

Present Appointment

Deputy Director, Tropical Marine Science Institute (TMSI), National University of Singapore (NUS).

Qualifications

Ph.D. Iowa Institute of Hydraulics Research, University of Iowa, USA (1977)

Dipl. Ing. Technical University of Karlsruhe, Germany (1973)

Work Experience

1973 - 1977 Research Assistant, University of Iowa, USA

1977 - 1978 Post-doc, George Washington University, USA

1978 - 1983 Assistant Professor, University of Mississippi, USA

1983 – now Lecturer, Senior Lecturer, Associate Professor, Dept of Civil Engineering, NUS

2004 – now Principal Research Fellow, Tropical Marine Science Institute, NUS

2007 – 2008 Associate Director, TMSI, NUS

2013 – 2014 Acting Director, TMSI, NUS

2008 – present Deputy Director, TMSI, NUS

Awards and Honors

Honorary Auditor, Asia Oceania Geosciences Society (2017-2019)

Founding member and Treasurer of Asia Water Council (2016 – present)

Keynote Speaker, 11th International Conference on Hydroinformatics, New York, USA, 17-21Aug 2014

Distinguished Lecture, 10th Asia-Oceania Geosciences Society meeting, Brisbane, Australia, 24-28 June 2013

Guest Professor, Sichuan University, China (2013 – 2019)

Best Paper Awards, 9th, 13th and 18th Congresses of the International Association of Hydraulics Engineering and Research – Asia Pacific Division (1994, 2003 and 2012).

Best Poster Awards, 10th and 12th Asia-Oceania Geosciences Society meeting (2013, 2015)

Long Service Award (Singapore) 2014

Bundesverdienstkreuz (Order of Merit) of Federal Republic of Germany, 2007

Member, Technical Advisory Committee of UNESCO's World Water Assessment Program, Paris (2013 – present)

Chairman, Joint IAHR-IWA Hydroinformatics Committee (2009 - 2012)

Secretary, Joint IAHR-IWA-IAHS Hydroinformatics Committee (2004 – 2009)

Associate Editor, International Journal of Environmental Science and Policy (2011 – 2019)

Associate Editor, International Journal of Smart Water (2015 – present)

Editorial Board of Hydro-Science and Engineering, China (2014-2019)

Advisory Board, Korea Society of Civil Engineering, Korea (2013 – present)

Associate Editor, International Journal of Hydroinformatics (2004 - 2011)

President, Hydrological Science Section, Asia-Oceania Geosciences Society (AOGS) (2008 – 2010)

Past-President, AOGS (2010-2011); President Elect, AOGS (2007-2008)

President, Publication Committee of AOGS (2008-2010).

Chair, Hydroinformatics Society, Singapore, (2004 –present)

Invited Visiting Professor/Lecturer at University of Gadjah Mada (Indonesia, 1986, 1988; 3 months each), Disaster

Prevention Research Institute of Kyoto University (1998; 3 months), Technical University of Hamburg-Harburg,

Germany (2002; 3 weeks), Technical University of Darmstadt, Germany (2004; 2 weeks), University of Nice –

Sophia Antipolis, France (2005 – present; 2-3weeks annually)

Research Interests

Climate Change, Downscaling, Weather Forecasting, Radar-based Rainfall Nowcasting, Hydrology and Water Resources; Hydroinformatics, Integrated Water Resources Management, Eco-Hydraulics, Crop Modelling, Low Impacts Development.

Main Research Projects (as Principal Investigator)

“ABC Waters Evaluation And Modelling Project: Punggol New Town - C39 Precinct” (PUB-Monash Univ), 2017-2019.

“Stream Restoration” (National Parks), 2017 – 2019.

“Crop-Drought Indices Study -- A Case Study on Java Island, Indonesia” (International Financial Corporation/World Bank Group), 2017

“Flooding in Asia Mega Cities” (Willis Research Networks, UK), 2009- 2018.

“High Resolution Regional Climate Modelling over Southeast Asia” (CENSAM/SMART), 2009 – 2018.

“Nee Soon Swampy Forest” (National Parks), 2013- 2016.

“Impact of Climate Change on Extreme Rainfall and Drainage Design” (PUB-CCRS-Monash Univ), 2014 – 2016.

“High Resolution Regional Climate Change Impact Study over Singapore” – Risk Map Study (Building Construction Authority), 2010 -2014.

“Multiple Reservoirs” (Singapore-Delft Water Alliance), 2010- 2013

“Climate Change Impacts Study over Singapore” (National Environment Agency), 2007 -2009.

“Development of Predictive Control System for Marina Barrage” (Ministry of Environment and Water Resources), 2005 - 2007

Main Research Projects (as Co-Investigator)

“Tuas Desalination Plant”(Public Utilities Board), 2004 - 2007

“Tsunami Predictive System”(Meteorological Service Division, National Environment and Water Resources Agency), 2005 – 2008

Selected Journal Publications

1. Vu, M.T., Raghavan, V.S., Liong, S.Y. and Mishra, A. (2018): ‘Constructing short duration IDF curves using coupled dynamical-statistical approach to assess climate change impacts’, *International Journal of Climatology*, Accepted, Jan 2018
2. Sun, Y., Kim, D. E., Wendi, D., Doan, C. D., Raghavan, V. S., Jiang, Z. and Liong, S. Y. (2018): Projected impacts of climate change on stream flow and groundwater of Nee Soon Swamp Forest, *Gardens’ Bulletin Singapore*, *Gardens’ Bulletin Singapore*, 70, Suppl.1 : 175-190. doi: 10.26492/gbs70 (Suppl.1).2018-09
3. Vu, M.T., Raghavan, V.S., Liong, S.Y. and Mishra, A. (2017): ‘Uncertainties in gridded precipitation observations in characterizing spatio-temporal drought and wetness over Vietnam’, *International Journal of Climatology*, doi:10/1002/joc.5317
4. Ng, H.L., Li, R, Raghavan, V.S. and Liong, S.Y. (2017): Investigating the relationship between Aerosol Optical Depth and Precipitation over Southeast Asia with Relative Humidity as an influencing factor, *Scientific Reports (Nature)*, doi:10.1038/s41598-017-10858-1
5. Yau, W.K., Radhakrishnan, M., Liong, S.Y., C. Zevenbergen and Pathirana, A. (2017): Effectiveness of ABC waters design features for runoff quantity control in Urban Singapore, *Water*, 9, 577; doi:10.3390/w9080577
6. Naufan, I., Sivakumar, B., Woldemeskel, F. M., Raghavan, V.S., Vu, M.T. and Liong, S.Y. (2017): ‘Spatial connections in Regional Climate Model rainfall outputs at different temporal scales: Application of network theory’, *Journal of Hydrology*, doi: /10.1016/j.jhydrol.2017.05.029
7. Hur, J., Raghavan, V.S., Nguyen, N.S. and Liong, S.Y. (2017): ‘Are satellite estimates good proxies of gauge precipitation over Singapore?’, *Theoretical and Applied Climatology*, doi: 10.1007/s00704-017-2132-7
8. Raghavan, V.S., Liu, J., Nguyen, N.S., Vu, M.T. and Liong, S.Y. (2017): ‘Evaluations of precipitation uncertainties in the CMIP5 multi model historical simulations over Southeast Asia’, *Theoretical and Applied Climatology*, doi.10.1007/s00704-017-2111-z
9. Vu, M.T., Vo, N.D., Gourbesville, P., Raghavan, V.S. and Liong, S.Y. (2017): ‘Hydro-Meteorological Drought Assessment under climate change impact over Vu Gia-Thu Bon river basin, Vietnam’, *Hydrological Sciences Journal*, doi: 10.1080/02626667.2017.1346374
10. Raghavan, V.S., Vu, M.T. and Liong, S.Y. (2017): ‘Ensemble climate projections of mean and extreme rainfall over Vietnam using PRECIS’, *Global and Planetary Change*, doi:10.1016/j.gloplacha.2016.12.003
11. Vu, M.T., Raghavan V.S. and Liong, S.Y. (2016): ‘Deriving short duration rainfall IDF curves from a Regional Climate Model’, *Natural Hazards*, doi: 10.1007/s11069-016-2670-9
12. Sun, Y., Wendi, D., Kim, D. E. and Liong, S. Y. (2016): Development and application of an integrated hydrological model for Singapore freshwater swamp forest. *Procedia Engineering*, 2016, 1002-1009, doi: 10.1016/j.proeng.2016.07.589.
13. Vu, M.T., Aribarg, T., Supratid, S., Raghavan, V.S. and Liong, S.Y. (2016): ‘Statistical Downscaling of Rainfall using Artificial Neural Network: Significantly wetter Bangkok?’ *Theoretical and Applied Climatology*, Vol.126, 453-467. doi: 10.1007/s00704-015-1580-1
14. Sun, Y., Wendi, D., Kim, D. E. and Liong, S. Y., (2016): “Application of artificial neural networks in groundwater table forecasting – a case study in Singapore”, *Hydrology and Earth System Science*, 20, 1405-141

15. Vu, M.T., Raghavan, V.S. and Liong, S.Y. (2015): 'Ensemble Climate Projections for hydro-meteorological drought over a river basin in Central Highland, Vietnam,' *KSCE Journal of Engineering* , Vol. 19 (2), 427-433
16. Wendi, D., Liong, S. Y., Sun, Y. and Doan, C. D., (2016): "An innovative approach to improve SRTM DEM using multispectral imagery and Artificial Neural Network", *Journal of Advances in Modeling Earth Systems*, 8, doi:10.1002/2015MS000536.
17. Vu, M.T., Raghavan, V.S. and Liong, S.Y. (2015): "Use of Regional Climate Models for Proxy Data over Trans-Boundary regions", *Journal of Hydrologic Engineering* dx.doi.org/10.1061/(ASCE)HE.1943-5584.0001342
18. Raghavan, V. S., Vu, M. T. and Liong, S.Y. (2015): "Regional Climate Simulations over Vietnam using the WRF model", *Theoretical and Applied Climatology*, doi: 10.1007/s00704-015-1557-0
19. Vo, N.D., Gourbesville, P., Vu, M.T., Raghavan, V.S. and Liong, S.Y. (2015): "A Deterministic Hydrological Approach To Estimate Climate Change Impact On River Flow: Vu Gia-Thu Bon Catchment, Vietnam", *Journal of Hydro-Environment Research*, doi: 10.106/j.jher.2015.11.001
20. Dulakshi, D.S.K and Liong, S.Y. (2015): "A Simple Clustering Technique to Extract Subsets of data for Function Approximation," *Journal of Hydroinformatics*, Vol 17 (5), 719-732, doi: 10.2166/hydro.2015.065
21. Gan, T.Y., Ito, M., Huelsmann, S., Qin, X., Lu, X., Liong, S.Y., Rutschman, P., Disse, M. and Koivosalo, H. (2015): "Possible climate change/variability and human impacts, vulnerability of African drought prone regions, its water resources and capacity building", *Hydrological Sciences Journal*, doi:10.1080/02626667.2015.1057143
22. Vu*, M.T., Raghavan, V.S. and Liong, S.Y. (2015): "Ensemble Climate Projections for hydro-meteorological drought over a river basin in Central Highland, Vietnam," *KSCE Journal of Engineering* , Vol 19 (2),427-433
23. Sun, Y., Doan, C.D., Dao, A.T., Liu*, J., Liong, S.Y., (2014). "Improving numerical forecast accuracy with ensemble Kalman filter and chaos theory: case study on Ciliwung river model". *Journal of Hydrology*, Volume 512, 540–548, 2014, doi: 10.1016/j.jhydrol.2014.03.016.
24. Liew*, SC, Raghavan, VS and Liong, SY (2014): "Development of Intensity-Duration-Frequency Curves at Ungauged Sites: Risk Management under Changing Climate", *Geoscience Research Letters*, 1:8, doi:10.1186/2196-4092-1-8
25. Vu*, M.T., Raghavan, V.S., Pham, D.M and Liong, S.Y (2014): "Investigating Drought over the Central Highland, Vietnam, using Regional Climate Models," *Journal of Hydrology: Drought processes, modelling, and mitigation*. 10.1016/j.jhydrol.2014.11.006
26. Raghavan, V. S., Vu*, M. T. and Liong, S.Y. (2014): "Impact of climate change on future stream flow in the Dakbla river", *Journal of Hydroinformatics*, doi:10.2166/hydro.2013.165
27. Liu*, J., Doan, C.D., Liong, S.Y., Sanders, R., Fewtrell, T., and Dao, A.T. (2014): "Extreme Rainfall Events in Jakarta: Analyzing, Assessing by Regional Frequency Analysis with L-moment". *Journal of Natural Hazard*, 2014, doi:10.1007/s11069-014-1363-5
28. Liew* SC, Raghavan, VS and Liong, SY (2014): "A novel approach, using regional climate model, to derive present and future IDF curves for data scarce sites", *Journal of Hydro-Environment Research*, (Accepted)
29. Liew*, S.C., Raghavan, V.S. and Liong, S.Y.(2013): "How to construct future IDF curves, under changing climate, for sites with scarce rainfall records?", *Hydrological Processes*, doi:10.1002/hyp.9839
30. Karunasingha, D.S.K., Chui, T.F.M. and Liong, S.Y., 2013:"An approach for modelling the effects of changes in hydrological environmental variables on tropical primary forest vegetation", *Journal of Hydrology*, Vol 505, 102–112
31. Raghavan, V. S., Vu*, M. T. and Liong, S.Y. (2012): "Assessment of hydrological response using regional climate model output - a case of Sesan river basin in Vietnam", *Hydrological Processes*, doi: 10.1002/hyp.8452
32. Vu*, M. T., Raghavan, V. S. and Liong, S.Y.(2012): "SWAT use of gridded observations for simulating runoff – A Vietnam river basin study", *Hydrology and Earth System Sciences*, Vol 16, pp. 2801-2811, doi: 10.5194/hess-16-2801-2012
33. He*, S., Raghavan, V.S., Nguyen, N.S. and Liong, S.Y. (2012): "Ensemble rainfall forecasting with numerical weather prediction and radar-based nowcasting models", *Hydrological Processes*, doi: 10.1002/hyp.9254
34. Vu*, M. T., Raghavan, V. S. and Liong, S.Y. (2011): "Simulating stream flow over data sparse areas – an application of internet based data", *Hydrology and Earth System Sciences Discussions*, 8, 11015-11037, doi:10.5194/hessd-8-11015-2011
35. Nguyen, N.S., He*, S., Raghavan V.S., Doan, D.C. and Liong, S.Y. (2011): "Rainfall Forecast with Ensemble Performance of Translation Model and Numerical Weather Prediction", *Advances in Geosciences*, Vol. 29 *Hydrological Science*, World Scientific Publishing Company
36. Vu*, M. T., Liong, S. Y., Liew, S. C. and Raghavan V. S. (2011): "A novel methodology for developing inundation maps under climate change scenarios using one-dimensional model", *Advances in Geosciences*, Vol. 23, *Hydrological Science*, World Scientific Publishing Company

37. Chui, T.F.M, Low, S.Y. and Liong, S.Y., "An ecohydrological model for studying groundwater-vegetation interaction in wetlands". *Journal of Hydrology* (2011), Vol 409, pp. 291-304
 38. Liong et al. (2009): "Climate Change Impacts Study over Singapore", Confidential Report submitted to NEA
 39. Fielding, M.J., Nott, D.J. and Liong, S.Y., "Efficient MCMC schemes for computationally expensive posterior distributions". *Technometrics*, (2010). (United States).
 40. Romano, M., Liong, S.Y., Vu*, M.T., Zemskey, P., Doan, C.D. Dao, M.H., and Tkalich, P. "Artificial neural network for tsunami forecasting". *Journal of Asian Earth Sciences*, 36 (2009): 29–37. (United Kingdom).
 41. Sundarambal, P., Liong, S.Y., and Tkalich, P., "ANN Application for Water Quality Forecasting," *Marine Pollution Bulletin*, 2008, 56(9), pp. 1586-1597
 42. Yu*, X.Y., and Liong, S.Y., "Forecasting of Hydrologic Time Series with Ridge Regression in Feature Space," *Journal of Hydrology*, Vol 332, 2007, pp 290 - 302.
 43. Karunasinghe*, D.S.K, and Liong, S.Y., "Chaotic Time Series Prediction with a Global Model: Artificial Neural Network," *Journal of Hydrology*, Vol. 323, 2006, pp. 92-105.
 44. Atiquzzaman*, Md., Liong, S.Y., and Yu*, X.Y., "Alternative Decision Making in Water Distribution Network with NSGA-II", *Journal of Water Resources Planning and Management, ASCE*, Vol.132, No. 2, 2006, pp. 122-126.
 45. Doan*, C.D., Liong, S.Y., and Karunasinghe*, D.S.K., "Derivation of Effective and Efficient Data Set with Subtractive Clustering Method and Genetic Algorithm," *Journal of Hydroinformatics*, Vol 7, No. 4, 2005, pp. 219-233.
 46. Liong, S.Y., Phoon, K.K., Pasha*, M.F.K., and Doan*, C.D., "Efficient Implementation of Inverse Approach Using Micro GA", *Journal of Hydroinformatics*, Vol 7, No. 3, 2005, pp. 151-163.
 47. Muttill*, N and Liong, S.Y., "A Superior Exploration-Exploitation Balance in Shuffled Complex Evolution", *Journal of Hydraulic Engineering, ASCE*, Vol 130, No.12, 2004, pp. 1202-1205.
- * Ph.D or Master students under my sole supervision

Book Chapters

48. Liong S.Y., Raghavan V.S. and Vu, M.T.(2013): "Climate Change and its impacts on basin hydrology", *Data Assimilation for Atmospheric, Oceanic and Hydrological Applications*, Volume 2, Springer, ISBN: 978-3-642-35087-0
49. Nguyen, N.S., He, S., Raghavan, V.S., Doan, D.C. and Liong, S.Y. (2012): 'Rainfall Forecast with Ensemble Performance of Translation Model and Numerical Weather Prediction', *Advances in Geosciences*, Vol. 29, Hydrological Science, World Scientific Publishing Company
50. Vu, M. T., Liong, S. Y., Raghavan, V. S. and Liew, S. C. (2011): 'A novel methodology for developing inundation maps under climate change scenarios using one-dimensional model', *Advances in Geosciences*, Vol. 23, Hydrological Science, World Scientific Publishing Company.
