boltzmann based implicit immersed boundary method for fluid-structure-interaction” (poster), the 62nd APS Division of Fluid Dynamics Annual Meeting, Nov 22-24, Minneapolis, USA 2009.
- 8) “A 3D immersed boundary method by the lattice Boltzmann approach with application”, the 6th International Conference for Mesoscopic Methods in Engineering and Science, Guangzhou, PR China, July 13-17 2009.
- 7) “Scaling Laws for Drag of a Compliant Body in an Incompressible Viscous Fluid”, the APS 60th Annual Meeting on Fluid Dynamics, Salt Lake City, Nov 19-22, 2007.
- 6) “Simulation of Elastic Filaments Interacting With a 2D Viscous Pulsatile Flow by the IB Method”, the 7th world congress on computational mechanics, Los Angeles, July 16-22, 2006.
- 5) “Simulation of a 2D Flow Past a Flexible Fiber Tethered at Its Center Point: Vortex Shedding”, talk given at the APS 58th annual meeting of division of fluid dynamics, Chicago, November 20-22, 2005.
- 4) “Simulation of a Non-homogeneous Elastic Filament Falling in a Flowing Soap Film”, talk given at the third M.I.T. conference on computational fluid and solid mechanics, MIT, June 14-17, 2005.
- 3) “Drag of a Flexible Fiber in a 2D Moving Viscous Fluid”, talk given at SIAM conference on computational science and engineering, Orlando, Florida, February 12-15, 2005.
- 2) “Parallel Simulation of Fluid Slip at 3D Microchannel Walls”, SIAM conference on parallel processing for scientific computing, San Francisco, Feb 25-27, 2004.
- 1) “Simulation of a Flexible Flapping Filament in a Flowing Viscous Fluid by the Immersed Boundary Method”, RPI applied math days, Troy, New York, November 2000.

OTHER PROFESSIONAL ACTIVITIES

Editorial Board:

Theoretical and Applied Mechanics Letters (January 2011 - Present)

Guest Editor of the Special Issue of Computational and Mathematical Methods in Medicine (2016)

Reviewed a research proposal for German-Israeli Foundation (GIF) for Scientific Research

and

Development (GIF Young Scientists Program (2015)

Reviewed tenure/promotion material for an assistant professor (Old Dominion 2013)

Reviewed articles for the following journals:

Journal of Computational Physics

Physics of Fluids

SIAM Journal for Scientific Computing

Computer Methods in Applied Mechanics and Engineering

The Bulletin of Math Biology

Journal of Applied Numerical Mathematics

Journal of Thermophysics and Heat Transfer

Journal of Zhejiang University Science A

Journal of Fluid Mechanics

Computers and Mathematics with Applications

Mathematical Physics, Analysis and Geometry

Physica D

Journal of Fluids and Structures

Theoretical and Applied Mechanics Letters

International Journal of Biomathematics

International Journal for Numerical Methods in Fluids

Communication in Computational Physics

Mathematical Methods in Applied Sciences

Discrete and Continuous Dynamical System B

International Journal of Numerical Methods for Heat and Fluid Flow

Computer Methods in Biomechanics and Biomedical Engineering

International Journal for numerical methods in biomedical engineering

Computers and Fluids

PLOS Computational Biology

Ocean Engineering

Open Physics

Acta Mechanica Sinica

Journal of Biological Systems B

Cogent Engineering

AWM proceedings for NIMBioS Workshop for Women in Mathematical Biology

Applied Mathematical Modeling

Attended the following conferences/workshops (without presentations):

2016 Indiana Undergraduate Math Research Conference, IUPUI, July 27 2016.

The 68th Annual Meeting of the APS Division of Fluid Dynamics, Nov 22-24, Boston, 2015.

The SIAM 2008 Annual Meeting, July 7-11, San Diego, 2008.

The Midwest Numerical Analysis Day, Minneapolis, May 3, 2008.

The AMS sectional meeting, Indiana University Bloomington, April 5-6, 2008.

The Day of Sciences, Oak Ridge National Laboratory, Oct 29, 2007.

Invited participant for the opening workshop on the random media, SAMSI, Sept 23-26, 2007.

The workshop on Blood Flows in the microcirculation at the MBI, Jan. 22-26, 2007.

The New Direction Short Course on Biophysical Fluid Dynamics at the IMA, University of Minnesota

Twin Cities, June 19-30, 2006

TEACHING EXPERIENCE

Taught the following courses at the IUPUI:

Calculus & Analytical Geometry I

Calculus for Technology I

Calculus for Technology II

Complex Variables

Numerical Methods

Ordinary Differential Equations

Discrete Modeling and Game Theory

Vector Calculus

Applied Computational Methods I

Applied Computational Methods II

CURRENT GRADUATE STUDENTS

Zengding Bai (PhD student, August 2013 - present)

Yuankun Fu (PhD student, Sept 2015 - present, co-mentor with Dr. Song from Computer Science))

OFFICIAL STUDENTS/POSTDOCS MENTORED

Robert Zigon (MS student, August 2015 - Sept 2016)

Madison Sanden, Undergraduate, University of Kentucky, MBI Summer Research (June 13 - August 5, 2016)

Runan Hua (PhD student, Co-mentor, 2010 - 2014, University of Science and Technology of China)

Prateek Nagar (MS student, Co-mentor, Sept 2013 - May 2015)

Jake Zatecky (undergraduate capstone experience)

Philip Oliver (undergraduate)

Jian Hao (postdoc, Nov 2008 - July 2010, currently at SMU, Dallas)

Brian Denton (undergraduate capstone experience)

Derek Black (undergraduate capstone experience)

Sarah Simon (undergraduate capstone experience)

PROFESSIONAL MEMBERSHIP

SIAM (Society of Industrial and Applied Mathematics)

APS-DFD (American Physical Society, Division of Fluid Dynamics)