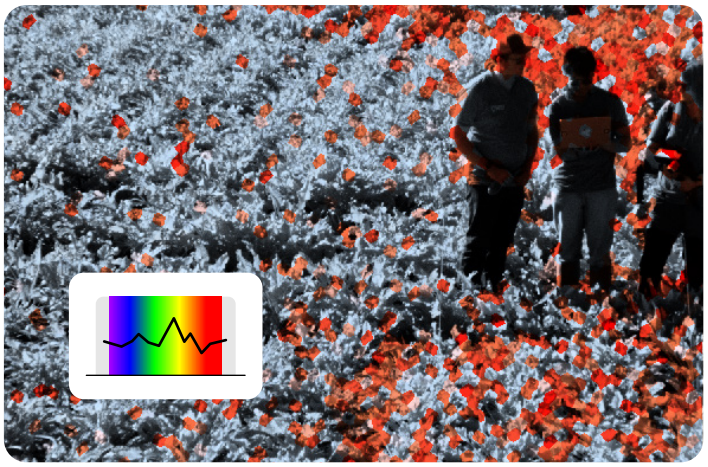
Living Optics

Hyperspectral Imaging in Agriculture and Food Production

Supporting producers to improve crop yields and feed the world. Enhance food supply chains with real-time actionable insights.



Food security challenges

The food security of future generations is under threat from climate change, water scarcity, soil degradation, and the overuse of pesticides. To ensure we can feed a growing global population, producers are turning to precision agriculture techniques:

- The early detection of stress factors such as disease, pests, drought and nutrient deficiencies to implement enhanced mitigation strategies.
- Data to drive decision-making and ensure the optimal use of resources such as water, fertilizer and pesticides.
- More accurate crop yield estimates using real-time analysis for actionable results in the field.

Hyperspectral imaging (HSI)

HSI a passive sensing technique that sees colour at many more wavelengths than conventional colour (RGB) cameras. Since the spectrum of light reflected from an object contains information about its chemical make-up, it can be used to analyse critical properties such as chlorophyl content and overall plant health, sugar content and ripeness, that are impossible to quantify using RGB.

Living Optics' Solution

Implement precision agriculture practices in the field and improve supply chains with a portable camera providing real-time actionable insights.

Crop monitoring

Non-destructive, real-time monitoring that goes beyond the outer layers of the plant, revealing critical metrics related to crop health and growth.

Data-driven decisions

Hyperspectral data empowers producers to make smarter decisions to better manage resource utilisation and enhance output. Learn when to use resources, make interventions before visible changes.

Reducing food waste

Harvest for optimal yield and shelf life. Improve the supply chain and support reprocessing and/or product redirection with the early detection of disease, faults, defects and contamination.

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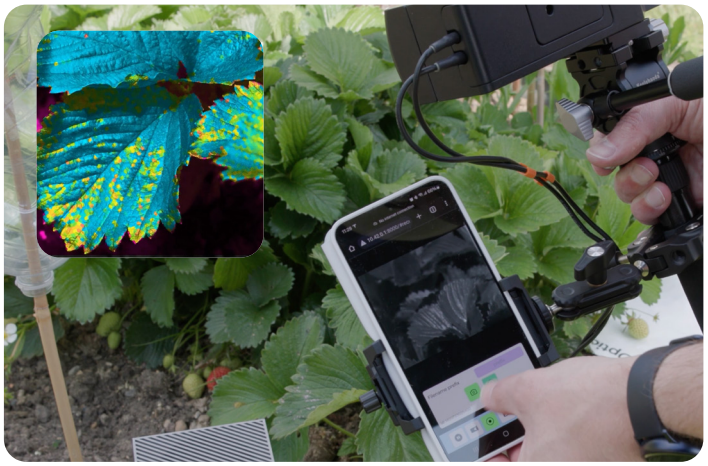
The Living Optics Camera

Based on pioneering proprietary snapshot technology, the Living Optics Camera is a lightweight, highly portable system capable of real-time hyperspectral sensing at video frame rate.

Packaged with an NVIDIA edge compute and Python development environment, our development kit provides everything you need to get started with hyperspectral imaging.

Features:

- Real-time hyperspectral analysis for immediate actionable results in the field.
- Local image processing and information output on integrated edge compute.
- Portable system allows easy installation or use for hand-held applications in the field.
- Full-stack tooling provided: hardware, software and a suite of applications examples for quick-start exploration.
- Designed with interoperability and systems integration as a core feature.
- High spectral resolution data captures insights not possible with RGB or multispectral systems.



Precision agriculture

Living Optics is collaborating with producers to enable non-invasive monitoring approaches in the laboratory, glasshouse and field settings.

Disease detection in crops

Spectral imaging has proven to be a valuable tool in precision monitoring and diagnosis of various plant diseases. The approach facilitates the accurate determination of disease severity enabling timely intervention measures.

Orchard fruit ripeness and yield estimates

Fruit farmers rely on accurate yield estimation. Using a field-deployable camera and computer vision techniques reduces the need for laborious manual testing.

Tracking plant health in vineyards

Handheld imaging in vineyards provides spectral analysis capable of detecting reduced chlorophyll levels in healthy-looking green leaves. This enables the localized application of fertilizers and the adaption of irrigation schemes. These early detection methods improve plant growth for higher crop yields.

Plant phenotyping

The development of new crop varieties is crucial to sustainable production. Spectral biomarkers offer a high throughput approach to breed for desirable traits.

About Living Optics

Living Optics is on a mission to make hyperspectral imaging widely accessible. Our cutting-edge technology captures data inaccessible to the human eye and conventional cameras, delivering information in an affordable and portable solution for a diverse range of industrial and consumer applications.

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