proceedings

Abstract

Future Advancements and Potential Applications of Biomimetic Sensors in Agriculture †

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† Presented at the 1st International Online Conference on Biomimetics (IOCB 2024), 15–17 May 2024; Available online: https://sciforum.net/event/IOCB2024.

Keywords: biomimetic sensors; sensor design; agricultural sustainability; potential applications; environmental degradation

Global population growth, environmental degradation, climate change, and geopolitical issues are putting pressure on sectors like agriculture, forestry, water management, environmental protection, and biodiversity preservation, making the sustainable use of the environment a growing challenge. The potential uses of biomimetic sensors in agriculture and other sectors have drawn a lot of interest in recent years. Despite extensive research on biomimetic sensors in general, a comprehensive analysis of their unique applications and developments in agriculture is still lacking. Hence, this paper aims to provide a comprehensive understanding of the future advancement and application of biomimetic sensors' potential in various sectors, highlighting their potential in agriculture. Through synthesizing the available literature from the last 10 years, this paper delves into the integration of biomimetic sensors in agricultural practices, highlighting potential benefits and identifying current limitations, challenges, and construction. It will encourage researchers, experts, and industry professionals to explore new ways to enhance biomimetic sensor capabilities in the agricultural sector. This review suggests that biomimetic sensors in agriculture require further studies to develop advanced technologies, optimize design, enhance capabilities, and functionality, and integrate fields like biology, materials science, and engineering. Integrating data analytics and machine learning could lead to precision agriculture and real-time crop health monitoring.

Author Contributions: Conceptualization, M.I.A.; Validation, M.I.A., H.C., L.L. and J.H.; Resources, M.I.A., H.C., L.L. and J.H.; Writing—original draft preparation, M.I.A.; Writing—review, M.I.A.; Editing, M.I.A., H.C., L.L. and J.H.; Investigation, M.I.A.; Supervision, M.I.A. and J.H. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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Citation: Abdulraheem, M.I.; Chen, H.; Li, L.; Hu, J. Future Advancements and Potential Applications of Biomimetic Sensors in Agriculture. *Proceedings* **2024**, *107*, 9. https://doi.org/10.3390/proceedings2024107009

Academic Editor: Marc Weissburg

Published: 15 May 2024

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Data Availability Statement: No new data were created.

Conflicts of Interest: The authors declare no conflicts of interest.

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