COMPACT CATADIOPTRIC MAPPING OPTICAL SENSOR FOR PARALLEL GONIOPHOTOMETRY

Tech ID: 33598 / UC Case 2024-148-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

Goniophotometers measure the luminance distribution of light emitted or reflected from a point in space or a material sample. Increasingly there is a need for such measurements in real-time, and in real-world situations, for example, for daylight monitoring or harvesting in commercial and residential buildings, design and optimization of greenhouses, and testing laser and display components for AR/VR and autonomous vehicles, to name a few. However, current goniophotometers are ill-suited for real-time measurements; mechanical scanning goniophotometers have a large form factor and slow acquisition times. Parallel goniophotometers take faster measurements but suffer from complexity, expense, and limited angular view ranges (dioptric angular mapping systems) or strict form factor and sample positioning requirements (catadioptric angular mapping systems). Overall, current goniophotometers are therefore limited to in-lab environments.

To overcome these challenges, UC Berkeley researchers have invented an optical sensor for parallel goniophotometry that is compact, cost-effective, and capable of real-time daylight monitoring. The novel optical design addresses key size and flexibility constraints of current state-of-the-art catadioptric angular mapping systems, while maximizing the view angle measurement at 90°. This camera-like, angular mapping device could be deployed at many points within a building to measure reflected light from fenestrations, in agricultural greenhouses or solar farms for real-time monitoring, and in any industry benefitting from real-time daylight data.

SUGGESTED USES

» Real-time daylight monitoring of commercial and residential buildings, e.g., Smart homes
» Alternative to goniophotometers/conoscopes in the display and lighting industry, including AR/VR and autonomous vehicle applications
» Greenhouse or solar farm monitoring and control

ADVANTAGES

» Camera-like, deployable form factor
» More compact and cost-effective than state-of-the art dioptric and catadioptric mapping systems
» Capable of real-time daylight monitoring

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INVENTORS

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OTHER INFORMATION

CATEGORIZED AS

» **Optics and Photonics**
» All Optics and Photonics
» **Agriculture & Animal Science**
» Other
» Processing and Packaging
» **Biotechnology**
» Food
» Industrial/ Energy
» Other
» **Energy**
» Lighting
» Other
» Solar
» **Environment**
» Other
» **Engineering**
» Engineering
» **Imaging**
» Other
» Remote Sensing

RELATED MATERIALS

- » **Materials & Chemicals**
  - » Thin Films
- » **Semiconductors**
  - » Testing
- » **Sensors & Instrumentation**
  - » Analytical
  - » Environmental Sensors
  - » Other
  - » Physical Measurement
  - » Scientific/Research

RELATED CASES

2024-148-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ Portable Cyber-Physical System For Real-Time Daylight Evaluation In Buildings

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