Fringe Pattern Analysis for Optical Metrology. Theory, Algorithms, and Applications

Description: This book presents the theoretical principles and practical applications for classical and advanced interferometry in optical–metrology. A major novelty of this work is the use of the Frequency Transfer Function (FTF) and the theory of Stochastic Process in fringe pattern analysis. These mathematical tools better describe the phase demodulation algorithms with desired spectral response, detuning insensitivity, signal-to-noise robustness and harmonic rejection.

From the contents:
- Digital Linear Systems
- Synchronous Temporal Interferometry
- Asynchronous Temporal Interferometry
- Spatial Methods with Carrier
- Spatial Methods without Carrier
- Phase Unwrapping
- List of 40 Phase-Shifting Algorithms

Contents:

Chapter 1 Digital Linear Systems

1.1 Introduction

1.2 Digital Sampling

1.3 Linear time-invariant (LTI) systems

1.4 Z-transform analysis of digital linear systems

1.5 Fourier analysis of digital linear systems

1.6 Convolution one-dimensional digital filters

1.7 Convolution two-dimensional linear filters

1.8 Linear regularized filtering techniques

1.9 Stochastic processes

1.10 Linear quadrature filters

Chapter 2 Synchronous Temporal Interferometry

2.1 Introduction

2.2 The temporal carrier interferometric signal

2.3 Quadrature linear filters for phase estimation

2.4 The minimum 3-step PSA

2.5 Least-squares PSAs

2.6 Detuning in temporal interferometry

2.7 Noise in temporal interferometry
2.8 Harmonics in temporal interferometry
2.9 Quadrature filters design by 1st-order building blocks
2.10 Some further topics in linear PSAs theory

Chapter 3 Asynchronous Temporal Interferometry
3.1 Introduction
3.2 Spectral analysis of the Carré algorithm
3.3 Spectral analysis of other self-tunable PSAs
3.4 Self-calibrating PSAs

Chapter 4 Spatial Methods with Carrier
4.1 Introduction
4.2 Linear spatial carrier
4.3 Circular spatial carrier interferogram
4.4 2D Pixelated Spatial Carrier
4.5 Regularized Quadrature Filters
4.6 Relation Between Temporal and Spatial Analysis

Chapter 5 Spatial Methods without Carrier
5.1 Introduction
5.2 Phase demodulation of closed-fringe interferograms
5.3 The Regularized Phase Tracker (RPT)
5.4 Local Robust Quadrature Filters
5.5 2D Fringe Direction
5.6 2D Vortex Filter
5.7 The General Quadrature Transform

Chapter 6 Phase Unwrapping
6.1 Introduction
6.2 Phase unwrapping with by 1D line integration
6.3 Phase unwrapping with 1D IIR filters
6.4 1D phase unwrapping with linear prediction
6.5 2D phase unwrapping with linear prediction
6.6 Least-squares method for phase unwrapping
6.7 Phase unwrapping through demodulation using a phase tracker
6.8 Smooth unwrapping with 2D detection of phase inconsistencies
6.9 Quality Maps and Branch Cut Methods

Appendix

List of linear phase-shifting algorithms (PSAs)

Ordering:

Order Online - http://www.researchandmarkets.com/reports/2755178/

Order by Fax - using the form below

Order by Post - print the order form below and send to

Research and Markets,
Guinness Centre,
Taylors Lane,
Dublin 8,
Ireland.
Fax Order Form
To place an order via fax simply print this form, fill in the information below and fax the completed form to 646-607-1907 (from USA) or +353-1-481-1716 (from Rest of World). If you have any questions please visit http://www.researchandmarkets.com/contact/

Order Information
Please verify that the product information is correct.

Product Name: Fringe Pattern Analysis for Optical Metrology. Theory, Algorithms, and Applications
Web Address: http://www.researchandmarkets.com/reports/2755178/
Office Code: SCDKUQZ9

Product Format
Please select the product format and quantity you require:

Quantity
Hard Copy (Hard Back): USD 166 + USD 29 Shipping/Handling

* Shipping/Handling is only charged once per order.

Contact Information
Please enter all the information below in BLOCK CAPITALS

Title: Mr ☐ Mrs ☐ Dr ☐ Miss ☐ Ms ☐ Prof ☐
First Name: ___________________________ Last Name: ___________________________
Email Address: * ___________________________
Job Title: ___________________________
Organisation: ___________________________
Address: ___________________________
City: ___________________________
Postal / Zip Code: ___________________________
Country: ___________________________
Phone Number: ___________________________
Fax Number: ___________________________

* Please refrain from using free email accounts when ordering (e.g. Yahoo, Hotmail, AOL)
Payment Information

Please indicate the payment method you would like to use by selecting the appropriate box.

☐ Pay by credit card: You will receive an email with a link to a secure webpage to enter your credit card details.

☐ Pay by check: Please post the check, accompanied by this form, to:
Research and Markets,
Guinness Center,
Taylors Lane,
Dublin 8,
Ireland.

☐ Pay by wire transfer: Please transfer funds to:
Account number 833 130 83
Sort code 98-53-30
Swift code ULSBIE2D
IBAN number IE78ULSB98533083313083
Bank Address Ulster Bank,
27-35 Main Street,
Blackrock,
Co. Dublin,
Ireland.

If you have a Marketing Code please enter it below:

Marketing Code: ____________________________

Please note that by ordering from Research and Markets you are agreeing to our Terms and Conditions at http://www.researchandmarkets.com/info/terms.asp

Please fax this form to:
(646) 607-1907 or (646) 964-6609 - From USA
+353-1-481-1716 or +353-1-653-1571 - From Rest of World