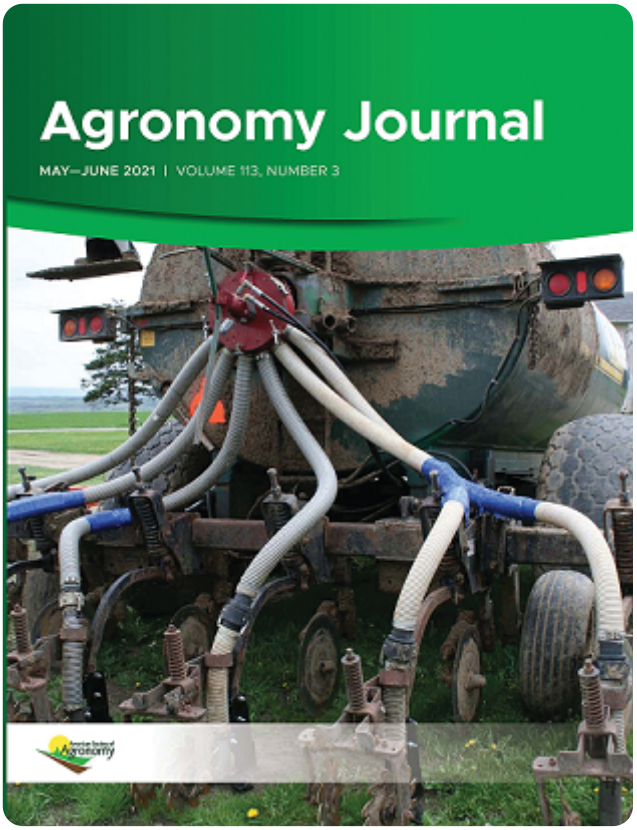
Science Societies

Call for papers: ‘Emerging Bio-robotics’ special section

August 10, 2021



You are invited to submit a manuscript to be considered for inclusion in an upcoming special section in *Agronomy Journal* on "Emerging Bio-Robotics for Real-Time Smart Farming."

Manuscripts should be submitted at ***https://mc.manuscriptcentral.com/agron*** *by 10 Feb. 2022.*

If you have questions on submitting, please contact the Lead Guest Editor, Gunasekaran Manogaran, at Send Message or Send Message.

Overview

With constant population growth, exacerbation of water resources, decreased agricultural land, energy crises, and a decline in the labor force, the agricultural sector faces significant challenges. Moreover, due to rapid industrialization and urbanization, many developed and developing countries face the issue of substantial water crises. Unpredictable climate variation, including intense storms, floods, extreme weather conditions, and heat waves, will adversely impact the agricultural sector. Smart farming with automation can subsequently alleviate the challenges that traditional farming faces. In this regard, agriculture robotics emerge as a promising solution to yield high quality production with minimum expenses and labor in a sustainable way to meet the growing food demands.

Agricultural robots revolutionize the farming industry significantly. The integration of sensing technology, digital tools, and control strategies has enhanced the design and development of agri-robots and demonstrates significant benefits in real-time smart farming. Agri-robot-based smart farming collects weather data and high-resolution field images via ground-based or airborne-based internet of things (IoT) sensors, transmitting these real-time data to a controlling unit that interprets and extracts information for decision-making. The analyzed result is then further sent to field robots, farmers, or agro-industries to take appropriate action. With agri-robots, smart farming faces significant challenges in the context of adaptability, flexibility, object identification, sensor optimization, and task-planning algorithms. To successfully execute the farming task in an autonomous environment, the research should be focused on developing a robotic system with built-in machine intelligence and multifunctionality of the natural organism. To address this challenge, biological functionality with artificial intelligence and machine-learning approaches needs to be introduced to enhance robotic systems performance.

In recent years, the benefits of biologically inspired methods in agricultural robotics have become increasingly significant. Research in this area has effectively fused techniques from sensor technology, neuroscience, artificial intelligence, machine learning, and robotics. Bio-robotics is an emergent technology characterized by multidisciplinary approaches to strengthen the collaboration between roboticists and biologists. For real-time smart farming, bio-robotics is considered a potential solution to deal with challenges encountered in traditional agro-robotics. Bio-robotics offers a wide range of applications in the agriculture sector, including automated seeding, planting, harvesting, weeding, and crop nursing. However, the most significant challenge is the design and development of bio-robotics for real-time smart farming that possess sensing perception, intellectual response, and effective actuation and

control strategies.

This special issue focuses on introducing technological challenges and opportunities in bio-robotics while transforming traditional agri-robots into biologically inspired intelligent robots. We invite researchers to submit their original research articles that explore the fusion of biologically inspired algorithms, sensing technology, artificial intelligence, and robotics to provide efficient and intelligent bio-robots in real-time smart farming. To view the full call for papers, including topics of interest for this special section, please see **https://bit.ly/37fPpKk**.

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