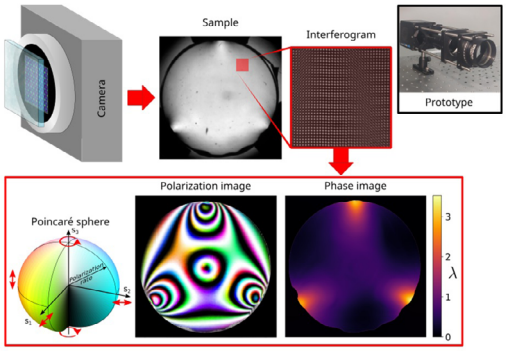
MULTIPLEXED POLARIMETRIC WAVEFRONT IMAGER

This technology enables quantitative full polarimetric and wavefront sensing within a single camera and from a single image acquisition.

PRESENTATION

We propose a highly multimodal, multiplexed and high-resolution imager. Measuring polarization or wavefront of a light beam typical requires several intensity measurements. In this technology, a birefringent grating is placed in the close vicinity of a camera chip. This mask was engineered and optimized so as to encode both full Stokes polarimetric information and wavefront information into a intensity interferogram. Proper information unmixing of the captured image, relying on pre-registered calibration interferometric patterns, provides five complementary high-resolution images carrying both the polarization state and the wavefront of the light beam.



Full-Stokes polarimetric imaging - Quantitative phase imaging
Wavefront sensor - Wetrology

APPLICATIONS

- Machine vision applications : decamouflage, target detection, surface texture detection
- Metrology : metasurfaces, quantitative photo-elasticimetry
- Microscopy : quantitative phase & polarization microscopy, polarization resolved super-resolution microscopy

INTELLECTUAL PROPERTY

- POLARIMETRIC PHASE IMAGING, Marc Guillon, Baptiste Blochet, Miguel Alonso, Pascal Berto, applied on Jan. 2023, PCT 02/02/2024

COMPETITIVE ADVANTAGES

- Multiplexing both polarimetric and phase images in a single instrument and in a single acquisition step
- Full Stokes polarimetric imaging (in contrast to PolarsensTM by Sony)
- Quantitative & single-shot
- Compact & robust

PUBLICATIONS

- B. Blochet, G. Lelu, M.A. Alonso, M. Guillon, *a polarimetric wavefront sensor*, Optica 12(7), 907-913 (2025)

DEVELOPMENT PHASE

- ☑ The technology was validated for decamouflage, for optics and metasurface metrology and quantitative microscopy. The system currently comprises a re-imaging system between the mask and the camera. Embeded data processing could also be beneficial for some applications and is currently under development.

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LABORATORIES

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