

XILIN XIA

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Xilin Xia is a lecturer working on computational modelling of natural hazards and their impacts. His research interests cover computational hydraulics, high-performance computing, machine learning and their applications in modelling and understanding hydraulic, hydrological, and geotechnical processes in both natural and urban environments. His research vision is to develop advanced and holistic modelling technologies to facilitate the risk management of extreme weather induced hazards and enhance resilience of infrastructure.

EMPLOYMENT

05/2018 – 05/2022 **Lecturer in Water Engineering**, School of Architecture, Building and Civil Engineering, Loughborough University

11/2016 – 05/2018 **Research Assistant/Associate**, School of Engineering, Newcastle University

Worked on three NERC-funded projects:

Susceptibility of catchments to INTense RAInfall and flooding (SINATRA)

Towards END-to End flood forecasting and a tool for ReaL-time catchment susceptibility (TENDERLY)

REMATCH: Building REsilience to Multi-source Flooding in Southeast/South Asia through a Technology-informed Community-based approach

EDUCATION AND CERTIFICATES

07/2021 – present **Fellow of Higher Education Academy**

09/2012 – 05/2017 **PhD in Water Resources**, Newcastle University, UK

This title: High-Performance simulation technologies for water-related natural hazards

09/2010 – 06/2012 **MEng in Road and Railway Engineering**, Wuhan University, China

09/2006 – 06/2010 **BEng in Civil Engineering**, Wuhan University, China

HONOURS AND AWARDS

08/2017 **Promising Young Scientist**, The 15th International Symposium on Geo-disaster Reduction, Chengdu, Shimane and Kyoto, Japan

04/2017 **Featured Article**, Water Resources Research

10/2016 **Outstanding Young Researcher**, The 14th International Symposium on Geo-disaster Reduction, Chengdu, China

03/2016 **Scholarship**, Henry Lester Trust

06/2015 **Scholarship**, Great-Britain China Centre Educational Trust

2012 – 2015 **PhD Scholarship**, Newcastle University

07/2012 **Excellent MEng dissertation**, Wuhan University

07/2010 **Excellent BEng dissertation**, Wuhan University

EXTERNAL PROFESSIONAL ACTIVITIES

06/2021 Giving an **invited talk** at Wuhan University, China

02/2021	Giving an invited talk at Technische Universität Berlin
11/2020	Giving an invited talk at the University of Edinburgh
2019 – 2020	Co-editing a special issue on shallow water flow modelling in <i>Advances in Water Resources</i>
08/2019	Giving a keynote talk in the UK-China Researcher Links Workshop on Hydro-geohazards and Urban Resilience
11/2018	Disseminating research outputs of FFIR project at Royal Society
2018	Convenor , The 13 th International Hydroinformatics Conference (HIC)
2017	Session Chair , The 37 th IAHR World Congress
2017	Session Chair , The 15 th International Symposium on Geo-disaster Reduction
2017 – present	Editor , <i>Geoenvironmental Disaster</i>
2015 – 2017	Invited talks at Sun Yat-Sen University and Hohai University
2016 – present	Invited Reviewer , for ‘ <i>Journal of Hydraulic Research</i> ’, ‘ <i>Advances in Water Resources</i> ’, ‘ <i>Journal of Hydrology</i> ’, ‘ <i>ICE – Water Management</i> ’, ‘ <i>Water Science and Engineering</i> ’, ‘ <i>Journal of Hydroinformatics</i> ’, ‘ <i>Journal of Hydrodynamics</i> ’, ‘ <i>Computational Methods and Applications in Mechanics and Engineering</i> ’, ‘ <i>Science of Total Environment</i> ’, ‘ <i>Quarterly Journal of Engineering Geology</i> ’, ‘ <i>Water Resources Research</i> ’, ‘ <i>Journal of Geophysical Research: Earth Surface</i> ’, ‘ <i>Ocean Engineering</i> ’, ‘ <i>Computers and Geosciences</i> ’, ‘ <i>Natural Hazards</i> ’.

CONTRIBUTIONS TO TEACHING

At Loughborough University:

2020 – 2022	Module leader of Flooding Modelling and Management (PGT)
2019 – 2022	Module leader of Sustainable Flood Management (Part D) and Civil Engineering Field Course (Part B)
2018 – 2022	Module leader of Integrated Water Resources Management (PGT)
2018 – 2022	Contributing to Water and Natural Environment (PGT)

CONTRIBUTIONS TO ADMINISTRATION

At Loughborough University:

2020 – 2022	Part D Year Tutor for Civil Engineering
2019 – 2022	Member of internal review panel for NERC standard grants
2018 – 2022	Convenor of Water Seminar Series
2018 – 2022	Member of HPC Stakeholder Sub-committee

RESEARCH GRANTS

2021 – 2022	ENACT: Evaluating the feasibility and efficacy of integrated catchment-scale Nature-based solutions for Climate Change adaptation in India, Co-I , NERC
2021 – 2022	Building a Flood Hazard Impact Model for India (FHIM-India) Phase 2, Newton Fund through UK Met Office, Loughborough PI (Total value £75446, value to LU £18196), P109479
2020 – 2022	Beyond the networked city: building innovative delivery systems for water, sanitation and energy in urban Africa, ESRC, Co-I (Total value £1.73M, value to LU £355330), ES/T007656/1
2019 – 2021	WCSSP India – Lot 7, Building a Flood Hazard Impact Model for India (FHIM-India), Newton Fund through UK Met Office, Loughborough PI (Total value £568251, value to LU £184010), P106860

2018 – 2019	Newton Fund Researcher Links Workshop Grant: Hydro-geohazards and Resilient Urban Growth, British Council, Co-I (value to LU £24000), 2018-RLWK10-10625
2019 – 2020	IAS water theme, Loughborough University, Co-Lead (Total value £38000)
2019 – 2020	FUTURE-DRAINAGE: Ensemble climate change rainfall estimates for sustainable drainage, NERC, Co-I (value to LU £107470), NE/S016678/1
2019 – 2021	River basins as ‘living laboratories’ for achieving sustainable development goals across national and sub-national scales, NERC, Co-I (Total value £319389, value to LU £129548), NE/S012427/1

GRANTS UNDER REVIEW

2021 – 2022	CMMI-EPSRC - Serious Play and Communication Environment for Resilience (SPaCE-R), EPSRC, Co-I , (Value to LU, £453890)
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PhD STUDENTS

2016 – present	Miss Qian Li (2 nd supervisor)
2017 – present	Mrs Jinghua Jiang (2 nd supervisor)
2019 – present	Miss Kristine Jarsve (1 st supervisor)
2019 – present	Mr Haoyang Qin (2 nd supervisor)
2017 – 2022	Miss Xiaoli Su (2 nd supervisor), graduated

RESEARCH ASSOCIATES

2019 – 2021	Dr Syed Kabir (now at JBA Risk)
2021 – present	Mrs Jinghua Jiang

VISITING ACADEMICS AND STUDENTS

2019 – 2020	Dr Weihua Zhao (from Chengdu University of Technology, China)
2020 – 2020	Mr Wei Shen (from University of Bologna, Italy)

PUBLICATIONS (H-index = 15, Google Scholar 07/04/2022)

Journal Publications:

- [1] X. Ming, Q. Liang, R. Dawson, **X. Xia**, J. Hou (2022), A quantitative multi-hazard risk assessment framework for compound flooding considering hazard inter-dependencies and interactions, *Journal of Hydrology*, 607, 127477.
- [2] X. Zhou, M. Moinuddin, F. Renaud, B. Barrett, J. Xu, Q. Liang, J. Zhao, **X. Xia**, L. Boshier, S. Huang, T. Hoey (2022), Development of an SDG interlinkages analysis model at the river basin scale: a case study in the Luanhe River Basin, China, *Sustainability Science*, doi: 10.1007/s11625-021-01065-z
- [3] X. Su, **X. Xia**, Q. Liang, J. Hou (2022), A coupled discrete element and depth-averaged model for dynamic simulation of flow-like landslides, *Computers and Geotechnics*, 141, 104537.
- [4] J. Zhao, H. Chen, Q. Liang, **X. Xia**, J. Xu, T. Hoey, B. Barrett, F. Renaud, L. Boshier, X. Zhou (2021), Large-scale flood risk assessment under different development strategies: the Luanhe River Basin in China, *Sustainability Science*, doi: 10.1007/s11625-021-01034-6
- [5] W. Zhao, **X. Xia**, X. Su, Q. Liang, X. Liu, N. Ju (2021), Movement process analysis of the high-speed long-runout Shuicheng landslide over 3-D complex terrain using a depth-averaged numerical model, *Landslides*, doi: 10.1007/s10346-021-01695-5 [SNIP=2.37]
- [6] I. Ozgen-Xian, **X. Xia**, Q. Liang, R. Hinkelmann, D. Liang, J. Hou (2021), Innovations towards the next generation of shallow flow models, *Advances in Water Resources*, 149, 103867 [SNIP=1.77]

- [7] J. Jiang, Q. Liang, **X. Xia**, J. Hou (2021), A coupled hydrodynamic and particle-tracking model for full-process simulation of nonpoint source pollutants, *Environmental Modelling and Software*, 136, 104951 [SNIP=2.09]
- [8] M. Zounemat-Kermani, E. Matta, A. Cominola, **X. Xia**, Q. Zhang, Q. Liang, R. Hinkelmann (2020), Neurocomputing in Surface Water Hydrology and Hydraulics: A Review of Two Decades Retrospective, Current Status and Future Prospects, *Journal of Hydrology*, 558, 125085 [SNIP=1.87]
- [9] L. Jiang, H. Yang, **X. Xia**, Q. Liang, S. Andrea, S.R. Kabir (2020), A Multi-Scale Mapping Approach based on a Deep Learning CNN Model for Reconstructing High-Resolution Urban DEMs, *Water*, 12, 1360, doi: 10.3390/w12051369 [SNIP=1.18]
- [10] S. Kabir, S. Patidar, **X. Xia**, Q. Liang, J. Neal, G. Pender (2020), A deep convolutional neural network for rapid fluvial flood inundation modelling, *Journal of Hydrology*, 590, 125481 [SNIP=1.87]
- [11] X. Ming, Q. Liang, **X. Xia**, D. Li, H. Fowler (2020), Real-time flood forecasting based on a high-performance 2D hydrodynamic model and numerical weather predictions, *Water Resources Research*, doi:10.1029/2019WR025583 [SNIP=1.71] **Top 10% most downloaded article
- [12] Q. Li, Q. Liang, **X. Xia** (2020), A novel 1D-2D coupled model for hydrodynamic simulation of flows in drainage networks, *Advances in Water Resources*, 137, 103519 [SNIP=1.77]
- [13] Y. Cui, Q. Liang, G. Wang, J. Zhao, H. Hu, Y. Wang, **X. Xia** (2019), Simulation of hydraulic structures in 2D high-resolution urban flood modelling, *Water*, 11, 2139 [SNIP=1.18]
- [14] **X. Xia**, Q. Liang, X. Ming (2019) A full-scale fluvial flood modelling framework based on a High-Performance Integrated hydrodynamic Modelling System (HiPIMS). *Advances in Water Resources*, doi: 10.1016/j.advwatres.2019.103392 [SNIP=1.77]
- [15] D.L.A. Flack, C.J. Skinner, L. Hawkness-Smith, G. O'Donnell, R.J. Thompson, J.A. Waller, A.S. Chen, J. Moloney, C. Largeton, **X. Xia**, S. Blenkinsop, A.J. Champion, M.T. Perks, N. Quinn, L.J. Speight (2019) Recommendations for Improving Integration in National End-to-End Flood Forecasting Systems: An Overview of the FFIR (Flooding From Intense Rainfall) Programme. *Water*, 11, 725. [SNIP=1.18]
- [16] Y. Xing, Q. Liang, G. Wang, X. Ming, **X. Xia** (2018) City-scale hydrodynamic modelling of urban flash floods: the issues of scale and resolution. *Natural Hazards*, doi: doi.org/10.1007/s11069-018-3553-z [SNIP=1.41]
- [17] **X. Xia**, Q. Liang (2018) A new efficient implicit scheme for discretising the stiff friction terms in the shallow water equations. *Advances in Water Resources*, 117, 87-97. [SNIP=1.77]
- [18] **X. Xia**, Q. Liang (2018) A new depth-averaged model for flow-like landslides over complex terrain with curvatures and steep slopes. *Engineering Geology*, 234, 174-191. [SNIP=2.86]
- [19] **X. Xia**, Q. Liang, X. Ming, J. Hou (2018) Reply to Comment by Lu et al. on "An efficient and stable hydrodynamic model with novel source term discretization schemes for overland flow and flood simulations". *Water Resources Research*, 54, 628-630. [SNIP=1.71]
- [20] **X. Xia**, Q. Liang, X. Ming, J. Hou (2017) An efficient and stable hydrodynamic model with novel source term discretization schemes for overland flow and flood simulations. *Water Resources Research*, 53, 3730-3759. [SNIP=1.71] **featured article of *Water Resource Research*
- [21] Q. Liang, L. Smith, **X. Xia** (2016) New prospects for computational hydraulics by leveraging high-performance heterogeneous computing techniques. *Journal of Hydrodynamics*, 28, 977-985. [SNIP=1.41]
- [22] Q. Liang, **X. Xia**, J. Hou (2016) Catchment-scale high-resolution flash flood simulation using the GPU-based technology. *Procedia Engineering*, 154, 975-981. [SNIP=1.44]

- [23] **X. Xia**, Q. Liang (2016) A GPU-accelerated smoothed particle hydrodynamics (SPH) model for the shallow water equations. *Environmental Modelling & Software*, 75, 28-43. [SNIP=2.09]
- [24] **X. Xia**, R. Huang, Q. Liang, B. Yu (2015) New physically-based simulation framework for analyzing the risk of flow-like landslides. *International Journal of Geohazards and Environment*, 1, 94-100.
- [25] Q. Liang, **X. Xia** (2015) Efficient urban flood simulation using a GPU accelerated SPH model. *Environmental Earth Science*, 74, 7285-7294. [SNIP=1.11]
- [26] Q. Liang, J. Hou, **X. Xia** (2015) Contradiction between the C-property and mass conservation in adaptive grid based shallow flow models: cause and solution. *International Journal for Numerical Methods in Fluids*, 78, 17-36. [SNIP=1.1]
- [27] J. Hou, Q. Liang, **X. Xia** (2015) Robust absorbing boundary conditions for shallow water flow models. *Environmental Earth Sciences*, 74, 7407-7422. [SNIP=1.11]
- [28] **X. Xia**, Q. Liang, M. Pastor, W. Zou, Y. Zhuang (2013) Balancing the source terms in a SPH model for solving the shallow water equations. *Advances in Water Resources*, 59, 25-38. [SNIP=1.77]

Book Chapters:

- [1] X. Su, **X. Xia**, Q. Liang, (2021) A Coupled Discrete Element and Depth-Averaged Model for Flow-Like Landslide Simulations. In: Tiwari B., Sassa K., Bobrowsky P.T., Takara K. (eds) *Understanding and Reducing Landslide Disaster Risk*. WLF 2020. ICL Contribution to Landslide Disaster Risk Reduction. Springer, Cham. https://doi.org/10.1007/978-3-030-60706-7_17

Conference Publications:

- [1] **X. Xia**, Q. Liang, X. Ming, (2018) High-Performance Integrated hydrodynamic Modelling of Storm Induced Floods at a Catchment Scale. *The 13th International Hydroinformatics Conference*, Palermo, Italy.
- [2] Q. Li, **X. Xia**, Q. Liang, W. Xiao, (2018) Drainage network modelling with a novel algorithm for junction calculation. *The 13th International Hydroinformatics Conference*, Palermo, Italy.
- [3] X. Ming, Q. Liang, **X. Xia**, (2018) Multi-source flood modelling with defence failure scenarios adaptive to various hydraulic conditions. *The 13th International Hydroinformatics Conference*, Palermo, Italy.
- [4] Q. Liang, Y. Xing, X. Ming, **X. Xia**, H. Chen, X. Tong, G. Wang (2017) An open-source modelling and data system for near real-time flood forecasting. *The 37th IAHR World Congress*, Kuala Lumpur, Malaysia.
- [5] **X. Xia**, Q. Liang (2015) A depth-integrated SPH model for flow-like landslides on fixed Cartesian coordinate system. *The 36th IAHR World Congress*, The Hague, The Netherlands.
- [6] **X. Xia**, Q. Liang (2015) A depth-integrated model for flow like landslides on fixed Cartesian coordinate system. *Advances in Numerical Modelling of Hydrodynamics 2015*, Sheffield, UK.
- [7] Q. Liang, **X. Xia**, J.H. Zheng (2014) A GPU Accelerated SPH Model for High-Resolution Dam-Break Simulations. *The 7th International Symposium on Environmental Hydraulics*, Singapore.
- [8] Q. Liang, **X. Xia** (2012) A Well-Balanced SPH Model for Shallow Flow over Topography. *The 3rd International Symposium on Shallow Flows*, Iowa City, Iowa, USA.