Special Issue

Vision-Guided System in Intelligent Autonomous Robots

Message from the Guest Editors

Autonomous intelligent robots and systems are at the forefront of innovation in robotics, automation, AI, and human-machine interaction. However, several key challenges remain unresolved in current research and development efforts. These challenges include the following: (1) AI methods are not yet capable of effectively addressing the combined challenges of visual perception, control, navigation, and deep learning. (2) Existing vision-based perception techniques require improvements in feature extraction and learning efficiency, which could be addressed through high-performance computing and have latency. 3) As visual perception networks become increasingly complex, their training costs rise significantly. Given these limitations, current control methods in autonomous robots and systems are insufficient to solve the above problems. Therefore, there is an urgent need to study the unique characteristics, requirements, and constraints of vision-based perception and task-control mechanisms. This is crucial for enhancing the capabilities of autonomous robots in performing diverse tasks more intelligently and efficiently.

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