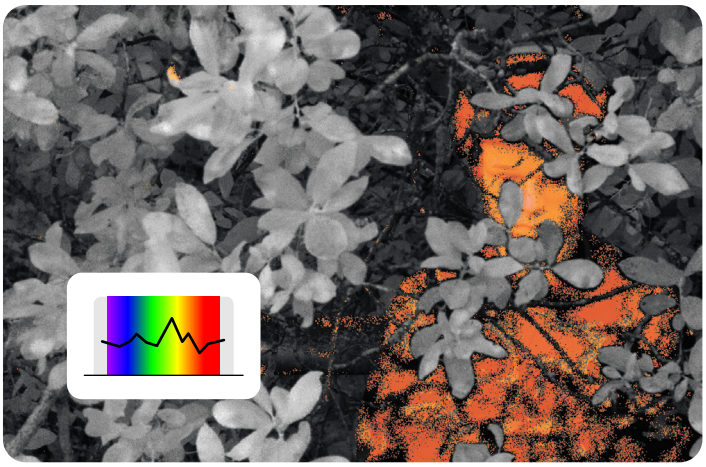
Living Optics

Hyperspectral Imaging Camera for National Security Applications

Reveal previously unseen information. Provide an extra layer of perception. Generate timely and actionable insights.



The problem with machine vision

Conventional imaging hardware is insufficient to unlock reliable machine perception. Changes in context challenge even the most sophisticated software algorithms.

National Security Challenges

- Detection of concealed objects, firing positions and observation posts in contested battlespaces requires advances in deployable technologies.
- Covert operations require passive systems with increased autonomy.
- Surveillance and sentry systems can generate bandwidth intensive live data streams.

Hyperspectral imaging (HSI)

HSI a passive sensing technique that sees colour at many more wavelengths than conventional (RGB) cameras. With both spatial and spectral information, it is possible to recognize objects from their inherent material properties. HSI has yet to step-up to enable advanced machine vision performance, until now.

Living Optics' Solution

Cutting-edge proprietary technologies bringing Hyperspectral Imaging (HSI) into tactical deployments. Bringing more informative, robust and reliable data needed for timely and actionable insights.

Detect, identify, segment and track known signatures and unknown anomalies.

- Spectral signatures provide higher confidence automation in surveillance.
- Live threat detection overlay for cueing and improved situation awareness.
- Passive sensing and autonomous target recognition reduces likelihood of platform detection.
- Onboard compute reduces bandwidth.
- Spatial-spectral detection to highlight scene anomalies.
- Built-in ML inference and live snapshot hyperspectral imaging capable of detecting modern camouflage materials.

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The Living Optics Camera

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

Features:

- Real-time hyperspectral analysis for immediate actionable results in the field.
- Local image processing and information output on integrated edge compute.
- Portable low SWAP (size, weight, and power) system. Can be moved and installed single-handedly.
- High spectral resolution data capturing insights not possible with traditional or multispectral systems.
- Designed with interoperability and systems integration as a core feature.

Development Kit

Providing the full stack of tooling: hardware, software and examples for a rapid start to specific use case exploration.

Combines the latest ML models for traditional imaging and hyperspectral material identification using synchronized data streams from the LO camera. Packaged with a Python development environment and NVIDIA GPU in a portable processing unit, users can evaluate algorithms and live-stream outputs to any networked device.

Collaboration

Living Optics works with the National Security community. We develop solutions founded on trust and experimentation and provide examples to illustrate the feasibility and utility of tactical hyperspectral video rate perception.

Applications

- Camouflage or low-observable material detection
- Detecting signs of material damage, wear, structural composition and integrity
- Anomaly detection, including inconsistencies and unknown spectral signatures
- High-confidence target identification, tracking and reacquisition

Missions

- ISR and ISTAR
- Search and rescue, personnel recovery
- EOD&S
- Repair and maintenance
- Inspection and quality control

Modalities

- Dismounted, direct or remote
- Mounted or integrated into ground, surface or air systems.
- Human or autonomous control

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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