

List of Contents

Chapter 1 MATHEMATICAL ASPECTS

On Regularization Methods within System Identification H.G. Natke (University of Hannover/Germany)	3
New Approaches to the Optimal Regularization T. Kitagawa (University of Tsukuba/Japan) Y. Hosoda (Nagoya University/Japan)	21
A Method for Solving Inverse Boundary-Value Problems Using Symbolic Computation K. Yoda (Mitsubishi Electric Corporation/Japan)	27
An Application of the Fuzzy Control for an Ill-posed Problem H. Imai (University of Tsukuba/Japan) A. Sasamoto (Mechanical Engineering Laboratory/Japan) H. Kawarada (University of Chiba/Japan) M. Natori (University of Tsukuba/Japan)	31
Inverse Filtering for Reverberant Transfer Functions M. Tohyama (NTT Human Interface Laboratory/Japan) R.H. Lyon (Massachusetts Institute of Technology/USA) T. Koike (NTT Advanced Technology/Japan)	39

Chapter 2 COMPUTATIONAL ASPECTS

Classification of Inverse Problems Arising in Field Problems and Their Treatments S. Kubo (Osaka University/Japan)	51
A Physically Based Method of Experimental Data-Concepts, Formulation and Application to Identification of Residual Stresses W. Karmowski, J. Orkisz (Technical University of Cracow/Poland)	61
Inverse Problems for Vibrating Systems in Two and Three Dimensions G.M.L. Gladwell (University of Waterloo/Canada) B. Zhu (Shandong University/China)	71
Inverse Spectrum Problems for Block Jacobi Matrix B. Zhu (Shandong University/China) K.R. Jackson (University of Toronto/Canada) R.P.K. Chan (University of Auckland/New Zealand)	81
Parametric Correction of Finite Element Models Using Modal Tests P. Ladeveze, M. Reynier, D. Nedjar (Universite Paris VI/France)	91

Structural Defect Synthesis Using Noise-Frequency Response Characteristics for Coupled Acoustic-Structural System by Fuzzy Inference Method W. Kozukue, I. Hagiwara (Nissan Motor Co., Ltd./Japan)	101
Inverse Problem Solution in Non-destructive Pavement Diagnostics -Computational Aspects B. Novotny (Solvak Academy of Sciences/Slovakia).....	111
Inverse Formulation for Incompressible Viscous Two-Dimensional and Axisymmetric Flow Problems T. Tsukiji (Ashikaga Institute of Technology/Japan)	121

Chapter 3 PARAMETER IDENTIFICATION

Requirements for the Structure of Analytical Models Used for Parameter Identification M. Link (University of Kassel/Germany).....	133
Inverse Problem in Mechanics of Structures: a New Approach Based on Displacement Field Processing M. Grediac, C. Toukourou, A. Vautrin (Ecole des Mines de Saint-Etienne/France).....	147
New Method for Determining Contact Pressure Distributions by Using Caustic Images K. Sato (Chiba University/Japan) T. Yamaya (Japan Air System/Japan)	159
Estimation of Impact Force by an Inverse Analysis H. Inoue, K. Kishimoto, T. Shibuya, T. Koizumi (Tokyo Institute of Technology/Japan).....	169
Optimality of Internal Structure and Identification of Unknown Load Y. Tada (Kobe University/Japan) M. Kamada (Nippon Steel Corporation/Japan)	179

Chapter 4 SHAPE DETERMINATION AND OPTIMIZATION

Shape Identification Using Acoustic Measurements: A Numerical Investigation Using BIE and Shape Differentiation M. Bonnet (Ecole Polytechnique/France).....	191
Shape Determination of a Scattering Obstacles by Eigenfunction Expansion Embedding Integral Method T. Fukui (Fukui University/Japan)	201
Indentification of Crack Shape Hidden in Solid by Means of Neural Network and Computational Mechanics G. Yagawa, S. Yoshimura, Y. Mochizuki, T. Oishi (University of Tokyo/Japan).....	213
Approximate Recovery and Redesign of a Curved Surface Based on a Flattened Form T. Shimada (University of Marketing & Distribution Sciences/Japan) Y. Tada (Kobe University/Japan).....	223

Optimum Design of a Sound-Insulating Wall by the Boundary Element Method M. Tanaka, T. Matsumoto, M. Shirotori (Shinshu University/Japan)	233
Optimal Design of Cooling Lines of Injection Mold Based on Boundary Element Design Sensitivity Analysis T. Matsumoto, M. Tanaka, H. Hirata (Shinshu University/Japan).....	243
Efficient Shape Optimization Technique Based on Boundary Element Method K. Yamazaki, J. Sakamoto (Kanazawa University/Japan)	253
Chapter 5 MATERIAL PROPERTY CHARACTERIZATION	
Inversion of Surface Acoustic Wave Data to Determine the Elastic Constants of Nitride Films J.D. Achenbach, J.O. Kim (Northwestern University/USA).....	265
Inversion of Source, Material, and Defect Characteristics Using Guided Waves S.K. Datta (University of Connecticut/USA) T.H. Ju (University of Colorado/USA).....	277
Inverse Problems Associated with Nondestructive Evaluation of Plastic Damages in Solids T. Mura, T. Koya, S.C. Hsieh (Northwestern University/USA) Z.A. Moschovidis (Amoco Production Co./USA) Z. Gao (Clarkson University/USA).....	291
Identification Aspects of Inhomogeneous Materials M.A.N. Hendriks (TNO Building and Construction Research/The Netherlands) C.W.J. Oomen (Eindhoven University of Technology/The Netherlands).....	301
A Parameter Identification Procedure as a Dual Boundary Control Concept for Wave-Propagation Problem Y. Ichikawa, T. Kyoya (Nagoya University/Japan) T. Ohkami (Shinshu University/Japan) X. Wu (Nagoya University/Japan).....	311
Identification of Dynamic In Situ Soil Properties at Existing Structure Site K. Matsui (Tokyo Denki University/Japan) M. Matsushima (Tokyo Electric Power Service Co. Ltd./Japan) S. Ohtaki (Tokyo Denki University/Japan).....	319
Characterization of the Damping Effect of a Vibrating System S. Audebert, H. Andriambololona (Electricite de France/France)	327
Identification of Parameters in Geomechanics Using a Maximum Likelihood Approach A. Ledesma, A. Gens, E.E. Alonso (Technical University of Catalonia/Spain).....	337
Identification Analysis of Distributed-Parameter Systems by Using Kalman Filter-Boundary Element Method A. Utani, N. Tosaka (Nihon University/Japan).....	347

Chapter 6 ELASTODYNAMIC INVERSE PROBLEMS

Inverse Scattering for Flaw Type Classification S. Hirose (Okayama University/Japan).....	359
Shape Inversion from Phase Shifts M. Kitahara (Tokai University/Japan) K. Nakagawa (Total System Institute/Japan).....	367
Determination of Shapes, Sizes and Material Compositions of Large Inclusions in Elastic Media from Scattered Waves Y.M. Chen (State University of New York at Stony Brook/USA)	377
Estimation of Unknown Boundary Values by Inverse Analysis with Elastodynamic Boundary Element Method M. Tanaka, M. Nakamura, R. Ochiai (Shinshu University/Japan).....	383
Source Inversion of High-Frequency Strong Motion Records in the Near-Source Region M. Iida (University of Tokyo/Japan) S. Hartzell (United States Geological Survey/USA)	393
Optimum Strong-Motion Station-Array Geometry for Earthquake Source Studies M. Iida (University of Tokyo/Japan).....	403

Chapter 7 ULTRASONIC NONDESTRUCTIVE EVALUATION

Neural Network Approach to the Inverse Problem of Crack- Depth Determination from Ultrasonic Backscattering Data M. Takadoya, M. Notake (Mitsubishi Research Institute/Japan) M. Kitahara(Tokai University/Japan) J.D. Achenbach, Q.C. Guo, M.L. Peterson (Northwestern University/USA)	413
Simulation of Directivity Synthesis for Ultrasonic Transducers T. Tsuchiya (Okayama University/Japan) H. Khono (Daihen Corporation/Japan) Y. Kagawa (Okayam University/Japan).....	423
Inversion Using Multi-Tip Echoes of Elastic Waves K. Harumi (Tokyo University of Information Sciences/Japan) M. Uchida (Nihon University/Japan) T. Miyajima, Y. Ogura (Hitachi Construction Machinary Co. Ltd./Japan)	433
Surface Reconstruction of a Three-Dimensional Ultrasonic Flaw L.S. Koo (Idaho National Engineering Laboratory/USA).....	443
Generalized Ray Theory and Its Application to Long-Distance Ultrasonic Testing D.J. Chinn, H.A. Dieterman (Delft University of Technology/The Netherlands).....	453