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Accession number:20120314695529
Title:Spinning disk for compressive imaging
Authors:Shen, H. (1); Gan, L. (2); Newman, N. (1); Dong, Y. (1); Li, C. (1); Huang, Y. (1); Shen, Y.C. (1)
Author affiliation:(1) Department of Electrical Engineering and Electronics, University of Liverpool, Liverpool L69 3GJ, United Kingdom; (2) Electronic and Computer Engineering, Brunel University, Uxbridge UB8 3PH, United Kingdom
Corresponding author:Shen, Y.C.(ycshen@liverpool.ac.uk)
Source title:Optics Letters
Abbreviated source title:Opt. Lett.
Volume:37
Issue:1
Issue date:January 1, 2012
Publication year:2012
Pages:46-48
Language:English
ISSN:01469592
E-ISSN:15394794
CODEN:OPLEDP
Document type:Journal article (JA)
Publisher:Optical Society of America, 2010 Massachusetts Avenue NW, Washington, DC 20036-1023, United States
Abstract:We report the first, to the best of our knowledge, experimental implementation of a spinning-disk configuration for high-speed compressive image acquisition. A single rotating mask (i.e., the spinning disk) with random binary patterns was utilized to spatially modulate a collimated terahertz (THz) or IR beam. After propagating through the sample, the THz or IR beam was measured using a single detector, and THz and IR images were subsequently reconstructed using compressive sensing. We demonstrate that a 32-by-32 pixel image could be obtained from 160 to 240 measurements in both the IR and THz ranges. This spinning-disk configuration allows the use of an electric motor to rotate the spinning disk, thus enabling the experiment to be performed automatically and continuously. This, together with its compact design and computational efficiency, makes it promising for real-time imaging applications. © 2011 Optical Society of America.
Number of references:17
Main heading:Computational efficiency
Controlled terms:Infrared imaging
Uncontrolled terms:Binary patterns - Compact designs - Compressive imaging - High-speed - IR images - Pixel images - Realtime imaging - Spinning disks - Terahertz
Classification code:746 Imaging Techniques - 921 Mathematics
DOI:10.1364/OL.37.000046
Database:Compendex