Polarimetric Camera Calibration Using an LCD Monitor
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Problem Definition and Contribution

Goal: Jointly calibrating the polarizer angles \( \{\phi_k\}^N_{k=1} \) and the inverse CRF \( g(\cdot) \) with only the knowledge of measured intensity M, s.t.,
\[
g(M_{k,p}) = I_p + a_p \cos 2(\phi_k - \psi_p).
\]

Motivation:

Main Idea

Characteristics of LCD Monitors:

Method

Flowchart:

Experiments & Results

Real-world Experiments:

(a) Results under different environment illumination settings.

(b) Comparison of different patterns (P0: Checkerboard).

(c) Comparison of separate and joint processes.

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Simulation (sensitivity analysis)

Real-world Experiments (Comparison):

Experiments & Results

LCD screens with a touch panel:

References:

2. Schechner, Self-calibrating imaging polarimetry. ICCP15
3. Teo et al. Self-calibrating polarisation radiometric calibration. CVPR18

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LCDs’ suitability: