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Remote sensing monitoring system of water environment in the pearl river delta

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With the rapid development of economy and urbanization in Pearl River Delta (PRD) region of China, water quality has been impacted negatively. The governments and citizens around the PRD are full of enthusiasms to control the water pollution and need the information of water environment, so fund a project called "constructing the monitoring system of water quality and quantity in the Pearl River Delta region". Considering the requirements of water environment monitoring as well as the advances of remote sensing and Geographic Information System (GIS) technologies, a remote-sensing-based monitoring system of water environment is designed and implemented. The system is a Web system consisting four layers which are data and service layer, logical layer, representation layer, as well as application layer. Data and service layer provides the remotely sensed data and observed data for the system in database, as well as a 2D map service and 3D engine service; logical layer is responsible for the process of water environment with encapsulating lots of function modules; representation layer is a Web portal for users to interact with system and show the results calculated by the logical layer in 2D and 3D environments; application layer is comprised of users who apply the system. The function modules include layers' representation and operation, image data management, real observation data management, image data pre-processing, image and real observation data process, as well as results' representation and statistics for both inland and coastal domains. Invoking function modules on different servers by portal is crossing the Web, therefore there will be cross-domain and cross-machine invoking questions. To overcome these operations, Web service technology is adopted. Functions deployed on servers are encapsulated into Web services for integrating in the system. The advances of this system are Web-based, collaborative, loosely couple, managing/processing volumes of and kinds of remotely sensed data, as well as representing and simulating results in integrated 2D and 3D environment. Some 2D and 3D operation instances are showed in experiments, moreover in practice, the system shows great power for water environment monitoring in PRD.

Biography

Zeqiang Chen has completed his Ph.D. at the age of 29 years from Wuhan University, China, majored in Geographic Information System (GIS), and now he is a postdoctoral fellow in The Chinese University of Hong Kong, Hong Kong. He has published more than 6 papers in reputed journals. He was a Research Assistant at the Center for Spatial Information Science and Systems, George Mason University, USA. His current research interests include hydrological application system and sensor Web.

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