THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

土木及環境工程學系
DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

SEMINAR

GEOTECHNICAL SEEPAGE SIMULATION METHODS AND INTELLIGENT CONSTRUCTION & MAINTENANCE TECHNOLOGY FOR UNDERGROUND ENGINEERING

Speaker

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Abstract

Focusing on the key theoretical challenges in the prevention and control of major sudden surge water disasters in tunnels and underground projects, the seepage disaster mode and sudden surge water mechanism of rock-groundwater system have been revealed. Meanwhile, the numerical methods for the whole process of disaster evolution of rock-groundwater system have been performed and the disaster analysis software HazE has been independently developed, after which the risk warning and control technology of water surge disasters have been established. The difficulty of disaster mechanism, as well as the early warning for disaster prevention and control, has been solved. The decision-making level of disaster prevention has then been scientifically improved.

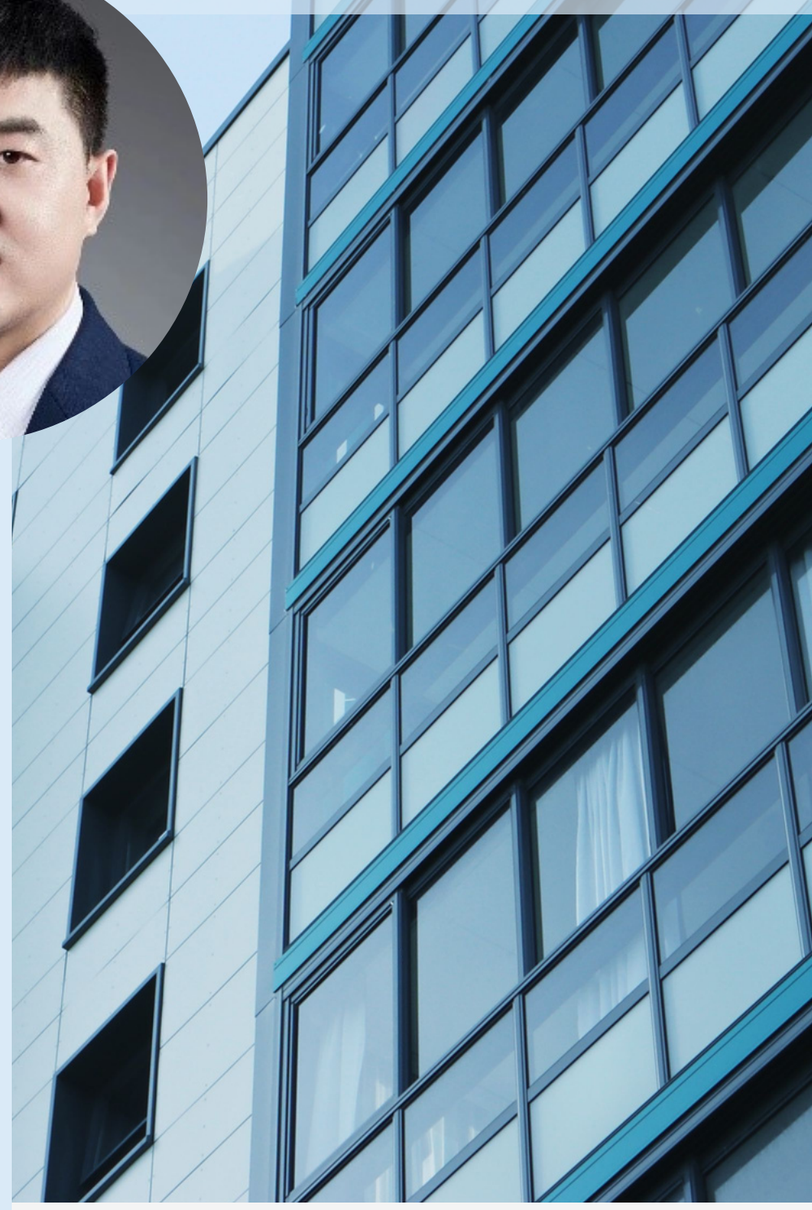
In view of the pressing demand of unmanned construction of tunnels under extreme environment and extreme geological conditions, two major robot systems have been proposed for drill-blast method tunnelling auxiliary and constructions, which has gradually been applied to a major railroad tunnel in southwest China; The "five senses and one brain" equipment system has been developed and successfully installed into the "Smart One" shield machine and launched in Jinan Metro Line 6; The multi-process anchor boring machine for small section tunnel has been developed and applied in the water diversion project in central Yunnan.

To solve the challenge of accurate detection and efficient diagnosis and treatment of operational tunnels, a high-speed information collection and accurate extraction technology integrating "laser-vision-radar" has been proposed and an intelligent detecting robot for multiple types of diseases in the whole area has been developed. A scientific decision-making method for disease remediation has been proposed, after which intelligent robots for efficient disease remediation and synergistic matching repair materials have been developed to achieve rapid targeted repair of diseases.

Biography

Liping Li, PhD, Professor and Dean in School of Qilu Transportation, Shandong University. The National Science Fund for Distinguished Young Scholar, Chief Scientist of Key R&D Program Project, Backbone members of the National Party Building Work Model Branch and Huang Danian Style Teacher Team. He won China Youth Science & Technology Award, Zhan Tianyou Achievement Award, Tencent Science Discovery Award and "Archimedes" International Gold Award for New Inventions and Technologies, Member of the overall expert group of national transportation infrastructure key special projects and technical expert group of Sichuan-Tibet Railway construction project implementation. He is currently the Dean of School of Qilu Transportation in Shandong University and the Deputy Director of National Key Laboratory of Intelligent Manufacturing of High-end Construction Machinery. He is also the vice chairman of the Rock Engineering Design Methods Branch of the Chinese Society of Rock Mechanics and Engineering, and the vice chairman of the Youth Committee and the Chemical Grouting Branch of the Chinese Water Resources Society. And he serves as the deputy editor-in-chief of Tunnel Construction.

His research interest spans intelligent construction and disaster prevention and control of underground engineering. He was awarded 1 national scientific and technological progress and technical invention second prize each, 3 provincial and ministerial scientific and technological progress and technical invention first prizes (1st), all papers H index 39, and published more than 90 SCI/EI papers with first and corresponding authors (1 "China 100", 6 highly cited); 2 US patents, 7 international patents PCT, 57 Chinese invention patents, 14 soft papers (all No.1); 10 standards and work methods. He was also selected as the chair of the World Transportation Congress (WTC) Tunnelling Engineering Section on Tunnel Construction and Disaster Control.



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