

Dr. Jihn-Sung Lai
(J.S. Lai)



Title: Professor/Research Fellow
Affiliation: Hydrotech Research Institute and
Department of Bioenvironmental
Systems Engineering, National
Taiwan University, Taipei 10617,
Taiwan.
Email: jslai525@ntu.edu.tw

Education

Ph.D. Department of Civil Engineering, University of California, Berkeley, USA, 1994.

M.S. Department of Civil Engineering, National Taiwan University (NTU), Taiwan, 1986.

B.S. Department of Civil Engineering, National Chungshin University, Taiwan, 1984.

Work Experience

- ♦ Adjunct Professor, Department of Bioenvironmental Systems Engineering, NTU, 2012- present;
- ♦ Executive Officer, Research Center for Climate Change and Sustainable Development, NTU, 2014- present;
- ♦ Executive Officer, Hydrometric Technology R&D Center, NTU, 2019- present;
- ♦ Head, Disaster-Prevention Project Division, Center for Weather Climate and Disaster Research, NTU, 2016- present;
- ♦ Research Fellow, Hydrotech Research Institute, NTU, 2009- present;
- ♦ Deputy Director General, Taiwan Typhoon and Flood Research Institute (TTFRI), National Applied Research Laboratories (NARL), 2016-2017.

Research Interests

- ♦ Reservoir sedimentation and management
- ♦ Fluvial/pluvial flood inundation simulation
- ♦ Scour/erosion, river hydraulics and sediment transport
- ♦ Hydrometric measurement, monitoring and sensing networks
- ♦ Disaster reduction and emergency responses

Awards

- ♦ The 2019 Journal Paper Award of Taiwan Agricultural Engineers Society.
- ♦ The 2019 Journal Paper Award of Taiwan Water Conservancy, Taiwan Joint Irrigation Society.
- ♦ The 2018 Agricultural Engineering Academic Award of the Taiwan Agricultural Engineers Society.
- ♦ The 2018 Best Engineer Paper Award of the Chinese Institute of Engineers.
- ♦ The 2018 Best Paper Award of the Chinese Institute of Civil and Hydraulic Engineering.
- ♦ The 2017 Best Paper Award of Workshop on Consumer Electronics.
- ♦ The 2016 Award of Disaster Prevention Technology Application, Taiwan Association of Disaster Prevention Industry, Taipei, Taiwan.
- ♦ The 2016 Best Paper Award of the Chinese Institute of Civil and Hydraulic Engineering.
- ♦ The 2015 Outstanding Contribution Award of Water Resources Agency, Ministry of Economic Affairs, Taiwan.

- ♦ The 2014 Best Paper Award of Journal of Disaster Management.
- ♦ The 2014 Journal Paper Award of the Taiwan Agricultural Engineers Society.
- ♦ The 2013 Journal Paper Award of the Taiwan Agricultural Engineers Society.
- ♦ The Outstanding Full Paper of 2012 IAHR-APD conference.
- ♦ The 2011 Best Engineer Paper Award of the Chinese Institute of Engineers.
- ♦ The 2011 Best Paper Award of the Chinese Institute of Civil and Hydraulic Engineering.
- ♦ The 2010 Journal Paper Award of the Society of Theoretical and Applied Mechanics of the Republic of China.
- ♦ The 2009 Best Paper Award of the International Conference on Computer and Network Technology in Education.
- ♦ The 2007 Journal Paper Award of Journal of the Chinese of Civil and Hydraulic Engineering.
- ♦ Industry-Academy Cooperation Award of Ministry of Education, Taiwan in 2003.
- ♦ Outstanding Engineer Award for engineering and technology of the Taichin Culture and Education Foundation in 2000.
- ♦ Scholarship of Ministry of Education, Taiwan for Ph.D. Degree Program in USA during 1990-1994.

Publications (Refereed Journal Papers, 1994-2019)

- (1) Y.B. Lin, T.K. Lin, C.C. Chang, C.W. Huang, B.T. Chen, J.S. Lai, K.C. Chang (2019) "Visible Light Communication System for Offshore Wind Turbine Foundation Scour Early Warning Monitoring," *Water* 11(7):1486. DOI: 10.3390/w11071486.
 - (2) H.Y. Liao, T.Y. Pan, H.K. Chang, C.T. Hsieh, J.S. Lai, Y.C. Tan, M.D. Su, (2019) "Using tabu search adjusted with urban sewer flood simulation to improve pluvial flood warning via rainfall thresholds," *Water*, 11(2):348. DOI: 10.3390/w11020348.
 - (3) C.C. Huang, Y.G. Lai, J.S. Lai, Y.C. Tan, (2019) "Case study: turbidity current in Shimen reservoir during typhoon events - A Field and numerical modeling study," *Journal of Hydraulic Engineering, ASCE*, 145(5).
 - (4) M.J. Chang, H.K. Chang, Y.C. Chen, G.F. Lin, P.A. Chen, J.S. Lai, Y.C. Tan, (2018) "A support vector machine forecasting model for typhoon flood inundation mapping and early flood warning systems," *Water*, 10(12), 1734; doi.org/10.3390/w10121734.
 - (5) C.H. Huang, J.S. Lai, F.Z. Lee and Y.C. Tan, (2018) "Physical model-based investigation of reservoir sedimentation processes," *Water*, 10(4), 352; doi:10.3390/w10040352. (Published online 22 March 2018)
 - (6) H.K. Chang, Y.J. Lin and J.S. Lai, (2017) "Methodology to set trigger levels in an urban drainage flood warning system – an application to Jhonghe, Taiwan," *Hydrological Sciences Journal*. Doi10.1080/02626667.2017.1409897. (Published online: 06 Dec 2017)
 - (7) W.D. Guo, J.H. Hong, C.H. Chen, C.C. Su and J.S. Lai, (2017) "A simplified simulation method for flood-Induced bend scour—a case study near the Shuideliaw embankment on the Cho-Shui river," *Water*, 9(5), 324; doi:10.3390/w9050324.
 - (8) W.Y. Chang, F. Lin, W.F. Tsai, J.S. Lai, C.H. Loh and S.C. Kang, (2016), "Portable particle image velocimetry measurement using laser-based technique," *Journal of Hydraulic Engineering*. 10.1061/(ASCE)HY.1943-7900.0001158, 04016027.
 - (9) K.R. Adhikari, K.R. Dahal, Z.S. Chen, Y.C. Tan and J.S. Lai, (2015), "Rice–wheat cropping system: tillage, mulch, and nitrogen effects on soil carbon sequestration and crop productivity," *Paddy and Water Environment*, DOI 10.1007/s10333-015-0511-1.
 - (10) A.Y. Chen, T.Y. Yu, T.Y. Lu, W.L. Chuang, J.S. Lai, C.H. Yeh, Y.J. Oyang, H.M. Ma and W.Z. Sun, (2015), "Ambulance service area considering disaster-induced disturbance on the
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- transportation infrastructure,” *Journal of Testing and Evaluation*, 43(2), 10.1520/JTE20140084.
- (11) P. Liu, A.Y. Chen, Y.N. Huang, J.Y. Han, J.S. Lai, S.C. Kang, T.H. Wu, M.C. Wen and M.H. Tsai, (2014), “A review of rotorcraft Unmanned Aerial Vehicle (UAV) developments and applications in civil engineering,” *Smart Structures and Systems*, 13(6), pp.1065-1094.
- (12) T.Y. Pan, M.Y. Li, Y.J. Lin, T.J. Chang, J.S. Lai, and Y.C. Tan, (2014), “Sensitivity analysis of the hydrological response of the Gaoping river basin to radar-rain gauge quantitative precipitation estimation,” *Hydrological Sciences Journal*, 59 (7), pp.1335-1352.
- (13) F.Z. Lee, J.S. Lai*, Y.C. Tan and C.C. Sung, (2014), “Turbid density current venting through reservoir outlets,” *KSCE Journal of Civil Engineering*, 18(2):694-705.
- (14) W.Y. Chang, J.S. Lai, T.Y. Yu, F. Lin, L.C. Lee, W.F. Tsai and C.H. Loh, (2014) (2014), “Pier scour monitoring system by bed-level image tracking,” *International Journal of Sediment Research*, 29, pp. 269-277.
- (15) S.C. Tsung, J.S. Lai and D.L. Young, (2014), “Velocity distribution and discharge calculation at a sharp-crested weir,” *Paddy and Water Environment*, 12(1), pp 203-212.
- (16) T.Y. Pan, L.Y. Chang, J.S. Lai, H. K. Chang, C.S. Lee and Y.C. Tan (2014), “Coupling typhoon rainfall forecasting with overland-flow modeling for early warning of inundation,” *Natural Hazards*, 70 (3), pp. 1763-1793.
- (17) H.T. Ouyang and J.S. Lai, (2013), “Design optimization of submerged vane with streamlined profile for sediment management in rivers,” *Journal of Marine Science and Technology*, Vol. 21, No. 3, pp. 325-332.
- (18) S.G. Somayeh, A. Hossein, Y.M. Chiew and J.S. Lai, (2013), “Jets to control scour around circular bridge piers,” *Canadian Journal of Civil Engineering*, 40(3), pp.204-212.
- (19) S.C. Kang, Y.C. Chan, C.Y. Lu, J.S. Lai, T.H. Lee, (2013), “The development of virtual equipment - a case study of Venturi tube experiment,” *ASCE, Jour. of Professional Issues in Engineering Education and Practice*, 139(4), 281–289.
- (20) T.Y. Pan, Y.T. Yang, H.C. Kuo, Y.C. Tan, J.S. Lai, T.J. Chang, C.S. Lee and K.H. Hsu, (2013), “Improvement of watershed flood forecasting by typhoon rainfall climate model with an ANN-based southwest monsoon rainfall enhancement,” *Journal of Hydrology*, Vol. 506, Dec., pp. 90 – 100.
- (21) W.Y. Chang, G. Constantinescu, H.C. Lien, W.F. Tsai, J.S. Lai, and C.H. Loh, (2013), “Flow Structure around Bridge Piers of Varying Geometrical Complexity,” *Journal of Hydraulic Engineering*, 139(8), pp.812–826.
- (22) Y.J. Huang, C.C. Sung, J.S. Lai, F.Z. Lee, G.W. Hwang and Y.C. Tan (2013), “Measurements of solid suspension concentration and flow velocity with temperature compensation using one portable ultrasonic device,” *Hydrological Sciences Journal*, 58(3), pp.615-626.
- (23) K.R. Adhikari, Y.C. Tan, J.S. Lai, Z.S. Chen and V.S. Mishra, (2013), “Improving farmers’ access to irrigation in the buffer-zone: an effective way to conserve biodiversity in Chitwan National Park,” *Irrigation and Drainage*, 62, pp.592-603.
- (24) H.K. Chang, Y.C. Tan, J.S. Lai*, T.Y. Pan, T.M. Liu and C.P. Tung, (2013), “Improvement of drainage system for flood management with assessment of climate change effects,” *Hydrological Sciences Journal*, 58 (8), pp. 1581–1597.
- (25) C.P. Yang, W.S. Lung, J.T. Kuo, J.S. Lai, Y.M. Wang and C.H. Hsu (2012), “Using an integrated model to track the fate and transport of suspended solids and heavy metals in the tidal wetlands,” *Intl. Jour. of Sediment Research*, 27(2), 201-212.
- (26) W.Y. Chang, F. Lin, J.S. Lai, L.C. Lee, W.F. Tsai and C.H. Loh (2012), “Multi-lens pier scour monitoring and scour depth prediction,” *Proceedings of ICE - Water Management*, 167(2), pp.88 –104.
- (27) W.Y. Chang, W.F. Tsai, J.S. Lai, J.H. Wu, H.C. Lien, T.L. Chung, Y.H. Shiau, Y.H. Liao and F.P. Lin (2012/06), “Development of the real-time monitoring system as a decision-support system for flood hazard mitigation,” *Jour. of the Chinese Institute of Engineers*, 35(7), October 2012, 827-840.
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- (29) T.Y. Pan, Y.T. Yang, H.C. Kuo, Y.C. Tan, J.S. Lai, T.J. Chang, C.S. Lee and K. H. Hsu (2011/12), "Improvement of statistical typhoon rainfall forecasting with ANN-based southwest monsoon enhancement," *Terr. Atmos. Ocean. Sci.*, Vol. 22, No. 6, pp.633-645.
- (30) W. D. Guo, J.S. Lai*, G.F. Lin, F.Z. Lee and Y.C. Tan, (2011/06), "Finite-volume multi-stage schemes for advection diffusion modeling in shallow water flows," *Jour. of Mechanics*, Vol. 27, No. 3, pp.415-430.
- (31) T.Y. Pan, J.S. Lai, T.J. Chang, H.K. Chang, K.C. Chang and Y.C. Tan, (2011/03), "Hybrid neural networks in rainfall-inundation forecasting based on a synthetic potential inundation database," *Natural Hazards and Earth System Science*, 11(3): 771-787.
- (32) J.S. Lai, S.C. Kang, W.Y. Chang, Y.C. Chan and Y.G. Tan, (2011/04), "Development of a 3D virtual environment for improving public participation: case study - the Yuansantze Flood Diversion Works project," *Advanced Engineering Informatics*, Vol. 25, pp.208-223.
- (33) J.S. Lai, C.Y. Chiu, S.K. Chang, J.C. Hu and Y.C. Tan, (2010/06), "Potential inundation hazards in Taipei Basin induced by reactivation of Shanchiao Fault, northern Taiwan," *Terr. Atmos. Ocean. Sci.*, Vol. 21, No. 3, pp.529-542.
- (34) Y.B. Lin, J.S. Lai*, K.C. Chang, W.Y. Chang, F.Z. Lee and Y.C. Tan, (2010/01), "Using MEMS sensors in the bridge scour monitoring system," *Jour. of the Chinese Institute of Engineers* Vol.33, No. 1, pp25-35.
- (35) J.S. Lai*, W.D. Guo, G.F. Lin and Y.C. Tan, (2010/03), "A well-balanced upstream flux-splitting finite-volume scheme for shallow-water flow simulations with irregular bed topography," *Intl. Jour. for Numerical Methods in Fluids*, Vol. 62, pp.927-944.
- (36) J.S. Lai*, W.Y. Chang and C.L. Yen, (2009/07), "Maximum local scour depth at bridge piers under unsteady flow," *Jour. of Hydraulic Engineering*, ASCE, Vol.135, No.7, pp.609-614.
- (37) K.R. Adhikari, Y.C. Tan, J.S. Lai and D. Pant, (2009/12), "Irrigation intervention: a strategy for conserving bio-diversity and improving food security in royal Chitwan national park buffer zone, Nepal," *Irrigation and Drainage*, Vol.58, pp.522-537.
- (38) C.D. Jan, C.J. Chang, J.S. Lai and W.D. Guo, (2009/06), "Characteristics of hydraulic shock waves in an inclined chute contraction – Experiments," *Jour. of Mechanics*, Vol.25, No.2, pp.129-136.
- (39) C.D. Jan, C.J. Chang, J.S. Lai and W.D. Guo, (2009/03), "Characteristics of hydraulic waves in an inclined chute contraction- Numerical simulations," *Jour. of Mechanics*, Vol.25, No.1, pp.75-84.
- (40) J.S. Lai*, W.Y. Chang and C.L. Yen, (2009/02), Discussion of "Flow intensity parameter in pier scour experiments," *Jour. of Hydraulic Engineering*, ASCE, Vol.135, No.2, pp.154-155.
- (41) Y.C. Tan, J.S. Lai and K.R. Adhikari, (2009/02), "Who benefits from allocating agricultural water to other sectors in Taiwan?" *Irrigation and Drainage*, Vol.58, pp.72-85.
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- (43) H. Ouyang, J.S. Lai, H. Yu, and C. Lu, (2008/12), "Interaction between submerged vanes for sediment management," *Jour. of Hydraulic Research*, IAHR Vol. 46, No. 5, pp.620-627.
- (44) W.Y. Chang, L.C. Lee, H.C. Lien and J.S. Lai*, (2008/12), "Simulation of dam-break flows using surface capturing method," *Jour. of Mechanics*, Vol. 24, No.4, pp.391-403.
- (45) C.C. Sung, Y.J. Huang, J.S. Lai and G.W. Hwang, (2008/07), "Ultrasonic measurement of suspended sediment concentrations: an experimental validation of the approach using kaolin suspensions and reservoir sediments under variable thermal conditions," *Hydrological Processes*, Vol. 22, pp. 3149-3154.
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- (48) W.D. Guo, J.S. Lai and G.F. Lin, (2007/12), "Hybrid flux-splitting finite-volume scheme for the shallow water flow simulations with source terms," *Jour. of Mechanics*, Vol.23, No.4, Dec., pp.229-245.
- (49) T.Y. Pan, R.Y. Wang, and J.S. Lai, (2007/08), "A deterministic linearized recurrent neural network for recognizing the transition of rainfall-runoff processes," *Advance in Water Resources*, Vol. 30, pp.1797-1814.
- (50) C.P. Yang, J.T. Kuo, W.S. Lung, J.S. Lai and J.T. Wu, (2007/07), "Water quality and ecosystem modeling of tidal Wetlands," *Jour. of Environmental Engineering, ASCE*, Vol.133, No.7, pp.711-721.
- (51) S.J. Tsorng, H. Capart, J.S. Lai and D.L. Young, (2006), "Three-dimensional tracking of the long time trajectories of suspended particles in a lid-driven cavity flow," *Experiments in Fluids*, Vol.40, pp.314-328.
- (52) Y.B. Lin, J.S. Lai, K.C. Chang and L.S. Li, (2006), "Flood scour monitoring system using fiber Bragg grating sensors," *Smart Materials Structures*, Vol.15, pp.1950-1959.
- (53) Y.B. Lin, J.C. Chen, K.C. Chang and J.S. Lai, (2005), "Real-time monitoring of local scour by using fiber Bragg grating sensors," *Smart Materials and Structures*, Vol.14, pp.664-670.
- (54) G.F. Lin, J.S. Lai and W.D. Guo, (2005), "Performance of high-resolution TVD schemes for 1D dam-break simulations," *Jour. of the Chinese Institute of Engineers*, Vol.28, No.5, pp.771-782.
- (55) J.S. Lai, G.F. Lin and W.D. Guo, (2005), "Simulations of hydraulic shock waves by hybrid flux-splitting schemes in finite volume method," *Jour. of Mechanics*, Vol.21, No.2, June, pp.85-101.
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