POLVISION

Revealing the Invisible: Real-Time Full-Stokes Polarization Camera

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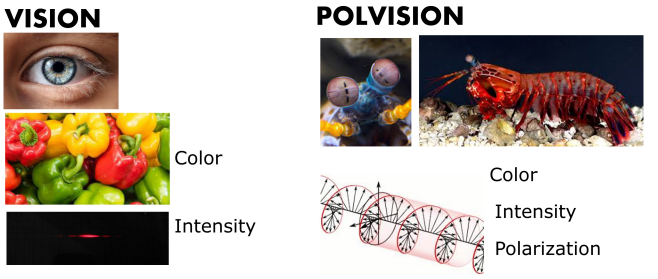
The Problem: Blind Spots in Imaging

Standard cameras are blind to polarization. Traditional methods to capture the complete polarization state (all four Stokes parameters) require complex, bulky, and slow optical setups.

To solve this, researchers from the **University of Barcelona (UB)** developed a compact, real-time Full-Stokes camera that mimics the advanced vision of certain underwater animals.

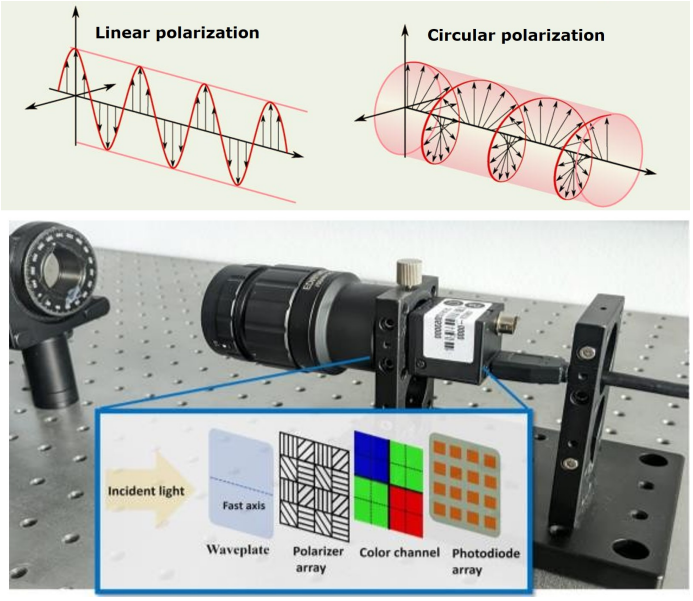


Normal vision is sensitive to intensity and color. Polvision can also detect and quantify any polarization.

The Solution: Single-Shot Precision

Polvision integrates a proprietary dispersive retarder to convert color sensors into powerful polarization tools. The patented system captures all 4 Stokes parameters S_0, S_1, S_2, and S_3 in a single shot.

- **Plug & Play:** Compatible with existing optical systems.
- **Real-Time:** Operates up to **75 fps**, enabling dynamic video analysis.
- **Cost-Effective:** No moving parts, reducing complexity and manufacturing costs.



The compact Full-Stokes Polvision system. Capable of detecting linear and circular polarizations.

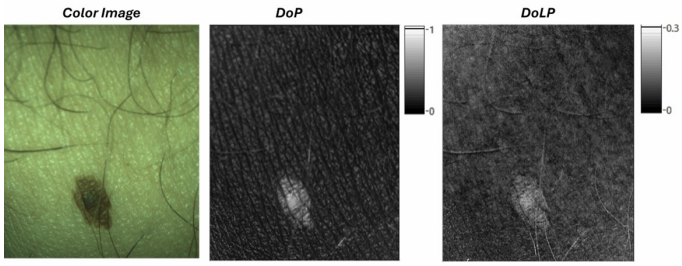
Market Applications

- **Industrial Inspection:** Stress analysis, defect detection, and material characterization.
- **Robotics & Autonomous Systems:** Navigation in transparent or reflective environments (glass, water).
- **Autonomous Driving:** Enhanced safety via detection of black ice and hazardous road conditions.
- **Biomedical Imaging:** Glare-free endoscopy and tissue differentiation.
- **Underwater Vision:** De-hazing and improved contrast in scattering media.
- **Remote Sensing:** Material classification and camouflage breaking.
- **Scientific Research:** Advanced polarization measurements.

Featured Application: Dermoscopy

Traditional dermatoscopes struggle with surface glare. Polvision uses circular polarization to eliminate reflections and "see" beneath the skin.

- **Instant Diagnosis:** Differentiates benign vs. malignant lesions via DoLP signals.
- **Clearer Imaging:** Visualizes collagen structures invisible to the naked eye.
- **Skin age:** Evaluates epidermis thickness which degrades with skin age.



Enhanced contrast in dermoscopy.

THE TEAM: Experts in Light & Photonics

A spin-off project from the PLAT Group (UB).

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BUSINESS OPPORTUNITY: We are seeking partners for commercial exploitation via licensing or joint development to bring this technology to the market.

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