

Embodied Intelligence: A New Frontier for AI and Automation Education

Professor Junfei Qiao 乔俊飞

Beijing University of Technology

Abstract

This talk presents a systematic analysis of embodied intelligence, covering its technological evolution, industrial landscape, and implications for higher education. As a paradigm shift from disembodied AI to physical-world interaction, embodied intelligence represents both a new form of AI empowering diverse sectors and an advanced stage of automation. Given the aggressive deployment by global tech giants, the strategic prioritisation of embodied intelligence in China's 15th Five-Year Plan, and the widening talent gap, the establishment of embodied intelligence major has become an urgent necessity. The talk advocates for the development of the embodied intelligence major centred on the closed-loop “perception–decision–action” paradigm, leveraging information disciplines to cultivate talents with composite “AI + physical systems + scenarios” expertise. It proposes a “major + micro-major” structure, project-based learning with real-world challenges, and industry-integrated virtual-physical training platforms. Looking forward, education should shift from knowledge transmission to cognitive shaping, foster open educational communities, and embrace the emerging frontier of human-machine symbiosis.



Junfei Qiao received the Ph.D. degree in control theory and control engineering from Northeastern University, Shenyang, China, in 1998. He is currently a Professor with the School of Information Science and Technology, Beijing University of Technology, Beijing, China, and he is also the President of Beijing University of Technology. As a pioneer in the field of smart environmental protection, he is the Principal Investigator of the Innovative Research Group Project of the National Natural Science Foundation of China. He is a Distinguished Professor of the Changjiang Scholars Program and a recipient of the National Science Fund for Distinguished Young Scholars. He currently serves as a member of the Academic Degree Committee of the State Council, Vice Chairman of the Teaching Steering Committee of the Ministry of Education, a member of the Science and Technology Committee of the Ministry of Education, Director of the Beijing Smart Environmental Protection Laboratory, and Director of the Engineering Research Center of Intelligent Perception and Autonomous Control of the Ministry of Education. His research interests include computational intelligence, intelligent optimization control, and smart environmental protection.