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Metasurface, Metalens, and Metalens Array with Controllable Angular Field-of-View

Tech ID: 33802 / UC Case 2021-677-0

ABSTRACT

Researchers at the University of California, Davis have developed an optical lens module that uses a metalens or a metalens array having a controllable angular field-of-view.

FULL DESCRIPTION

The technology uses a metalens or a metalens array to achieve high quality large field-of-view imaging with a compact device. Each metalens or metalens array uses a 2D array of meta-units where each meta-unit includes a nanostructure and a portion of a substrate that supports the nanostructure. Each meta-unit is configured with an angular-dependent transmission or reflection intensity that decreases with an increasing incident angle of an illumination. The metalens passes an incident light having an incident angle less than a cutoff angle and rejects an incident light having an incident angle greater than the cutoff angle. The metalens can be used as a base unit for constructing many different metasurfaces designed to achieve various 2D or 3D imaging goals.

APPLICATIONS

- ▶ Miniaturized imaging devices
- ▶ Light-field cameras
- ▶ Compact cameras
- ▶ Endoscopy
- ▶ Biomedical imaging
- ▶ Consumer electronics
- ▶ Surveillance

FEATURES/BENEFITS

- ▶ Design flexibility
- ▶ Angle-dependent transmission or reflection intensity
- ▶ Extended depth of view for light field imaging
- ▶ Solves the trade-off between in-focus imaging resolution and the depth of view
- ▶ Addresses signal ambiguities in single lens design

PATENT STATUS

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Reference for National Filings	WO 2023/283348	01/12/2023	2021-677

Patent Pending

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OTHER INFORMATION

KEYWORDS

metalens, compact and large field of view imaging, light field imaging, photonic device

CATEGORIZED AS

- ▶ **Optics and Photonics**
 - ▶ All Optics and Photonics
- ▶ **Imaging**
 - ▶ 3D/Immersive
 - ▶ Medical
 - ▶ Other
- ▶ **Medical**
 - ▶ Imaging
- ▶ **Nanotechnology**
 - ▶ Materials
 - ▶ Other
 - ▶ Tools and Devices
- ▶ **Sensors & Instrumentation**
 - ▶ Scientific/Research

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