

Hort Forum

Opportunities and challenges in integrating AI technologies into horticultural research and production

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Registration link:
https://us02web.zoom.us/webinar/register/WN_quBbXyXjQjaiPwbgTNkhQg#/registration

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International Society for Horticultural Science



The International Society for Horticultural Science invites you to the eighth episode of Hort Forum:

Opportunities and challenges in integrating AI technologies into horticultural research and production

Speaker: Brian Bailey, Associate Professor,
Department of Plant Sciences, University of California, Davis

Abstract

Within a few short years, AI technologies have permeated nearly every aspect of our lives, and are re-defining many industries. Accordingly, AI has made its way into horticultural research and production, with the most common application being the rapid processing of imagery data to extract plant traits or other relevant information. There are many data-related, technical, and ethical challenges that must be addressed in order to facilitate widespread adoption of AI technologies in horticulture. The success of AI models hinges on the availability of high-quality and high-volume data with necessary contextual information that the model can use to learn. While general large language models (LLMs) have successfully leveraged the internet as a comprehensive data source, horticultural applications often lack the required data. This talk will introduce techniques our group has been developing to overcome the problem of data availability for AI model training by linking 3D biophysical models with AI models via synthetic data, whereby simulated data can be used to supplement available datasets or enable AI model prediction of traits and processes that cannot be readily measured with high throughput. These ideas will be presented as one of many potential approaches for harnessing the power of AI tools in horticultural applications.



Short Bio

Dr. Brian Bailey comes from an interdisciplinary background that spans the fields of engineering, computer science, and plant biology. He received his PhD in mechanical engineering, which focused on better understanding the physics of turbulence and energy transfer in plant systems. Prior to joining the Department of Plant Sciences at the University of California, Davis in 2016, he was a researcher at the USDA-ARS working on the development of improved biophysical models of grape powdery mildew spread. His current research program has focused on developing the next-generation of physically-based crop models that predict crop system-level responses to management practices and environmental variability. Current applications of these technologies include perennial crop design and management, water-use efficiency, microclimate and heat mitigation, and high-throughput phenotyping and sensing, among others.

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