

## Key Issues on Autonomous Train Control System

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### Abstract

With the rapid development of high-speed railways in recent years, it has become the nation's fundamental transportation mode. An intelligent, networked, and autonomous railway becomes the inevitable requirement and trend for the future development of the intelligent high-speed railways. As a typical industrial and critical control system, the autonomous train control system has the characteristics of wide distributions, various operation scenarios, and discrete parameters. All these characteristics put forward higher requirements for the reliability and safety of the system. Here, the fundamental theories and key issues, such as intelligent perception, driving, rescheduling, and integration of dispatching and control in the autonomous train control system, are expounded in detail. Further, the technical difficulties and solutions are analyzed, and the future development directions are summarized.

### About the speaker



**Hairong Dong** is currently a professor with the State Key Laboratory of Rail Traffic Control and Safety, and also the deputy director of the National Engineering Research Center for Rail Transportation Operation Control System, Beijing Jiaotong University, Beijing, China. Dr. Dong focuses on the research of intelligent control and operation of rail transit, and presided more than 30 national and ministerial-level projects, such as major projects of the National Natural Science Foundation of China. She has published more than 100 papers and has been granted more than 20 national invention patents. Dr. Dong was also awarded the second prize of the National Science and Technology Progress Award, the second prize of the Beijing Municipal Science and Technology Progress Award, the second prize of the National Teaching Achievement Award, the first prize of the Beijing Teaching Achievement Award, Chinese Association of Automation Young Scientist Award, etc. She was honored as the Yangtze River Scholar Distinguished Professor, obtained the National Science Foundation for Distinguished Young Scholars of China, and was supported by the National High-Level Talents Special Support Plan (“Million People Plan”) by the Organization Department of the CPC Central Committee. Dr. Dong serves as an Associate Editor of the IEEE Trans-ITS, IEEE Trans-IV, IEEE ITS Magazine, Journal of Intelligent & Robotic Systems, etc. She is currently the Fellow, Deputy Secretary-General, and Deputy Director of Control Theory Committee of the Chinese Automation Congress, the Chair of the Technical Committee on Railroad Systems and Applications of the IEEE Intelligent Transportation Systems Society.