Curriculum Vitae

XIAOFENG LIU, Ph.D., P.E.

Associate Professor

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Education

PH. D. (2008)   Civil Engineering, University of Illinois at Urbana-Champaign, USA

M. S. (2007)   Applied Mathematics, University of Illinois at Urbana-Champaign, USA

M. S. (2003)   Environmental Science, Peking University, Beijing, China

B. E. (2000)   Hydraulic Engineering, Tsinghua University, Beijing, China

Professional Registration

State of Texas, Professional Engineer (License number: 110079)

Professional Experiences

2019 –   **Associate Professor**, Dept. of Civil and Environmental Engineering and Institute of Computational and Data Sciences, Penn State University, USA

2014 – 2019   **Assistant Professor**, Dept. of Civil and Environmental Engineering and Institute of CyberScience, Penn State University, USA

2010 – 2013   **Assistant Professor**, Dept. of Civil and Environmental Engineering, University of Texas at San Antonio, USA

2009.6 – 2010.1   **Visiting Research Assistant Professor**, Dept. of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, USA

2008 – 2009.5   **Postdoctoral Research Associate,** Dept. of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, USA

2003 - 2008   **Research Assistant,** Dept. of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, USA

2006.7   **Summer Intern**, Illinois State Water Survey

Professional Services and Memberships

1.   Associate editor, Journal of Hydraulic Engineering, ASCE, 2015-present
2.   Guest editor, Journal of Environmental Engineering, ASCE, 2018-2022
3.   Guest editor, Journal of Irrigation and Drainage Engineering, ASCE, 2020-2022
4.   ASCE EWRI Congress Track chair for the Hydraulics and Waterways Council, 2020-present

5. Vice Chair for ASCE EWRI Technical Committee "Sedimentation", 2022-present
6. Instructor for the workshop "Python Programming for Hydraulics Modeling" at ASCE EWRI Congress 2023
7. Chair for ASCE EWRI Technical Committee "CFD Applications in Water, Wastewater and Stormwater Treatment", 2017 – 2020
8. Local organizing committee member, the 15th OpenFOAM Workshop, Arlington, VA, 2000
9. Technical co-chair, the 10th International Conference on Scour and Erosion (ICSE-10), Arlington, VA 2020
10. Co-editor of ASCE book "Computational Fluid Dynamics: Applications in Water, Wastewater, and Stormwater Treatment", 2019
11. Vice-Chair for ASCE EWRI Technical Committee "CFD Applications in Water, Wastewater and Stormwater Treatment", 2015 – 2017
12. Co-taught a one-day short course on SRH-2D modeling at ASCE EWRI Congress 2015 with Dr. Yong Lai (developer of SRH-2D model at Bureau of Reclamation).
13. Taught a one-day short course: "*Development and application using open source computational fluid dynamics (CFD) package OpenFOAM for water resources and environmental problems*", at ASCE EWRI World Water Congress 2012.
14. Taught a one-day short course on Pre- and Post-processing for SRH-2D using Open Source Software at Taiwan Water Resources Agency, 2016.
15. Co-Convener for Session "Modeling earth surface processes using computational fluid dynamics across scales", AGU Fall Meeting, 2016-2018
16. Co-Chair for Section "Sediment Transport Modeling", ASCE EWRI Congress, 2010- 2016
17. Chair for Section "Computational Hydraulics for Sustainability", ASCE EWRI Congress, 2013-2016
18. Co-Chair for Section "High-Dimensional Modeling of River and Streams", XIX International Conference on Computational Methods in Water Resources (CMWR 2012)
19. Chair for Section "CFD Application in Environmental Hydraulics", ASCE EWRI Congress, 2010
20. Chair for Section II "Computational Environmental Fluid Mechanics", International Symposium on Environmental Hydraulics 2007
21. Instructor for a technical clinic titled "*Modeling of Earth Surface Dynamics and Related Problems using OpenFOAM*" at the NSF-funded Community Surface Dynamics Modeling System (CSDMS) annual meeting, Boulder, Colorado, 2013.
22. Organized a two-day workshop on hydraulics and sediment transport modeling with the San Antonio River Authority (SARA), 2012
23. Expert panelist for International Boundary and Water Commission, 2011-present
24. Expert panelist for the National Association of State and Utility Consumer Advocates (NASUCA), 2011
25. Member of American Geological Union (AGU)
26. Member of American Society of Civil Engineering (ASCE)
27. Member of International Association for Hydraulic Engineering and Research (IAHR)

Awards and Honors

1. Harry West Teaching Award, Penn State CEE, 2020

2. State of the Art of Civil Engineering Award, ASCE, 2020

3. Third Place ($20,000 prize), Phase I of U.S. Bureau of Reclamation Divide and Conquer Challenge for River Modeling, 2022

4. Second Place ($85,000 prize), Phase II of U.S. Bureau of Reclamation Divide and Conquer Challenge for River Modeling, 2023

Research Funding

External funding

1. Local scour around bridge piers, PI, $200,000, FHWA (through Genex), 2023-2025 (contract in negotiation)

2. Two-dimensional computational hydraulics modeling and automation, PI, $20,000, FHWA (through Genex), 2023-2024 (contract in negotiation)

3. Coupled Flow-Munition-Sediment Dynamics for Better Constraining UnMES: A Collaborative Investigation with Experiments and Modeling, Lead-PI, $680,599 (with UT Austin and Naval Research Lab), SERDP, 2024-2028 (pending SERDP Science Advisory Board approval)

4. Harnessing Physics-Informed Machine Learning to Improve Image-Based Streamflow Measurements, PI, $300,024, USGS, 2023-2026

5. Nature-based solutions for river restoration, PI, $297,791, NSF, 2019-2023 (no cost extension to 2024)

6. PFI-RP: Novel coated geotextile to enhance water drainage from soil, PI at Penn State (Lead PI: Jie Han at University of Kansas), $549,996 (Penn State $127,460), NSF, 2023-2026

7. Mentoring Institute for Sediment Transport (MIST) for Early Career Professionals at the 2023 EWRI World Environmental and Water Resources Congress and the AGU Fall Meeting, PI at Penn State (Lead PI: Jennifer Duan at University of Arizona), NSF, 2023-2024

8. In-situ stiffening and upgrading of ballasted rail track beds via cement grout injection, co-PI (PI: Farshad Rajabipour), $279,457, Center for Integrated Asset Management for Multi-modal Transportation Infrastructure Systems (CIAMTIS), U.S. DOT Region 3 University Transportation Center, 2021-2022 (no cost extension to 2023)

9. Guidelines for selection and application of Manning's roughness values in two-dimensional hydraulics models, PI, $499,995, NCHRP, 2020-2023

10. Evaluation of dust suppressants used on gravel roads – Water quality impacts and dust suppression efficacy, co-PI (PI: Bill Burgos), $102,176, PA Department of Environmental Protection, 2020-2021

11. Nature-like fish passage design for the York Haven Hydroelectric Dam, PI, (co-PIs: Johnson, P. A. and Ferreri, C. P.), $600,000, Cube Hydro Partners, 2017-2020 (no-cost extension to 2021)

12. Respiration in hyporheic zones: connecting mechanics, microbial biogeochemistry, and models, PI, $240,000, DoE (through UT Austin), 2017 – 2020 (no-cost extension to 2021)

13. Three-dimensional computational modeling of turbulent flow field, bed morphodynamics and liquefaction adjacent to munitions, PI, (co-PI: Tong Qiu), $354,379, Strategic Environmental Research and Development Program (SERDP), 2017-2020 (no-cost extension to 2021)

14. Robust ecohydraulic 3D modeling tools for rivers with complex instream structures, PI, $180,000, U.S. Bureau of Reclamation, 2017-2020

15. Impact of oil & gas wastewater disposal on lake and river Sediments, co-PI (PI: Burgos, W. D., other co-PIs: Warner, N. R., Drohan, P. J., Vanden Heuvel, J. P., and Dorman, F. L.), $330,000, NSF, 2017-2020

16. Evaluation of erodibility of sand infill placed in synthetic grass, Phase 6, co-PI (20%; PI: Hassan Ismail), $48,638, Watershed Geosynthetics LLC, 2020 - 2021

17. Evaluation of erodibility of sand infill placed in synthetic grass, Phase 5, co-PI (20%; PI: Hassan Ismail), $18,000, Watershed Geosynthetics LLC, 2020

18. Evaluation of erodibility of sand infill placed in synthetic grass, Phase 3, co-PI (25%; PI: Ming Xiao), $18,378, Watershed Geosynthetics LLC, 2020

19. Evaluation of erodibility of sand infill placed in synthetic grass, Phase 2, co-PI (30%; PI: Ming Xiao), $16,444, Watershed Geosynthetics LLC, 2020

20. Evaluation of erodibility of sand infill placed in synthetic grass, Phase 1, co-PI (30%; PI: Ming Xiao), $91,756, Watershed Geosynthetics LLC, 2019-2020

21. GRS-IBS specification modification, co-PI (50%; PI: Xiao, M.), $99,594, PennDOT, 2019-2020

22. Collaborative Research: Visualization, analysis, and HPC modeling of subglacial hydrology from high-resolution 3D conduit scans acquired with a novel sensor, PI, $272,356, NSF, 2015-2017 (no-cost extension to June 2018)

23. Quantitative modeling tools of scour and morphological impact due to large wood debris structures, $170,000, PI, Bureau of Reclamation, 2014-2016, no-cost extension to September 2017

24. Assignment agreement of Intergovernmental Personnel Act (IPA): modeling of scour and soil erodability test apparatus, $41,754, PI, U.S. Army Corps of Engineers, 2015

25. Accuracy evaluation and verification of FISP sediment samplers through CFD modeling, $25,000, PI, Federal Interagency Sedimentation Project (FISP), 2015

26. Pore-scale modeling of turbulent flows with realistic and physically correct particle arrangement, $138,979, PI, U.S. Army Corps of Engineers, 2013-2015

27. CNIC: U.S.-Danish research planning visit to catalyze computational and experimental research on scour protection of offshore wind farms, $19,654, PI, National Science Foundation, 2012-2013

28. Assessment of the effects of regional channel stability and sediment transport on roadway hydraulic structures, $248,247, PI, (co-PIs: Hatim Sharif (UTSA), Sazzad Bin-Shafique (UTSA), Jean-Louis Briaud (TAMU), Kyle Strom (UH), Keh-Han Wang (UH)), sponsored by Texas DOT, 2011-2013

29. Empirical flow parameters-A tool for hydraulic model validity assessment, $519,485, co-PI, (PI: Theodore Cleveland, Texas Tech University), sponsored by Texas DOT, 2010-2012

30. Synthesis of hydrologic and hydraulic impacts, $50,000, co-PI (PI: Hatim Sharif, University of Texas at San Antonio), sponsored by Texas DOT, 2010-2011

31. Two-dimensional modeling of hydrodynamics, sediment transport, bed scour and armoring in St. Clair River, $76,000, co-PI (PI: G. Parker), sponsored by International Joint Commission, International Upper Great Lakes Study, 2009 (when I was at UIUC)

Internal funding

1. Solving surface shallow water equations using machine learning algorithms, $30,000, Penn State Institute of Computational and Data Sciences, 2020

2. 3D data acquisition and 3D printing to construct "Digital Twins" for water and biogeochemical research, $25,000, PSIEE, Penn State University, 2015

3. Foundation protection of offshore renewable energy infrastructures, $22,000, PI, sponsored by TRAC program of UTSA, 2011-2012

4. Flow accounting for the Cibolo Creek, Boerne, Texas, $3,000, PI, sponsored by UTSA, 2011-2012

Other

1. Two-day workshop on hydraulics and sediment transport modeling for the San Antonio River Authority (SARA), $2,500, 2012

Journal Publication Reviewer

Journal of Geophysical Research, Water Resources Research, Advances in Water Resources, Journal of Hydraulic Research, Journal of Engineering Mechanics, Proceedings of the Institution of Civil Engineers journal Water Management, Ecological Modeling, Energies, Journal of Hydraulic Engineering, Journal of Hydrological Engineering, Coastal Engineering, International Journal of Numerical Methods in Fluids, International Journal of Sediment Research, Computer and Fluids, Computer and Geosciences, Journal of American Society of Agricultural and Biological Engineers, Journal of Waterway, Port, Coastal, and Ocean Engineering, Water, Geophysical Research Letters, Great Lakes Research, Physics of Fluids, Environmental Fluid Mechanics, European Journal of Mechanics, Ecological Engineering, Energies, Journal of Sediment Research, Earth Surface Processes and Landforms

Conference Paper Reviewer

The 9th International Symposium on Environmental Hydraulics, 2021, ASCE EWRI Congress 2010-present, CMWR 2012, GeoCongress 2014, RCEM 2015, ICSE 2018, 2020, 5th Joint US-European Fluids Engineering Division Summer Meeting 2018, OpenFOAM Workshop 2020, 10th International Conference on Scour and Erosion

Proposal and Project Reviewer

NSF, Delaware Sea Grant Research, Penn State University Institute of CyberScience Seed Grant, Penn State University Institutes of Energy and the Environment Seed Grant, Luxembourg National Research Fund (FNR)

Refereed Journal Papers

1. J. Farnana, A. Ecka, A. Kearney, F. L. Dormanb, H. Ismaila, E. Chase, X. Liu, N. R. Warner, W. D. Burgos (2024). Oil and Gas Produced Waters Fail to Meet Beneficial Reuse Recommendations for Use as Dust Suppressants. *Science of the Total Environment,* accepted

2. Y. Song, C. Shen, X. Liu (2023). Surrogate Model for Shallow Water Equations Solvers with Deep Learning. Journal of Hydraulic Engineering., 149(11): 04023045.

3. C. Shen, A. P. Appling, P. Gentine, T. Bandai, H. Gupta, A. Tartakovsky, M. Baity-Jesi, F. Fenicia, D. Kifer, L. Li, X. Liu, W. Ren, Y. Zheng, C. J. Harman, M. Clark, M. Farthing, D. Feng, P. Kumar, D. Aboelyazeed1, F. Rahmani1, Y. Song, H. E. Beck, T. Bindas, D. Dwivedi, K. Fang, M. Höge, C. Rackauckas, B. Mohanty, T. Roy, C. Xu, K. Lawson (2023). Differentiable modeling to unify machine learning and physics models for geoscience, Nature Review Earth & Environment, 4, 552-567

4.   D. Lu, T. Yang, X. Liu (2023). Editorial: Data-driven machine learning for advancing hydrological and hydraulic predictability. Frontiers in Water. 5:1215966.

5.   Y. Xu and *X. Liu* (2022). CFD-based evaluation and verification of FISP suspended sediment samplers. Journal of Irrigation and Drainage Engineering. 148(12): 04022043 (featured as Editor's Choice)

6.   Y. Song, A. Darzikolaei, *X. Liu* (2022). Scour and burial of underwater unexploded ordnances (UXOs): An experimental and computational investigation. Ocean Engineering. 262(15): 112146

7.   Y. G. Lai, *X. Liu*, F. A. Bombardelli, Y. Song (2022). Three-dimensional Numerical Modeling of Local Scour: A State-of-the-Art Review and Perspective. Journal of Hydraulic Engineering.

8.   A. Lee, A. F. Aubeneau, M. B. Cardenas, and *X. Liu* (2022). Hyporheic exchange due to cobbles on sandy beds. Water Resources Research. 58, e2021WR030164

9.   Y. Song, Y. Xu, H. Ismail, and *X. Liu* (2022). Scour modeling based on immersed boundary method: a pathway to practical use of three-dimensional scour models. Coastal Engineering. 171, 104037

10.   C. Zheng, J. Huang, *X. Liu*, and T. G. Cleveland (2022). Numerical simulation of drainage of permeable friction course (PFC) considering surface runoff and seepage flow. Journal of Transportation Engineering, Part B: Pavements. 148(1): 04021079

11.   S. M. Hajimirzaie, G. Constantinescu, X. Liu, T. Stoesser, and K. Zamani (2022). Computational Fluid Dynamics (CFD) Applications in Water-Resources Engineering., Journal of Irrigation and Drainage Engineering, 148(12): 02022001

12.   Y. Yuan, X. Chen, M. B. Cardenas, *X. Liu*, and L. Chen (2021), Hyporheic exchange driven by submerged rigid vegetation: a numerical study. Water Resources Research. 57(6):e2019WR026675

13.   Y. Zeng, H. Ismail, and *X. Liu* (2021). A flow decomposition method for realistic rock weir hydraulics. *Journal of Irrigation and Drainage Engineering*, 147(8): 04021030

14.   A. Lee, A. F. Aubeneau, *X. Liu*, and M. B. Cardenas (2021). Hyporheic exchange over dunes in rivers with deforming free water surface. *Water Resources Research*. 57, e2020WR028817

15.   Y. Xu and *X. Liu* (2021). An immersed boundary method with y+-adaptation wall function for smooth wall shear. *International Journal of Numerical Methods in Fluids*. 93: 1929–1946

16.   H. Ismail, M. Xiao, S. Salam, B. Scholl, and *X. Liu* (2021). Infill mobility through an engineered synthetic turf on steep slopes. *Journal of Hydraulic Engineering*. 147(8): 04021023

17.   H. Ismail, Y. Xu, and *X. Liu* (2021). Flow and scour around porous engineered log jam (ELJ) structures. *Journal of Hydraulic Engineering*. 147(1): 04020089

18.   *X. Liu*, J. Zhang, K. Nelson, Y. A. Catano-Lopera (2020). Forum: Computational Fluid Dynamics for Water, Wastewater, and Stormwater Treatment. *Journal of Environmental Engineering*. 146(11): 02520002

19.   Y. Song, Y. Xu, and *X. Liu* (2020). A gradient-limited diffusive sand slide method in scour models. *Journal of Hydraulic Engineering*. 146(11): 04020074

20.   Y. Song, Y. Lai, and *X. Liu* (2020). An immersed boundary method for simulating flow hydrodynamics in streams with complex terrains. Water, 12(8):2226. Special Issue "Multi-Dimensional Modeling of Flow and Sediment Transport" organized by guest editor Dr. Yong Lai.

21.   T. Nagel, J. Chauchat, C. Bonamy, *X. Liu*, Z. Cheng, T. Hsu (2020). Three-dimensional scour simulations with a two-phase flow model, *Advances in Water Resources*, 138, 103544.

22.   B. Li, *X. Liu*, M. H. Kaufman, A. Turetcaia, X. Chen, M. B. Cardenas (2020). Flexible and modular simultaneous modeling of flow and reactive transport in rivers and hyporheic zones. *Water Resources Research*, 56(2): e2019WR026528.

23.   Y. Wang, *X. Liu*, C. Yao, and Y. Li. Debris flow impact forces on piers with different cross section shapes, *Journal of Hydraulic Engineering*, accepted. 2019.

24.   Y. Chen, R. A. DiBiase, N. McCarroll, *X. Liu*. Rapid quantification of flow resistance in mountain streams. *Earth Surface Processes and Landforms*. accepted. 2019

25.   H. Chen, *X. Liu*, and Q. Zou, Wave attenuation and flow structures induced by submerged and suspended canopies, *Advances in Water Resources*. 123:160-172, 2019

26.   Y. Chen, *X. Liu*, J. Gulley, and K. Mankoff, Direct observations and realistic modeling of a subglacial drainage conduit. Geophysical Research Letters. 45(20): 11206-11218, 2018

27.   Y. Wang, *X. Liu*, C. Yao, Y. Li, S. Liu, & X. Zhang. Finite-volume Release of Debris Flows around Round and Square Piers: An Experimental Study, *Journal of Hydraulic Engineering*. accepted, 2018

28.   D. Liu, *X. Liu*, & X. Fu. LES-DEM Simulations of Sediment Saltation in a Rough-wall Turbulent Boundary Layer, *Journal of Hydraulic Research*, accepted, 2018

29.   Talebpour, M. & *Liu, X.* (2018) Numerical Investigation on the Suitability of a Fourth-Order Nonlinear k-omega Model for Secondary Current of Second Type in Open-Channels, *Journal of Hydraulic Research*, accepted, https://doi.org/10.1080/00221686.2018.1444676

30.   *Liu, X.* (2018) Simulations of Suspended Sediment Transport using Low-Reynolds Number (LRN) Turbulence Models with a Unified Mesh, *Journal of Hydraulic Engineering*, 144(6): 04018029

31.   Jiang, Y. & *Liu, X.* (2018). Experimental and Numerical Investigation of Density Current over Macro-Roughness. *Environmental Fluid Mechanics*. 18(1): 97-116.

32.   Burgos, W. D., Castillo-Meza, L., Tasker, T. L., Geeza, T. J., Drohan, P. J., *Liu, X.*, Landis, J. D., Blotevogel, J., McLaughlin, M., Borch, T., & Warner, N. R. (2017). Watershed-Scale Impacts from Surface Water Disposal of Oil and Gas Wastewater in Western Pennsylvania. *Environmental Science & Technology*, 51(15), 8851-8860.

33.   Xu, Y. & *Liu, X.* (2017). Hydrodynamics Around Engineered Log Jam (ELJ): A Comparison with Different Computational Modeling Approaches. *Water*, Special Issue "Stream Channel Stability, Assessment, Modeling, and Mitigation", guest editor: Peggy Johnson, 9(2), 110.

34. Zhou, Z., Hsu, T., Cox, D. & *Liu, X*. (2017). Large-Eddy Simulation of Wave-Breaking Induced Turbulent Coherent Structures and Suspended Sediment Transport on a Barred Beach. *Journal of Geophysical Research-Oceans*, 122(1), 207-235.

35. Mankoff, K., Gulley, J., Slawek, T., Covington, M., *Liu, X*., Chen, Y., Benn, D., & Glowacki, P. (2017). Roughness of a Subglacial Conduit under Hansbreen, Svalbard. *Journal of Glaciology*, 63(239), 423-435.

36. Waterman, D. M., *Liu, X*., Motta, D., & Garcia, M. H. (2016). Analytical Lagrangian Model of Sediment Oxygen Demand and Reaeration Flux Coevolution in Streams. *Journal of Environmental Engineering*, 142(7), 04016028.

37. Shen, C., Wang, S., & *Liu, X*. (2016). Geomorphological Significance of the At-Many-Stations Hydraulic Geometry. *Geophysical Research Letters*, 43(8), 3762–3770.

38. Liu, D., *Liu, X*., Fu, X., & Wang, G. (2016). Quantification of the Bedload Effects on Turbulent Open Channel Flows. *Journal of Geophysical Research-Earth Surface*, 121(4), 767–789.

39. *Liu, X*., Chen, Y., & Shen, C. (2016). Coupled Two-dimensional Surface Flow and Three-dimensional Sub-surface Flow Modeling for the Drainage of Permeable Road Pavement. *Journal of Hydrological Engineering*. 10.1061/(ASCE)HE.1943-5584.0001462,.

40. *Liu, X*. (2016). Analytical Solutions for Steady Two-Dimensional Suspended Sediment Transport in Channels with Arbitrary Advection Velocity and Eddy Diffusivity Distributions. *Journal of Hydraulic Research*, 54(4), 1-10.

41. *Liu, X*., and M. Nayamatullah (2014). Semianalytical solutions for one-dimensional unsteady nonequilibrium suspended sediment transport in channels with arbitrary eddy viscosity distributions and realistic boundary conditions, *Journal of Hydraulic Engineering*, 140(5), 04014011.

42. *Liu, X*. (2014). New Near-Wall Treatment for Suspended Sediment Transport Simulations with High-Reynolds Number (HRN) Turbulence Models. *Journal of Hydraulic Engineering*, 140(3):333-339.

43. *Liu, X*., & Jiang, Y. (2014). Direct Numerical Simulations of Boundary Condition Effects on the Propagation of Density Current in Wall-Bounded and Open Channels. *Environmental Fluid Mechanics*, 14(2), 387–407.

44. S. Sinha, *X. Liu*, and M.H. Garcia (2013). A Three-dimensional Water Quality Model of Chicago Area Waterway System (CAWS), *Environmental Modeling & Assessment*, DOI 10.1007/s10666-013-9367-1

45. *X. Liu* (2013), Parallel Modeling of Three-Dimensional Variably Saturated Porous Media Flows using Finite Volume Method on Unstructured Meshes using Open Source Finite Volume Platform OpenFOAM. *Engineering Applications of Computational Fluid Dynamics*, 7(2): 223-238.

46. A.W. Nielsen, *X. Liu*, B.M. Sumer, J. Fredsøe (2013). Flow and Bed Shear Stresses in Scour Protections around a Pile in a Current, *Coastal Engineering*, 72:20-38.

47. S. Sinha, *X. Liu*, and M.H. García (2012). Three-dimensional Hydrodynamic Modeling of the Chicago River, Illinois, *Environmental Fluid Mechanics*, 12(5):471-494

48. *X. Liu*, G. Parker, J. Czuba, K. Oberg, J.M. Mier, J.L. Best, D.R. Parsons, P. Ashmore, and M.H. García (2011). Sediment Mobility and Bed Armoring in the St. Clair River: Insights from Hydrodynamic Modeling. *Earth Surface Processes and Landform*, 37(9):957-970.

49. *X. Liu* (2011). Extension of Kleiser and Schumann's Influence-Matrix Method for Generalized Velocity Boundary, *Journal of Computational Physics*, 230(22):7911-7916.

50. *X. Liu* and M.H. García (2011). Computational Fluid Dynamics (CFD) Modeling for the Design of Large Primary Settling Tanks. *Journal of Hydraulic Engineering*, 137(3):343-355.

51. A.S. León, *X. Liu*, M.S. Ghidaoui, A.R. Schmidt and M.H. García (2010), Junction and Drop-Shaft Boundary Conditions for Modeling Free-Surface, Pressurized, and Mixed Free-Surface Pressurized Transient Flows, *Journal o f Hydraulic Engineering*,136(10):705-715.

52. *X. Liu* and M.H. García (2008). Coupled Two-Dimensional Model for Scour Based on Shallow Water Equations with Unstructured Mesh. *Coastal Engineering*. 55(10): 800-810.

53. *X. Liu* and M.H. García (2007). A 3D Numerical Model with Free Water Surface and Mesh Deformation for Local Sediment Scour. *Journal of Waterway, Port, Coastal, and Ocean Engineering*. 134(4): 203-217

54. *X. Liu* and M.H. García (2007). Discussion of "Divergence Form for Bed Slope Source Term in Shallow Water Equations" by A. Valiani and L. Begnudelli. *Journal of Hydraulic Engineering*. 134(5): 678-679.

55. *X. Liu* and M.H. García (2007). Numerical Investigation of Sea Bed Response under Waves with Free-surface Water Flow. *International Journal of Offshore and Polar Engineering*, 17(2), 97-104

56. *X. Liu*, J. Ni, and T. Li (2004). A Quadtree Based Method for Dynamic Partitioning Integrated Information Units with Different Scales and its Implementation. *Journal of Basic Science and Engineering*, 12(1): 24-32 (in Chinese)

Papers Submitted/in Preparation

1. S. A. M. Darzikolaeia, J. C. Curran, X. Liu. Experimental Study on Flow and Sediment Patterns around Porous Engineered Log Jams, JHE

2. A. M. Mazdeh and X. Liu. Is there mesh independence for 2D modeling based on shallow-water equations?

3. P. Chaemchuen, Y. Song, F. Rahmani, W. Zhi, L. Li, X. Liu, E. Boyer, T. Bindas, K. Lawson, C. Shen. Deep learning insights into suspended sediment concentrations across the conterminous United States: Strengths and limitations

4. X. Liu, Y. Song, and C. Shen. Bathymetry Inversion using a Deep-Learning-Based Surrogate for Shallow Water Equations Solvers. https://arxiv.org/abs/2203.02821, WRR, resubmitted.

5. Y. Song, C. Shen, X. Liu. Surrogate Model for Shallow Water Equations Solvers with Deep Learning. https://arxiv.org/abs/2112.10889

6. Y. Zeng, X. Liu, and D. L. Smith. ELAM-OF: An Eulerian-Lagrangian Agent Model (ELAM) for Fish Passage Designs Implemented with OpenFOAM

7. Y. Zeng, X. Liu, and D. L. Smith. Evaluation of Fish Migration and Fish Passage Design using Two-dimensional Hydraulics Models and Eulerian-Lagrangian Agent Models

8. X. Liu. pyHMT2D: Python-based two-dimensional hydraulic modeling tools.

9. Z. Li, X. Liu, G. Fourtakas, N. Stark, and T. Qiu. Dynamics of coupled fluid-object-sediment systems with smoothed particle hydrodynamics (SPH) simulations, Acta Geotechnica.

10. B. Li, M. B. Cardenas, X. Chen, and X. Liu. Mechanistic definition and prediction of the mass transfer coefficient between rivers and hyporheic zones.

11. A. B. Turețcaia, B. Li, P. C. Bennett, M. H. Kaufman, X. Chen, X. Liu, J. Stegen, and M. B. Cardenas. Instream and Hyporheic Zone Contributions to River Corridor Oxygen and CO2 Dynamics Due to Episodic Particulate Organic Matter Additions.

12. B. Li, M. B. Cardenas, X. Chen, and X. Liu$. Flow and transport in heterogeneous hyporheic zones with cross-bedded sediments.

Non-Peer-Reviewed Publications

1. J. Zhang, *X. Liu*, A. Tejada-Martinez, and Q. Zhang. (2016). Computational Fluid Dynamics: A promising tool for analysis and design of water and wastewater treatment, *Hydrolink Magazine*, IAHR, Year 2016, Number 2, pages 39-41

Book chapters

1. M. J. Franca, D. Valero, and *X. Liu* (2021). Turbulence and rivers. In Treatise in Geomorphology, 2nd edition, editor Ellen Wohl. Elsevier. https://doi.org/10.1016/B978-0-12-818234-5.00135-8

2. *X. Liu*, (2019). Introduction. in Computational Fluid Dynamics Applications in Water, Wastewater, and Stormwater Treatment. ASCE.

3. *X. Liu*, (2019). Chapter 1. Physical Processes. in Computational Fluid Dynamics Applications in Water, Wastewater, and Stormwater Treatment. ASCE.

4. *X. Liu*, (2019). Chapter 4.Overview of Computational Fluid Dynamics. in Computational Fluid Dynamics Applications in Water, Wastewater, and Stormwater Treatment. ASCE.

5. *X. Liu*, (2019). Chapter 11. Sedimentation. in Computational Fluid Dynamics Applications in Water, Wastewater, and Stormwater Treatment. ASCE.

6. *X. Liu*, Open channel hydraulics: From them to now and beyond, in *Modern Water Resources Engineering*, Humana Press, 2014

Books

1. *X. Liu* (2020-). Computing in Civil and Environmental Engineering. GitHub Repository, https://github.com/psu-efd/Computing-in-CEE, DOI: 10.5281/zenodo.3996772 (This is a living book; it will keep evolving)

2. J. Rice, *X. Liu*, I. Sasanakul, M. Mcllroy, M. Xiao (2021). Proceedings of the 10th International Conference on Scour and Erosion (ICSE-10). International Society of Soil Mechanics and Geotechnical Engineering, Geo-Institute of American Society of Civil Engineering.

3. *X. Liu* and J. Zhang (editors). Computational Fluid Dynamics Applications in Water, Wastewater, and Stormwater Treatment. ASCE, 2019.

Selected Conference Papers

1. *X. Liu* and Y. Xu. An immersed boundary wall function for smooth wall shear stress, The 13th OpenFOAM Workshop, Shanghai, China, 2018

2. *X. Liu* and Y. Xu. Scour modeling around hydraulic structures with complex geometries, International Conference on Sedimentation and Erosion, Taiwan, 2018

3. T. Nagel, J. Chauchat, Z. Cheng, C. Bonamy, *X. Liu*, T. Hsu, & O. Bertrand. (2017). Two-phase Flow Simulations of Scour around a Cylindrical Pile. Coastal Dynamics 2017.

4. B. Jensen, *X. Liu*, E. D., Christensen. (2017). Porous Media and Immersed Boundary Hybrid-Modelling for Simulating Flow in Stone Cover-Layers. Coastal Dynamics 2017.

5. R. A. DiBiase, *X. Liu*, Y. Chen, A. B. Neely, and N. R. McCarroll. Rapid characterization of streambed microtopography in mountain channels: Methods and application using structure from motion photogrammetry. GSA Meeting 2017.

6. K. Chen, Y, Chen, Y, You, *X. Liu*, T. Hu, and W. Li, Computational Modeling of the Evolution of Submerged Laminar Round Jet in Shallow Water, International Ocean and Polar Engineering Conference, Hawaii, USA, 2015

7. M. Nayamatullah, and *X. Liu*, Analytical Solutions for Unsteady Two-Dimensional Suspended Sediment Transport in Open Channel with Variable Eddy Viscosity Distributions, ASCE EWRI, 2014

8. *X. Liu*, An Innovative Computational Approach for the Hydrodynamics around Large Woody Debris with Arbitrary Geometrical Shapes, ASCE, EWRI, 2014

9. Z. Zhou, T. Hsu, F. C. K. Ting , and *X. Liu* The effects of wave-breaking-induced turbulence on bottom stress and suspended sediment transport - A 3D numerical study, the 34th International Conference on Coastal Engineering, Soeul, Korea, 2014

10. *X. Liu*, Realistic Flow Simulations around and inside Porous Scour Protections, IAHR, Chengdu, China, 2013

11. *X. Liu*, D. Liu, H. Ma, M. Nayamatullah, X. Fu, Near-Wall Treatment for Suspended Sediment in Boundary-Layer Resolving Numerical Models, IAHR, Chengdu, China, 2013

12. *X. Liu*, M. Nayamatullah, Analytical solutions for the suspended sediment transport in channels using Generalized Integral Transform Technique (GITT), ASCE EWRI 2013

13. R. Ashraf, *X. Liu*, Channel instability predictions and their impact on transportation infrastructures: Case study for five rivers in Texas, ASCE EWRI 2013

14. *X. Liu*, Y. Jiang, and R. Sinir, Simulation of flow field around and inside porous scour protection with physical and realistic particle configurations from computer graphics, Computational Methods in Water Resources XIX International Conference, Champaign, IL, 2012

15. Y.Jiang, *X. Liu*, and R. Sinir, Computational Modeling of Density Current over Rough and Uneven Bottoms, Computational Methods in Water Resources XIX International Conference, Champaign, IL, 2012

16. R. Sinir, *X. Liu* and Y. Jiang, Computer generated particle arrangement for pore scale modeling, Computational Methods in Water Resources XIX International Conference, Champaign, IL, 2012

17. Y. Jiang and *X. Liu*, Numerical and experimental investigation of density current over bedforms and rough bottom, The Third International Symposium on Shallow Flows, Iowa City, Iowa, USA, 2012

18. *X. Liu*, S. Sinha, D. Motta, M.H. Garcia, Density current caused by CSO events in Bubbly Creek, Chicago, Illinois, The Third International Symposium on Shallow Flows, Iowa City, Iowa, USA, 2012

19. *X. Liu*, Direct numerical simulation of boundary condition effects on the propagation of density current in a channel, In the proceedings of RCEM2011: River, Coastal and Estuarine Morphodynamics, Beijing, China, 2011

20. S. Sinha, *X. Liu* and M. H. García. Three dimensional hydrodynamic and water quality modeling of a CSO (combined sewer overflow) event in Bubbly Creek, Chicago, IL. In the proceedings of Riverflow, 2010, Braunshweig, Germany. (peer-reviewed)

21. S. Dutta, Y. Catano, *X. Liu*, and M. H. García. Computational Fluid Dynamics (CFD) Modeling of Flow into the Aerated Grit Chamber of the MWRD's North Side Water Reclamation Plant, Illinois. In Proceedings of ASCE EWRI World Environmental & Water Resource Congress, Providence, Rhode Island, USA, 2010

22. *X. Liu*, G. Parker, and M.H. García. Numerical Modeling of the St. Clair River and Sediment Mobility Analysis. In Proceedings of ASCE EWRI World Environmental & Water Resource Congress, Providence, Rhode Island, USA, 2010

23. P. Ashmore, J. Best, J. Czuba, J. Denny, D. Foster, K. Oberg, M. H. Garcia, *X. Liu*, G. Parker, D. Parsons. Morphology, sedimentology and dynamics of the upper St. Clair River. In Proceedings of the 53rd International Conference on Great Lakes Research, Toronto, Canada, 2010

24. M. Qi, *X. Liu*, M.H. García, and P. Jiang. Channel Degradation in the Yangtze River due to Decreased Sediment Supply. In Proceedings of 33rd IAHR Congress, Vancouver, Canada, 2009

25. *X. Liu*, S. Sinha, N.A. Sobh and M.H. García. Three-Dimensional Water Quality Modeling of the Chicago River, IL. In Proceedings of 2009 UCOWR/NIWR Annual Conference, Chicago, USA, 2009

26. ***X. Liu***, S. Sinha, D. Motta, and M.H. García. Upstream Intrusion Effect of CSO Event in Bubbly Creek, IL. In Proceedings of ASCE EWRI World Environmental & Water Resource Congress, Kansas City, Missouri, USA, 2009

27. A.S. León, ***X. Liu***, M.S. Ghidaoui, A.R. Schmidt and M.H. García, Boundary Conditions for Simulating Complex Storm-sewer Systems in Free Surface, Pressurized, and Mixed Flow Conditions. In Proceedings of ASCE EWRI World Environmental & Water Resource Congress, Kansas City, Missouri, USA, 2009

28. D. Motta, J.D. Abad, ***X. Liu***, and M.H. García. Two-dimensional BOD and DO Water Quality Model for Engineering Applications: the Case of Bubbly Creek in Chicago, Illinois. In Proceedings of ASCE EWRI World Environmental & Water Resource Congress, Kansas City, Missouri, USA, 2009

29. A.S. León, Y.A. Cataňo-Lopera, ***X. Liu***, A.R. Schmidt and M.H. García, Experimental and CFD Modeling of a Vortex Flow Restrictor, In proceedings of World Environmental & Water Resource Congress, Honolulu, Hawaii, 2008

30. ***X. Liu*** and M.H. García, Optimal Design of the Chicago Calumet Water Reclamation Plant (CCWRP) Primary Settling Tanks with 3D Numerical Models, In proceedings of World Environmental & Water Resource Congress, Honolulu, Hawaii, 2008

31. ***X. Liu*** and M.H. García, Numerical Simulations of Density Current in Chicago River Using Environmental Fluid Dynamics Code (EFDC), In proceedings of World Environmental & Water Resource Congress, Honolulu, Hawaii, 2008

32. C. Brunner, E. Brosius, E. Podczerwinski, M.H. García and ***X. Liu***, Computational Fluid Dynamics (CFD) Modeling and Optimal Design of Primary Settling Tanks at Calumet, Chicago, In proceedings of Water Environment Federation's Annual Technical Exhibition and Conference, Chicago, IL, 2008

33. C. Brunner, E. Brosius, E. Podczerwinski, M.H. García and ***X. Liu***, Optimizing the Design of Primary Settling Tanks Using CFD Modeling, In proceeding of IWEA 29th Annual Conference and Exhibition, Peoria, IL, 2008

34. ***X. Liu*** and M.H. García. Coupled Model of Shallow Water Equations and Sediment Transport on Unstructured Mesh. In proceeding of the Fifth International Symposium on Environmental Hydraulics, Tempe, Arizona, 2007

35. ***X. Liu*** and M.H. García. Numerical Simulation of Rectangular Settling Tank with Scraper Using Dynamic Mesh. In proceeding of the Fifth International Symposium on Environmental Hydraulics, Tempe, Arizona, 2007

36. ***X. Liu*** and M.H. García. Numerical Simulation of sea bed response under waves with coupled solver of Biot consolidation equations and free surface water flow. In proceeding of ISOPE PACOMS, Dalian, China, 2006 (peer-reviewed)

37. ***X. Liu*** and M.H. García, Numerical Simulation of Local Scour with Free Surface and Automatic Mesh Deformation, In proceeding of World Environmental & Water Resource Congress, Omaha, NE, 2006

Conference Abstracts and Posters

1   *X. Liu* (2018, invited talk). Coupled LES-DEM simulations of particle saltation, the 8th International Symposium on Environmental Hydraulics, University of Notre Dame, IN

2   Y. Zeng, Y. Xu, and *X. Liu* (2018). An Eulerian-Lagrangian agent model (ELAM) for fish passage designs, the 8th International Symposium on Environmental Hydraulics, University of Notre Dame, IN

3   Z. Li, *X. Liu*, and T. Qiu (2018). Smoothed particle hydrodynamics modeling of the motion of a cylinder on a saturated granular sediment box under cyclic hydrodynamic loading, the 8th International Symposium on Environmental Hydraulics, University of Notre Dame, IN

4   *X. Liu* (2018). ASCE EWRI task committee: CFD applications in water, wastewater, and stormwater treatment. ASCE EWRI Congress 2018, Minneapolis, MN

5   Y. Xu and *X. Liu* (2018). 3D numerical simulation of local morphodynamics around complex in-stream structures. ASCE EWRI Congress 2018, Minneapolis, MN

6   Y. Chen, *X. Liu*, and K. D., Mankoff (2018). Glacial plumbing: Flow resistance in a real subglacial conduit. Penn State Institute of CyberScience Symposium 2018.

7   *X. Liu* (2013, invited talk). Modeling of hydrological and hydraulics problems using OpenFOAM® platform: From physics to mathematical models to computer codes, AGU Fall Meeting, San Francisco, CA

8   X. Liu (2013). A hybrid computational approach for the interactions between river flow and porous sediment bed covered with large roughness elements, AGU Fall Meeting, San Francisco, CA

9   M. Nayamatullah and *X. Liu* (2013). Large Eddy Simulations of Suspended Sediment Transport over Bedforms with a New Boundary Treatment, AGU Fall Meeting, San Francisco, CA

10   Z. Zhou, *X. Liu*, T. Hsu, and J. Sangermano (2013). The effects of breaking wave turbulence on suspended sand transport in the nearshore - a 3D numerical investigation, AGU Fall Meeting, San Francisco, CA

11   *X. Liu* (2013). Flow penetration into porous scour protection layers: A hybrid approach for a multidimensional and multiscale problem, ASCE EWRI 2013

12   *X. Liu*, Y. Jiang (2012). Density current over rough and uneven bottoms, AGU Fall Meeting, San Francisco, CA

13   *X. Liu* (2012). Simulation of fluid flow field around and inside porous structure with physical and realistic particle configurations, San Antonio Simulations and Visualization Symposium, San Antonio, Texas.

14   M. Nayamatullah and *X. Liu* (2012). Analytical solutions for suspended sediment transport in channels using Generalized Integral Transform Technique (GITT), San Antonio Simulations and Visualization Symposium, San Antonio, Texas.

15   *X. Liu*, A.W. Nielsen, and B. M. Sumer (2012). Flow simulations and scour implications around a pile with porous protection. ASCE EWRI, New Mexico.

16   *X. Liu* (2011), Fruitful modeling and research efforts by the environmental fluid mechanics group using OpenFOAM at University of Texas at San Antonio, TX, 6th OpenFOAM workshop, PennState University, USA, June, 2011

17   *X. Liu* (2010), Generalized velocity boundary conditions for Kleiser and Schumann's influence-matrix method. 63rd Annual APS DFD meeting, Long Beach, California, November, 2010

18   *X. Liu* (2010). Investigation of boundary condition effects on the propagation of density current using direct numerical simulations. AGU Fall meeting, San Francisco, December, 2010

Technology Transferred or Adapted in the Field

Liu, X. "An improved version of a computational model for non-physical fish barrier," U.S. Army Corps of Engineers. Completed. (2016).
We upgraded and improved a US Army Corps of Engineers model for non-physical fish barrier, including bubble curtain, low-frequency sound, and LED modulated intensity lights. Specifically, we rectified some model bugs and ported the code into the latest version of the open source CFD package OpenFOAM.

Liu, X. (Developer), "Automatic mesh generation for complex geometries," U.S. Bureau of Reclamation. Completed. (2016).
We modified the open source CFD package OpenFOAM's mesh generation tool named snappyHexMesh for easy use in river engineering. The tool was then ported into Windows environment for USBR engineers.

A MS Excel spreadsheet with embedded VBA code for pre-processing the mesh input file was also delivered.

Liu, X. (Developer), "Parallelized version of SRH-2D model," U.S. Bureau of Reclamation. Completed. (2016).
We parallelized the USBR model SRH-2D using MPI. SRH-2D is a widely used hydrodynamic and sediment transport model by federal and state agencies, as well as industry.

Invited Talks

1.   University of Buffalo. "Physics-Based and Data-Driven Modeling in Environmental Hydraulics", 2023

2.   FHWA Hydraulics Lab, "3D Scour Modeling for Engineering Practice – Current Status and Future R&D Needs", 2022

3.   USACE ERDC, Vicksburg, MS, "Physics-Based and Data-Driven Modeling in Environmental Hydraulics." 2022

4.   ETH Zurich, "Ecohydraulics Modeling for River Restoration." 2022.

5.   Karlsruhe Institute of Technology. "Physics-Based and Data-Driven Modeling in Environmental Hydraulics", 2022

6.   Clarkson University, "Hydraulics and performance evaluations of fish passages based on CFD and individual-based methods", 2022

7.   Red Yaku, Peru, "Building computer models like Legos: Dynamics and prediction of coupled fluid-

object-sediment systems", 2021

8.   Saint Francis University, "Computational Modeling: A Tool for Water and Environmental Research", 2020

9.   Virginia Tech, "Dynamics and prediction of coupled fluid-object-sediment systems", 2019

10.   Penn State Environmental Engineering Seminar, "Computational modeling: a tool for water and environmental research", 2019

11.   Liu, X. (2018). "Coupled LES-DEM Simulations of Particle Saltation", The 8th International Symposium on Environmental Hydraulics.

12.   Liu, X. (2017). "Computational Hydraulics with OpenFOAM," Hohai University, China.

13.   Liu, X. (2016). "Model Development and Applications for the Drainage of Permeable Road Pavement," University of Texas at San Antonio.

14.   Liu, X. (2016). "Computational Hydraulics with OpenFOAM," Wuhan University, China.

15.   Liu, X. (Presenter & Author), (August 2015). "Computational Modeling of Surface and Internal Erosion," U.S. Army Corp of Engineers, Vicksburg, MS, Invited. National.

16.   Liu, X., (July 2015). "Roadway Hydraulics Simulations with OpenFOAM," California Department of Transportation.

17.   Computational modeling of free surface flows around arbitrary objects: Applications for environmental hydraulics, Cornell University, USA, 2014

18.   Immersed boundary method for free surface flows around arbitrary objects using OpenFOAM: Applications for environmental hydraulics, Fluid Dynamics Research Consortium, Penn State University, USA, 2014

19.   Flow Penetration into Porous Hydraulic Structures: A New Computational Approach for an Old Multi-scale Problem, University of Delaware, USA, 2013

20.   Flow Penetration into Porous Hydraulic Structures: A New Computational Approach for an Old Multi-scale Problem, LSU, USA, 2013

21.   Density Current over Rough and Uneven Bottoms, Department of Civil and Environmental Engineering, TAMU, USA, 2013

22.   Simulation of Flow Field Around and Inside Scour Protection with Physical and Realistic Particle Configurations, Technical University of Denmark (DTU) and Danish Hydraulic Institute (DHI), Denmark, 2012

23.   Generalized Kleiser and Schumann's Influence-Matrix Method for Direct Numerical Simulations of Turbulent Flows, National Microgravity Laboratory, Institute of Mechanics, Chinese Academy of Sciences, Beijing, China, 2012

24.	How can Angry Birds© save the world? Current research in the environmental fluid dynamics group at UTSA, Department of Civil and Environmental Engineering, University of Houston, USA, 2012

25.	DNS Simulations of Density Current using Generalized Kleiser and Schumann's Influence-Matrix Method, Department of Civil and Environmental Engineering, TAMU, USA, 2011

26.	Generalized Kleiser and Schumann's Influence-Matrix Method for Direct Numerical Simulations of Turbulent Flows, Department of Mechanical Engineering, UTSA, USA, 2010

27.	Generalized Velocity Boundary Conditions and "tau" Error Corrections for Kleiser and Schumann's Influence-Matrix Method, Department of Civil and Environmental Engineering, UTSA, USA, 2010

28.	Modeling of Sediment Transport and Porous Medium Response under Currents and Waves, UT Austin, USA, 2010

29.	Numerical Models for Scour around Object under Currents and Waves, Argonne National Lab, Chicago, USA, 2009

30.	Local Scour and Liquefaction around Objects under Currents and Waves, University of Texas at San Antonio, USA, 2009

31.	Environmental Multiphase Flow Modeling, Pacific Northwest National Lab, USA, 2009

32.	Computational Modeling of Environmental Hydraulics, Queen's University at Belfast, UK, 2009

33.	Modeling of Sediment Transport and Porous Medium Response Under Current and Waves, Tsinghua University, P.R. China, 2009

34.	Multiphase flow in environmental hydraulics: sediment transport, settling tanks, water quality and more. University of Illinois at Urbana-Champaign, USA, 2006

35.	Local Scour and Liquefaction around Objects under Waves, University of Illinois at Urbana-Champaign, USA, 2006

Service to the University, Society, and the Professor

Service to the University
Department
Penn Statte CEE Water area coordinator, Coordinator. (August 2017 - Present).
Task force for undergraduate numerical method course, Member. (August 2016 - Present).
Graduate committee, Committee Member. (August 2015 - August 2017).
   Graduate handbook revision, scholarship and fellowship decisions, degree programs, etc.
Search committee for faculty in geotech, Committee Member. (July 2016 - March 2017).
Water ethics position search committee, Committee Member. (September 2015 - May 2016).
   Search committee for a new position on water ethics.
Water resources engineering position search committee, Committee Member. (August 2015 - May 2016).
   Search committee for a new position on stormwater management.
Water group coordinator, Group Coordination and Advisory Committee, Committee Member. (June 1, 2014 - May 31, 2015).
Committee member, CEE department head search committee, Committee Member. (September 8, 2014 - May 1, 2015).

Serve on the committee for the search of new CEE department head.
Finalized candidates and waiting for their campus interview.

College
College of Engineering Graduate Council, Alternative Member. (2023-2026)

Research Computing Committee, Committee Member. (January 2016 - May 2017).
Deal with matters of importance to the research computing community within COE.
Developed governance plan to include a leadership structure, membership selection, terms of office, etc.

University
Penn State Data Science Community, co-chair. 2020

Subcommittee for Institute of CyberScience Affiliates and Associates Program, Institute of CyberScience, Committee Member. (February 2017 - May 2017).
To create a formal program for recognizing researchers as ICS "Affiliates" and "Associates", replacing the informal system currently in place.

Judge for the 2018 Penn State Institute of Cyberscience Symposium, March, 2018
Campus
Penn State Fluid Dynamics Research Consortium Seminar Series, Organizer. (August 2015 - December 2015).
Organize and coordinate weekly seminar series on fluid dynamics with speakers from outside and on campus.

Assistance to Student Organizations
College
Judge for the 15h Annual College of Engineering Research Symposium. (February 2018 - April 2018).
Judge for the 14h Annual College of Engineering Research Symposium. (February 2017 - April 2017).
Volunteered as judge for graduate student posters and reviewed their papers.
Judge for the 13th Annual College of Engineering Research Symposium. (June 1, 2016 - June 30, 2016).
Volunteered as judge for graduate student posters and reviewed their papers.
Judge for the 12th Annual College of Engineering Research Symposium, Judge. (June 1, 2015 - June 30, 2015).
Volunteered as judge for graduate student posters and reviewed their papers.

Service to the Disciplines and to the Profession
Cyberinformatics and Numerics Working Group of the Community Surface Dynamics Modeling System (CSDMS) funded by NSF, Science Steering Committee, Committee Member. (2017 - Present).
ASCE Sedimentation Committee, Committee Member, Elected, International. (May 1, 2010 - Present).
ASCE Computational Hydraulics Committee, Committee Member, Elected, International. (May 1, 2006 - Present).
International Scientific Committee, the 9th Symposium on River, Coastal and Estuarine

Morphodynamics, RCEM, Committee Member, International. (January 2015 - December 2015).

AGU Fall Meeting Session, Co-Chairperson. New Orleans, LA. (2017 - Present).

Cyberinformatics and Numerics Working Group of the Community Surface Dynamics Modeling System (CSDMS) funded by NSF, Science Steering Committee, Committee Member. (2017 - Present).

AGU Fall Meeting Session, Co-Chairperson. San Francisco, CA. (2016 - Present).

Session organizer, AGU 2016, Co-Chairperson. San Francisco, CA. (2016).

Volunteer judge for the Outstanding Student Presentation Award, Volunteer. San Francisco, CA. (2016).

Judged 5 student posters at AGU 2016 Fall Meeting.

Chair for session, River Flow 2016 conference, Chairperson. St. Louis, MO. (July 1, 2016 - July 31, 2016).

Volunteer judge for the Outstanding Student Presentation Award, AGU, Volunteer, International. San Francisco, CA. (December 2015).

Judged 10 student posters at AGU 2015 Fall Meeting.

Coordinator of the Outstanding Student Presentation Award, AGU, Coordinator, International. San Francisco, CA. (September 2015 - December 2015).

As a coordinator, my responsibilities include communicating with the president, session chairs, voluntary judges, and students; assignment judge slots; selection of award winners

First annual workshop of Oregon State Natural Hazards Engineering Research Infrastructure Workshop, Participant, International. (October 2015).

Participated in the discussion of the NSF workshop and contributed to the research directions.