101
Accession number:20123715436460
Title:Optimization-based terahertz imaging
Authors:Tsai, Hsiao-Rho (1); Enderli, Florian (2); Feurer, Thomas (2); Webb, Kevin J. (1)
Author affiliation:(1) School of Electrical and Computer Engineering, Purdue University, West Lafayette, IN 47907-2035, United States; (2) Institute of Applied Physics, University of Bern, CH-3012 Bern, Switzerland
Corresponding author:Tsai, H.-R.
Source title:IEEE Transactions on Terahertz Science and Technology
Abbreviated source title:IEEE Trans. Terahertz Sci. Technolog.
Volume:2
Issue:5
Issue date:2012
Publication year:2012
Pages:493-503
Article number:6290430
Language:English
ISSN:2156342X
Document type:Journal article (JA)
Publisher:IEEE Microwave Theory and Techniques Society, 2458 East Kael Circle, Mesa, AZ 85213, United States
Abstract:A terahertz (THz) imaging modality based on nonlinear optimization that is not limited by weak scatter or low refractive index is presented. Two-dimensional reconstructions of sub-wavelength dielectric cylinders in air are performed through iterative coordinate descent (ICD) optimization in a Bayesian framework using experimental data obtained by illuminating the objects with a THz beam. Strategies for avoiding local minima and to allow for faster convergence and improved image quality are presented and evaluated. © 2011-2012 IEEE.
Number of references:26
Main heading:Optimization
Controlled terms:Dielectric devices - Refractive index
Uncontrolled terms:Bayesian frameworks - Dielectric cylinder - Experimental data - Faster convergence - Iterative coordinate descents - Local minimums - Low refractive index - Non-linear optimization - Sub-wavelength - Terahertz imaging
Classification code:704 Electric Components and Equipment - 714 Electronic Components and Tubes - 741.1 Light/Optics - 921.5 Optimization Techniques
DOI:10.1109/TTHZ.2012.2208192
Database:Compendex