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NEARLY TRANSPARENT IMAGING SYSTEM

HARDWARE, CIRCUITS, & SENSORS

Lens-less, nearly transparent optical sensor for computational generation of images.

TECHNOLOGY TYPE

Optical Sensors
Imaging
Software

STAGE OF DEVELOPMENT

- Proof of concept demonstrated using a diffractive filter and CMOS sensor.

- Prototype and algorithms in development.

- Optimization of imaging performance still required.

IP PROTECTION

Nationalized PCT Pending in the United States
Lensless Imaging Device
WO2018064660A1
PCT Pending

LEARN MORE

Reference Numbers: U-6193, U-6401

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TECHNOLOGY SUMMARY

Traditional imaging methods, which are relatively costly and complex, rely on a lens to focus light onto a sensor that records photons.

The proposed invention uses an image recording device placed at the edges of a transparent layer to accurately reproduce an image. A small fraction of the light from the outside scene scatters off imperfections in the transparent layer to reach the image-recording device. The full scene is reproduced computationally from the point sources. The image is captured without a lens and without a direct line of sight to the scene. While the system could be used to capture any image, it is applicable specifically to biometrics and automotive machine vision.

FEATURES AND BENEFITS

- Enables lens-less imaging.
- Provides a lighter, less expensive form factor for cameras.
- Facilitates imaging around corners and obstacles.
- Improves imaging that involves rigid, transparent surfaces of various geometries.

RECENT PUBLICATIONS

Kim, G., Isaacson, K., Palmer, R., Menon, R. (2017). Ultra-thin lensless camera using a bare sensor and computational techniques. *Imaging and Applied Optics 2017 (3D, AIO, COSI, IS, MATH, pcAOP)*. doi: 10.1364/cosi.2017.ctu3b.4
Kim, G., Isaacson, K., Palmer, R., Menon, R. (2017). Lensless photography with only an image sensor. *Applied Optics*. 56(23), 6450. doi: 10.1364/ao.56.006450

INVENTOR PROFILE

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