Docket #: S22-135

Eliminating Crosstalk by Rearranging Patterned Thin-Film Filters on Image Sensor

A Stanford researcher has developed a simple hardware solution to eliminate a newly identified form of optical 'crosstalk' on image sensors. Three types of crosstalk are commonly identified in image sensors: electrical (diffusing electrons), optical (light arriving at the wrong pixel) and spectral (poor filtering). All three forms of crosstalk reduce spatial and/or spectral resolution, which lowers the commercial value of the camera.

This Stanford innovation addresses a newly identified form of optical crosstalk, unique to image sensors with patterned thin-film filters. The researcher discovered that cavity crosstalk occurs because the filters are made with highly reflective mirrors, which can trap and transport light to neighbouring pixels. The novel, low-cost hardware solution he developed eliminates this crosstalk by rearranging the patterned thin-film filters. The two main applications for this work are spectral imaging and miniature spectrometers.

Figure:

Image from Inventor

Stage of Development – Proof of Concept

Applications

- **Spectral imaging** – improving sensor performance and enhancing adoption across domains (e.g., precision agriculture, quality control, medical imaging and diagnostics, etc.)
- **Miniature spectrometers** – which are currently being integrated in smartphones and other diagnostic devices.

Advantages

- **Low cost, easily implemented** solution
- Root cause resolution of crosstalk in patterned thin-film filters

Publications

- Goossens, T. (2022). "Crosstalk elimination by rearranging thin-film filters. *Optics Letters, 47*(15), 3920-3923.

Patents

- Published Application: WO2023220464

Innovators

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