Special Issue

AI-Powered Agricultural Robots: From Field Sensing to Autonomous Operation

Message from the Guest Editors

This Special Issue focuses on cutting-edge research and practical innovations in AI-powered agricultural robots, spanning the entire pipeline from field sensing to autonomous operation. The rapid integration of artificial intelligence (AI) into agricultural robotics has transformed how we monitor, analyze, and manage crop production. Traditional farming has relied heavily on manual labor and basic mechanization but advances in field sensing, computer vision, and machine learning have enabled robots to perform complex tasks with increasing precision and autonomy. Over the past decade, significant progress has been made in multi-modal sensing technologies combined with AI-driven decision-making to enhance crop monitoring and productivity. Topics of interest include robotic perception, multi-sensor fusion, crop phenotyping, real-time growth monitoring, precision harvesting, field navigation, and bio-feedback control systems. We are particularly interested in contributions that integrate deep learning, reinforcement learning, physics-informed models, and digital twin frameworks for robust, data-driven agricultural solutions.

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