

Method For Mid-Infrared Imaging In Si-Based Cameras Through Non-Degenerate Two-Photon Absorption

Tech ID: 32353 / UC Case 2020-638-0

BRIEF DESCRIPTION

Researchers at UCI have developed a novel method to combine common CCD (charge-coupled device) cameras with mid-infrared (MIR) technology in order to create an affordable and accessible spectroscopic camera for biochemical imaging.

SUGGESTED USES

·Affordable and efficient method for biomedical mapping of tissues, inspection of industrial ceramics, stand-off detection of materials, mineral sensing and environmental monitoring.

FEATURES/BENEFITS

- Addition of near-infrared (NIR) beam (along with MIR) onto CCD chip, renders the CCD camera sensitive to MIR light
- Si-based CCD cameras are far more affordable, available and efficient for MIR imaging systems

TECHNOLOGY DESCRIPTION

Mid-infrared (MIR) spectroscopic imaging is of particular interest for a number of fields including biomedical mapping of tissue, inspection of industrial ceramics, environmental monitoring, etc. However, since MIR cameras are based on low band-gap materials, they are prone to thermally induced electronic noise, which renders them less practical and affordable. For these concerns, development of more affordable cameras could lead to a breakthrough in the MIR imaging field.

The researchers at the University of California, Irvine, invented Si-based charge-coupled device (CCD) camera that utilizes mid-infrared (MIR) technology to permit 3D chemical imaging in biomedical, engineering and environmental settings. The CCD based MIR sensor takes advantage of the non-degenerate two-photon absorption (NTA) process that benefits from a mature Si-detector technology offers a better alternative to current commercial devices.

PATENT STATUS

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Published Application	2021/195273 A1	09/30/2021	2020-638

Additional Patent Pending

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INVENTORS

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OTHER INFORMATION

CATEGORIZED AS

- » **Optics and Photonics**
 - » All Optics and Photonics
- » **Imaging**
 - » 3D/Immersive
 - » Medical
 - » Molecular
 - » Other
 - » Security
- » **Medical**

STATE OF DEVELOPMENT

The researchers at UCI have recorded real-time MIR videos of living organisms.

- » [Diagnostics](#)
- » [Imaging](#)
- » [Research Tools](#)
- » **[Research Tools](#)**
- » [Other](#)
- » **[Security and Defense](#)**
- » [Food and Environment](#)
- » [Screening/Imaging](#)

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ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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