Faculty Development Program

Title : Artificial Intelligence for Environmental and Water Resources Engineering

Date : 04-Dec-2023 - 08-Dec-2023
Time : 10:00 - 17:30
Venue : CDMM 303

Discussion Points

- Groundwater Quality Index Modelling using AI Techniques
- Applications of AI in experimental hydraulics and river training work
- Hydrological Modelling and forecasting, water resources management using AI methods
- Complementing Machine Learning and Numerical Models for Water Resources Management
- Application of Soft Computing Techniques in Water Resources Engineering
- Soft Computing Applications in Hydraulic Engineering
- Machine Learning In Environmental Monitoring
- Bio-inspired Computational Intelligence for Groundwater Simulation and Optimisation

	**Resource Person 1 - Details** **Name :** DR L ELANGO **Designation :** Professor Emeritus, Civil Engineering **University/ Company :** IIT Madras, Chennai **Address :** India, 6000025.
	**Resource Person 2 - Details** **Name :** Dr Manish Pandey **Designation :** Assistant Professor, Civil Engineering **University/ Company :** IIT Kharagpur, Kharagpur **Address :** India, 721302.
	**Resource Person 3 - Details** **Name :** Dr R Maheswaran **Designation :** Assistant Professor, Civil Engineering **University/ Company :** IIT Hyderabad, Hyderabad **Address :** India, 721302.
	**Resource Person 4 - Details** **Name :** Dr L Surinaidu **Designation :** Scientist, Hydrology **University/ Company :** National Institute of Hydrology, Roorkee **Address :** India, 247667.
	**Resource Person 5 - Details** **Name :** Dr Arunkumar R **Designation :** Assistant Professor, Civil Engineering **University/ Company :** National Institute of Hydrology, Roorkee **Address :** India, 673601.
	**Resource Person 6 - Details** **Name :** Dr Saravanan R **Designation :** Professor, Civil Engineering **University/ Company :** Anna University, Chennai **Address :** India, 600025.
	**Resource Person 7 - Details** **Name :** Dr Hazi Azamathulla **Designation :** Professor, Civil Engineering **University/ Company :** University of West Indies, St Augustine **Address :** West Indies, 669684.
	**Resource Person 8 - Details** **Name :** Krishnakumar K **Designation :** Associate Professor Grade 1, School of Design **University/ Company :** VIT, Vellore **Address :** India, 632014.

Resource Person's Profile :

1. Profile of DR L ELANGO

He is Professor Emeritus in IIT Madras.
Expert in Groundwater hydrology, Environmental hydrogeology and Groundwater modelling

2. Profile of Dr Manish Pandey

Expert in Experimental Hydraulics, Sediment Transport, River Training Works, Bridge Scour.

3. Profile of Dr R Maheswaran

Expert in Stochastic Hydrology, Hydrologic Forecasting, Multiscale Processes and modelling, Multiscale Modelling, AI and ML, Climate Change

4. Profile of Dr L Surinaidu

Expert in Water Resources, Hydrogeology, Hydro geo physics, Integrated Hydrological Modelling, Hydrochemistry

5. Profile of Dr Arunkumar R

Expert in Stochastic Modeling, Simulation and Optimization of Water Resources Systems, Artificial Neural Network, Model Tree, Genetic Programming, Evolutionary Optimization Algorithms, Irrigation Water Management, Design of Micro-Irrigation Systems, Climate Change Impact Assessment on Water Resources, Application of Remote Sensing and GIS in Water Resources

6. Profile of Dr Saravanan R

Dr.R.Saravanan, Professor, holding a Ph.D in Groundwater Modelling and Management at Centre for Water Resources, Anna University, Chennai, India. He is basically a Civil Engineer, specialist in Hydrology and Water Resources Engineering. His Ph.D was on Optimisation of Pumping Well Location for Containment and Remediation of Contaminant Plume using Genetic Algorithm. He has completed several researches and consultancy projects a Principal investigator as well as co investigator. He has evaluated

7. Profile of Dr Hazi Azamathulla

Expert in AI and ML in Water Resources Engineering, Hydraulics, Physical hydraulic model studies, Hydroinformatics, Climate change

8. Profile of Krishnakumar K

Computer Vision
Artificial Intelligence
Video Processing
Image Processing and Image Compression.

Engineers have attempted to solve the problems in water resources with the help of empirical, regression based and numerical models. Empirical models are not universal, nor are regression-based models. The numerical models are, on the other hand, physics-based but require substantial data measurement and parameter estimation. Hence, there is a need to employ models that are robust, user-friendly, and practical and that do not have the shortcomings of the existing methods. The last few years have seen a dramatic increase in soft computing application in Environmental and Water resources engineering.. The Artificial Neural Network, Fuzzy Logic, and Genetic Algorithm are fairly new methods in water resources and Environmental engineering. Artificial intelligence methods meet this demand to be a definite need of the hour. Artificial intelligence in water resources and Environmental applications in Water quality include predicting and forecasting floods, predicting suspended sediment, predicting event-based flow hydrographs and Sedimentographs, locating seepage path in an earth-fill dam body, and the predicting dispersion coefficient in natural channels

Soft Computing

Coordinator's:	**Prof. UMA SHANKAR M 10831 - Professor Grade 1 - SCE** **Prof. MAHENTHIRAN S 16337 - Assistant Professor Sr. Grade 2 - SCE**