

Proceedings of SPIE—The International Society for Optical Engineering

Volume 557

International Conference on Automatic Inspection and Measurement

**Richard A. Brook, Michael J. W. Chen
Chairmen/Editors**

Cosponsored by
Sira Ltd.—The Research Association for Instrumentation

Cooperating Organizations
**Optical Sciences Center/University of Arizona
Institute of Optics/University of Rochester**

**August 20–21, 1985
San Diego, California**

Published by
**SPIE—The International Society for Optical Engineering
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone 206/676-3290 (Pacific Time) • Telex 46-7053**

SPIE (The Society of Photo-Optical Instrumentation Engineers) is a nonprofit society dedicated to advancing engineering and scientific applications of optical, electro-optical, and optoelectronic instrumentation, systems, and technology.

INTERNATIONAL CONFERENCE ON AUTOMATIC INSPECTION AND MEASUREMENT

Volume 557

Contents

Conference Committee	iv
Introduction	v
SESSION 1. IMAGE ACQUISITION SYSTEMS AND SENSORS	1
557-01 Development of an automated image shearing microscope for measuring the critical dimensions of magnetic recording heads , C. P. Kirk, Leeds Univ. (UK); R. W. Gale, Vickers Instruments (UK)	2
557-02 Design of robot hand-based intelligent sensor for measuring six DOF force/torque information , R. C. Luo, North Carolina State Univ.; M. J. W. Chen, Machine Intelligence Corp.	10
557-03 Stress sensor , J. R. Hodor, H. J. Decker, Jr., J. Barney, J. H. Green, Lockheed Missiles and Space Co., Inc.	16
557-04 Hardware for high speed boundary encoding from large line scanned images , G. A. W. West, T. J. Ellis, W. J. Hill, City Univ./London (UK).	24
557-05 A practical architecture for machine vision based measurement and inspection , E. Panofsky, D. McGhie, Machine Intelligence Corp.	34
SESSION 2. INTEGRATED SYSTEM DESIGN	43
557-07 Intelligent visual inspection machines , R. Thibadeau, J. Gabrick, Carnegie-Mellon Univ.	44
557-08 An automatic visual alignment and inspection station for Tape Automated Bonding (TAB) products , G. J. Gleason, T. Pandolfi, R. R. Ames, M. J. W. Chen, Machine Intelligence Corp.	50
557-09 SAIL—a high level programming language translator for visual inspection of industrial assemblies , C. Tsatsoulis, K.-s. Fu, Purdue Univ.	59
557-25 Multiprocessor architectures for automated inspection systems , B. Andrews, KLA Instruments Corp.	64
557-10 A digital wafer image and geometry processor , G. Huang, D. Wang, E. Huang, C. Huang, Vision Inc. (China).	70
557-11 SMV—a computer vision program for loading surface mount components , N. S. Chang, Hewlett Packard Labs.	76
557-12 Optimal utilization of a state-of-the-art machine vision architecture , A. I. Coriat, International Imaging Systems.	81
SESSION 3. INFORMATION PROCESSING	89
557-13 High-speed processing for automatic visual inspection and measurement , P. Suetens, A. Oosterlinck, Catholic Univ. of Leuven (Belgium); M. J. W. Chen, Machine Intelligence Corp.	90
557-14 Turnkey optical inspection systems: getting what you want , B. D. Figler, Aerodyne Products Corp.	103
557-15 Description of a new high accuracy method of angle measurement by multireflected autocollimation , M. Shechterman, EL-OP Electro Optical Industries Ltd. (Israel).	109
557-16 Measures of circularity for automatic inspection applications , J. Illingworth, J. Kittler, SERC Rutherford Appleton Lab. (UK).	114
557-06 A microprogrammable processor for image operations , J. Rommelaere, L. Van Eycken, P. Wambacq, A. Oosterlinck, Catholic Univ. of Leuven (Belgium).	123
SESSION 4. INDUSTRIAL NEEDS AND CASE STUDIES	131
557-19 Investigation on the second optical inspection of ICs , G. Schreurs, E. Bellon, M. Vercruyssen, A. Oosterlinck, Catholic Univ. of Leuven (Belgium).	132
557-20 Real-time automatic inspection of web materials , S. McKaughan, Aerodyne Products Corp.	140
557-21 Automated inspection of magnetic media by laser scanning , P. Lilienfeld, S. Broude, E. Chase, G. Quackenbos, GCA Corp.	146
557-22 Remote visual inspection of nuclear fuel pellets with fiber optics and video image processing , F. W. Moore, Westinghouse Hanford Co.	154
557-23 On-line visual inspection of automobile display panels , R. M. Atkinson, J. F. Claridge, S. R. Hattersley, J. C. Taunton, Sira Ltd. (UK).	161
557-24 On the forecasting of lathe cutting dynamics , N. Olgac, G. Zhao, Univ. of Connecticut.	167
Addendum	175
Author Index	176