Hyperspectral Imaging Q&A Session with Grapevine Viruses and Grapevine Disease Research Committee

OPEN SESSION

FRIDAY, APRIL 19, 2024 (3:00 – 4:30 PM EDT)

3:00 pm **Welcome, Introductions, and Overview of the Open Session**
Anna Whitfield, Committee Chair

The committee asked the speaker to address the following topics/questions in their recorded presentations, which were submitted beforehand for the committee to view (available at the study website):

- What is the current state of research on hyperspectral imaging for detecting grapevine viruses such as leafroll and red blotch?
- What are the major roadblocks in applying hyperspectral imaging to virus detection?
- How early in the infection process can hyperspectral imaging detect viral infections in grapevines? Is it effective for detecting asymptomatic infections?
- What specific spectral signatures or patterns are indicative of grapevine viruses, and how reliable are they for accurate diagnosis?
- Are the challenges different for asymptomatic and symptomatic plants? Do you expect that co-infection also complicates this?
- What do you prefer as a ground truthing method (i.e., ELISA/PCR?) and is ground truthing data a challenge?
- Are there any ongoing research projects or future directions in this field that you find particularly promising or exciting?
- Are there are any specific camera instruments/vendors that you would recommend for hyperspectral imaging given that the performance continues to improve and cost to fall (cubert, for example).

3:10 pm **Q&A on Hyperspectral Imaging for Grapevine Virus Disease Detection**

Empowering Autonomous Virus Detection in Vineyards: Hyperspectral Vision Systems Bridging Science and Industrial Application *Luca Brilliante, Fresno State University*

Combination of Spectroscopy and Data Analytics for the Early Detection of Red Blotch Infection in Grapevines *Nitin Nitin, UC Davis*

4:30 pm **Adjourn Open Session**

SPEAKER BIOS

Dr. Luca Brillante holds the esteemed Bronco Wine Co. Chair in Viticulture and serves as an Associate Professor at California State University Fresno. His research focuses on precision and digital viticulture alongside regenerative and organic management. He's dedicated to developing innovative sensor technology, optimizing vineyard sustainability and efficiency, and addressing contemporary challenges like climate change and labor availability. Since 2011, he has been a pioneer in adopting AI technologies in viticulture, as demonstrated by academic publications and commercial implementations. In the last six years, he has focused intensive efforts on hyperspectral vision systems to address critical issues in vineyard management: disease detection, particularly viruses, irrigation scheduling, grape composition mapping, and forecasting.

Dr. Nitin is a professor in the departments of Food Science and Technology and Biological and Agricultural Engineering at UC Davis. He also serves as a vice-chair in the Department of Food Science and Technology and a Barrett's Faculty Fellow. His research interests are at the interface of biomaterial science, biosensors, mathematical modeling, and data analytics. In collaboration with mentees, and colleagues, he has co-authored over 185 peer-reviewed publications and is a co-inventor for ten patents and eight patent applications. Prof. Nitin has mentored the training of over 35 PhD and postdoctoral associates. Several of these trainees are in tenured/tenure track faculty positions and leading roles in the food and biotechnology industries.