

Contents

Part I: General Approaches and Strategies: Multi-Disciplinary Optimization

Multidisciplinary System Optimisation on the Design of Cost Effective Space Launch Vehicle	3
Cédric Dupont, Andrea Tromba, and Sophie Missonnier	
Multidisciplinary Design Optimization of Body Exterior Structures.	17
Michel H.J.W. Paas and Hessel C. van Dijk	
An Augmented Sequential Optimization and Reliability Assessment for Reliability-Based Design Optimization	31
Jafar Roshanian, Ali A. Bataleblu, Benyamin Ebrahimi, and Ali A. Amini	
Metamodel-Based Multidisciplinary Design Optimization of a General Aviation Aircraft	47
Jafar Roshanian, Ali A. Bataleblu, Mohammad H. Farghadani, and Benyamin Ebrahimi	
How to Deal with Mixed-Variable Optimization Problems: An Overview of Algorithms and Formulations	64
Julien Pelamatti, Loïc Brevault, Mathieu Balesdent, El-Ghazali Talbi, and Yannick Guerin	
Comprehensive PHEV Powertrain Co-design Performance Studies Using MDSDO	83
Saeed Azad, Mohammad Behdash, Arian Houshmand, and Michael Alexander-Ramos	
Benchmarking Approaches for the Multidisciplinary Analysis of Complex Systems Using a Taylor Series-Based Scalable Problem	98
Shamsheer S. Chauhan, John T. Hwang, and Joaquim R.R.A. Martins	

Convergence Strategy for Parallel Solving of Analytical Target Cascading with Augmented Lagrangian Coordination	117
Yongsu Jung, Namwoo Kang, and Ikjin Lee	
Efficient Global Optimization Strategy Considering Expensive Constraints	133
Bin Yuan, Li Liu, Teng Long, and Renhe Shi	

Part II: General Approaches and Strategies: Multi-Objective Optimization

Producing Smart Pareto Sets for Multi-objective Topology Optimisation Problems	145
David J. Munk, Gareth A. Vio, Grant P. Steven, and Timoleon Kipouros	
Multicriterial Optimization of Geometrical and Structural Properties of the Basic Module of a Single-Branch Truss-Z Structure	163
Machi Zawidzki and Łukasz Jankowski	
Pseudo Expected Improvement Matrix Criteria for Parallel Expensive Multi-objective Optimization	175
Dawei Zhan, Jiachang Qian, Jun Liu, and Yuansheng Cheng	
Optimal Near Sun Synchronous Orbital Design of a Nadir-Pointing Cubic Satellite with the Purpose of Thermal Load Control	191
Asad Saghari, Shima Rahmani, and Amir-reza Kosari	

Part III: General Approaches and Strategies: Design of Experiments and Surrogate Models (Meta-Models)

Simple Intuitive Multi-objective Parallelization of Efficient Global Optimization: SIMPLE-EGO	205
Carla Grobler, Schalk Kok, and Daniel N. Wilke	
Gaussian Process for Aerodynamic Pressures Prediction in Fast Fluid Structure Interaction Simulations	221
Ankit Chiplunkar, Elisa Bosco, and Joseph Morlier	
Efficient Metamodeling Strategy Using Multivariate Linear Interpolation for High Dimensional Problems	234
Kyeonghwan Kang, Ikjin Lee, and Donghyun Kim	
Surrogate Modeling in the Design Optimization of Structures with Discontinuous Responses with Respect to the Design Variables – A New Approach for Crashworthiness Design	242
C. Boursier Niutta, E.J. Wehrle, F. Duddeck, and G. Belingardi	

RBF-Based High Dimensional Model Representation Method Using Proportional Sampling Strategy 259
 Xin Li, Teng Long, G. Gary Wang, Kambiz Haji Hajikolaie, and Renhe Shi

A Surrogate-Based Optimization Using Polynomial Response Surface in Collaboration with Population-Based Evolutionary Algorithm 269
 Shima Rahmani, Masoud Ebrahimi, and Ayat Honaramooz

Using Gaussian Process to Enhance Support Vector Regression 281
 Yi Zhang, Wen Yao, Xiaoqian Chen, and Fred van Keulen

Part IV: General Approaches and Strategies: Uncertainty and Robust Design

Improved Sequential Optimization and Reliability Assessment for Reliability-Based Design Optimization 289
 Sang-Hyeon Choi and Ikjin Lee

Improved Adaptive-Loop Method for Non-probabilistic Reliability-Based Design Optimization 299
 Yutian Wang, Peng Hao, Chen Liu, Wu Fangzhou, and Bo Wang

Multi-objective Reliability-Based Design Optimization for Energy Absorption Components Considering Manufacturing Effects 310
 Huile Zhang, Guangyong Sun, Guangyao Li, and Qing Li

Robust Design Optimization of Vehicle and Adaptive Cruise Control Parameters Considering Fuel Efficiency 320
 Hansu Kim, Tae Hee Lee, Yuho Song, and Kunsoo Huh

Bootstrap Guided Information Criterion for Reliability Analysis Using Small Sample Size Information 326
 Eshan Amalnerkar, Tae Hee Lee, and Woochul Lim

Stochastic Sensitivity Analysis for Robust Topology Optimization 334
 Xuchun Ren and Xiaodong Zhang

An Improved MPP-Based Importance Sampling Method for Reliability Analysis 347
 Guijian Tang, Wen Yao, Xiaoqian Chen, and Yong Zhao

Characterization of Geometric Uncertainty in Gas Turbine Engine Components Using CMM Data 361
 Jennifer Forrester and Andy Keane

An Optimal Configuration of an Aircraft with High Lift Configuration Using Surrogate Models and Optimisation Under Uncertainties 375
 Joachim Rang and Wolfgang Heinze

Reliability-Based Topology Optimization for Continuum Structures with Non-probabilistic Uncertainty	390
Jing Zheng and Zhen Luo	
Big-Data Based Rule-Finding for Analysis of Crash Simulations	396
C. Diez, P. Kunze, D. Toewe, C. Wieser, L. Harzheim, and A. Schumacher	
Mathematical Models and Methods of Effective Estimation in Multi-objective Optimization Problems Under Uncertainties	411
Meniailov Ievgen, Khustochka Olexandr, Ugryumova Kateryna, Chernysh Sergey, Yepifanov Sergiy, and Ugryumov Mykhaylo	
A Shifted-Constraint RBDO Framework Using Monte Carlo Simulations	428
Shima Rahmani, Asad Saghari, and Masoud Ebrahimi	
Optimization of Manufacturing Tolerances on Sheet Metal Components in the Development Process	439
C. Hayer, S. Fiebig, T. Vietor, and J. Sellschopp	
<u>Part V: General Approaches and Strategies: Sensitivity Analysis and Parameter Identification</u>	
A Gradient-Based Topology Optimisation for Radar Cross Sections in Two-Dimensional Acoustics	455
Hiroshi Isakari, Toru Takahashi, and Toshiro Matsumoto	
A Topology Optimisation of Wave Absorbers in Two-Dimensional Electro-Magnetic Field with an Accelerated BEM by the \mathcal{H}-Matrix Method	469
Kenta Nakamoto, Hiroshi Isakari, Toru Takahashi, and Toshiro Matsumoto	
High-Fidelity Aero-Structure Gradient Computation Techniques. Application to the Onera M6 Wing	483
Timothée Achard, Christophe Blondeau, and Roger Ohayon	
Identification for Input Sound Pressure Level in Hammering Test Based on Adjoint Variable and Finite Element Methods	500
Eiki Matsuoka, Takahiko Kurahashi, Yuki Murakami, Shigehiro Toyama, Fujio Ikeda, Tetsuro Itama, and Yoshihiro Tawara	
Application of Digital Image Correlation to Material Parameter Identification	507
Nielen Stander, Katharina Witowski, Christian Ilg, Andre Haufe, Martin Helbig, and David Koch	

Part VI: General Approaches and Strategies: General Aspects of Single-Objective Optimization

A Novel Adaptive Region-Based Global Optimization Method for High Dimensional Problem 525
 Fan Ye and Hu Wang

Coupling of Computer-Aided Methods: Supporting Product Developer During Embodiment Synthesis. 536
 Albert Albers, Markus Spadinger, Manuel Serf, Stefan Reichert, Steffen Heldmaier, Micha Schulz, and Nikola Bursac

Optimization Design of Smart Reversible Diaphragms Using Shape Memory Polymer 549
 Qing-Sheng Yang, Ran Tao, and Pin Wen

Experimental and Numerical Analysis of Mechanical Properties of Tape Spring Hinges and Optimal Design 562
 Hong-ling Ye, Yang Zhang, Qing-sheng Yang, and Ramana V. Grandhi

Multidisciplinary Structural Optimization Using of NSGA-II and ϵ -Constraint Method in Lightweight Application. 573
 Vahid Ghaffari Mejlej, Paul Falkenberg, Eiko Türck, and Thomas Vietor

Fast Dynamic Analysis of Beam-Type Structures Based on Reduced-Order Model. 590
 Yuwei Li, Bo Wang, Peng Hao, Yan Zhou, and Yang Zhao

Parametric Modeling and Optimal Design of Space Tubular Extendable Booms via a One-Dimensional Unified Formulation 597
 Yi Hu, Yong Zhao, Zhouhui Tuo, and Jie Wang

Part VII: Optimization Algorithms: Local Mathematical Methods

Multi-Fidelity Optimization of Complex Physics Involved Engineering Systems. 613
 C. Corey Fischer and Ramana V. Grandhi

Efficient Optimal Surface Texture Design Using Linearization. 632
 Chendi Lin, Yong Hoon Lee, Jonathon K. Schuh, Randy H. Ewoldt, and James T. Allison

Quadratic Multipoint Exponential Approximation: Surrogate Model for Large-Scale Optimization 648
 Robert A. Canfield

Topology Optimization of General-Joint Planar Linkage Mechanisms with an Application to Finger Rehabilitation Device Design. 662
 Seok Won Kang, Jeong Han Yu, Sang Min Han, and Yoon Young Kim

**Part VIII: Optimization Algorithms: Global Methods
(e.g. Evolutionary Algorithms)**

A Cross-Entropy Optimization Algorithm for Continuous Function Based on Improved Sampling 675
 Zhengyang Ma, Wen Yao, Yong Zhao, and Yiyong Huang

Surrogate Based Global Optimization Using Adaptive Switching Infill Sampling Criterion 692
 Dohyun Park, In-Bum Chung, and Dong-Hoon Choi

Enhanced Firefly Algorithm with Implicit Movement 700
 Ronald Bartz, Sierk Fiebig, Thilo Franke, Paul Falkenberg, and Joachim Axmann

Application of Multilevel Optimization Algorithms 710
 László Kota and Károly Jármai

Part IX: Structural Optimization: Sizing

Structure Sizing Optimization Capabilities at AIRBUS 719
 Stéphane Grihon

Mixed-Integer Linear Programming Reformulation Approach for Global Discrete Sizing Optimization of Trussed Steel Portal Frames . . . 738
 Roxane Van Mellaert, Kristo Mela, Teemu Tiainen, Markku Heinisuo, Geert Lombaert, and Mattias Schevenels

Optimal Design of Double-Pipe Heat Exchangers 755
 Máté Petrik, Gábor Szepesi, and Károly Jármai

**Part X: Structural Optimization:
Fiber and Composite Optimization**

Optimization of Oriented and Parametric Cellular Structures by the Homogenization Method 767
 Perle Geoffroy-Donders, Grégoire Allaire, Julien Cortial, and Olivier Pantz

Generating the Best Stacking Sequence Table for the Design of Blended Composite Structures 779
 F. Farzan Nasab, H.J.M. Geijselaers, I. Baran, and A. de Boer

A Lean Method for Local Patch Reinforcement Using Principal Stress Lines 789
 Philipp Gebhardt, Eiko Türck, and Thomas Vietor

Frequency Response Characteristics of 2D Wings in Uncertain Environments: A Random Matrix Theory Approach 799
 Aditya Vishwanathan, David Munk, and Gareth Vio

Gradient Based Structural Optimization of a Stringer Stiffened Composite Wing Box with Variable Stringer Orientation 814
 Sascha Dähne and Christian Hühne

Optimization Approach for Free-Orientation of a Laminated Shell Structure with Orthotropic Material 827
 Yoshiaki Muramatsu and Masatoshi Shimoda

Structural Optimization of Stiffened Composite Panels for Highly Flexible Aircraft Wings 838
 Tobias Bach and Christian Hühne

SIMP Based Topology Optimization for Injection Molding of SFRPs . . . 850
 Felix Ospald and Roland Herzog

Part XI: Structural Optimization: Shape Optimization

Optimization of Stepped Plates in the Elastic Plastic Range 865
 Jaan Lellep and Julia Polikarpus

Geometric Design of Tumbling Mill Lifter Bars Utilizing the Discrete Element Method 878
 Daniel N. Wilke, Nicolin Govender, Raj K. Rajamani, and P. Pizette

Shape Optimization of Shell Structure for Controlling Transient Response 889
 Mamoru Wakasa and Masatoshi Shimoda

Shape Optimization for Microstructure Design of Porous Materials Described by the Biot model in the Homogenization Framework 904
 Eduard Rohan, Daniel Hübner, Vladimír Lukeš, and Michael Stingl

Optimum Morphing Shape Design for Morphing Wing with Corrugated Structure Using RBF Network 916
 Gen Nakamura, Kengo Uehara, Nozomu Kogiso, and Tomohiro Yokozeki

Part XII: Structural Optimization: Topology Optimization with Density Methods - Principal Approach

Comparison of Different Formulations of a Front Hood Free Sizing Optimization Problem Using the ESL-Method 933
 Artem Karev, Lothar Harzheim, Rainer Immel, and Matthias Erzgräber

A Study on the Design of Large Displacement Compliant Mechanisms with a Strength Criteria Using Topology Optimization 952
 Daniel M. De Leon, Juliano F. Gonçalves, and Carlos E. de Souza

Efficient Density Based Topology Optimization Using Dual-Layer Element and Variable Grouping Method for Large 3D Applications . . .	967
Jaeun Yoo and Ikjin Lee	
Topology Optimization and Reinforcement Derivation Method (RDM®) of a Hybrid Material Sump	979
Marine Favre Decloux, Alex Desmond, Lucy Fusco, Martin Gambling, and Markus Hose	
Topology Optimization with Stress Constraints Using Isotropic Damage with Strain Softening	991
Yakov Zelickman and Oded Amir	
Simultaneous Topology Optimization of Material Density and Anisotropy	1009
Narindra Ranaivomiarana, François-Xavier Irisarri, Dimitri Bettebghor, and Boris Desmorat	
A Simple Approach to Deal with Zero Densities in Topology Optimisation	1019
Kazem Ghabraie	
Using Exact Particular Solutions and Modal Reduction in Topology Optimization of Transient Thermo-Mechanical Problems	1027
Max van der Kolk, Evert C. Hooijkamp, Matthijs Langelaar, and Fred van Keulen	
Optimal Tendon Layouts for Concrete Slabs in Buildings Derived Through Density-Based Topology Optimization Algorithms	1042
Mark Sarkisian, Eric Long, Alessandro Beghini, Rupa Garai, David Shook, Ricardo Henoch, and Abel Diaz	
Contributions to Handle Maximum Size Constraints in Density-Based Topology Optimization	1054
Eduardo Fernández, Maxime Collet, Simon Bauduin, Etienne Lemaire, and Pierre Duysinx	
Multimaterial Topology Optimization of Contact Problems Using Allen-Cahn Approach	1069
Andrzej Myśliński	
Conceptual Design of Aircraft Structure Based on Topology Optimization Method	1083
Guanghai Shi, Yupeng Zhang, Dongliang Quan, Dongtao Wu, and Chengqi Guan	
Singular, Large-Scale Solutions in Local Stress-Constrained Topology Optimization	1094
Dirk Munro and Albert Groenwold	

Robust Multi-material Topology Optimization for Lattice Structure Under Material Uncertainties 1110
 Kohei Shintani, Yu-Chin Chan, and Wei Chen

Part XIII: Structural Optimization: Topology Optimization with Density Methods – Special Extensions

An Element Deactivation and Reactivation Scheme for the Topology Optimization Based on the Density Method 1127
 Robert Dienemann, Axel Schumacher, and Sierk Fiebig

Topology and Cost Optimization Applied to Develop New Designs for a Monorail Structure 1143
 Christopher Carrick and Il Yong Kim

Knowledge Discovery in Dataset Generated by Topology Optimization . . . 1156
 Shintaro Yamasaki, Kentaro Yaji, and Kikuo Fujita

Automatic Definition of Density-Driven Topology Optimization with Graph-Based Design Languages 1168
 Manuel Ramsaier, Ralf Stetter, Markus Till, Stephan Rudolph, and Axel Schumacher

A PDE-Based Approach to Constrain the Minimum Overhang Angle in Topology Optimization for Additive Manufacturing 1185
 Emiel van de Ven, Can Ayas, Matthijs Langelaar, Robert Maas, and Fred van Keulen

Optimal External Support Structure Design in Additive Manufacturing 1200
 Yu-Hsin Kuo and Chih-Chun Cheng

Topology Optimization of Large Scale Turbine Engine Bracket Assembly with Additive Manufacturing Considerations 1211
 Bradley Taylor, Jamal Zeinalov, and Il Yong Kim

Solving 2D/3D Heat Conduction Problems by Combining Topology Optimization and Anisotropic Mesh Adaptation 1224
 Kristian Ejlebjerg Jensen

Part XIV: Structural Optimization: Topology Optimization with Level Set Methods

Integrated Topology Optimization of Multi-component System Considering Interface Behavior of Interconnection Based on Conforming Mesh and Interface Elements 1241
 Pai Liu and Zhan Kang

Stress Topology Optimisation for Architected Material Using the Level Set Method	1254
Renato Picelli, Raghavendra Sivapuram, Scott Townsend, and H. Alicia Kim	

Part XV: Structural Optimization: Topology Optimization with Other Methods

Multi-objective Structural Optimization and Design of Microsatellite Supporting Legs	1273
Hao Xu, Yong Zhao, Wen Yao, Ning Wang, and Bingxiao Du	

Dynamic Behavior of Hanging Truss Having Shape Memory Alloys (From the Optimization Viewpoint of Vibration Isolation and Attenuation)	1283
Xuan Zhang, Kazuyuki Hanahara, and Yukio Tada	

A Novel Heuristic Generator of Structural Topologies Based on Sorted Compliances	1296
Monika Mazur, Katarzyna Tajs-Zielińska, and Bogdan Bochenek	

Modifications of Bidirectional Evolutionary Structural Optimization for Structure Compliance	1306
Vu Truong Vu	

Constrained Versions of the Free Material Design Methods and Their Applications in 3D Printing	1317
Tomasz Lewiński, Sławomir Czarnecki, Radosław Czubacki, Tomasz Łukasiak, and Paweł Wawruch	

Macroscopically Isotropic and Cubic-Isotropic Two-Material Periodic Structures Constructed by the Inverse-Homogenization Method	1333
Tomasz Łukasiak	

Pylon and Engine Mounts Performance Driven Structural Topology Optimization	1349
Simone Coniglio, Christian Gogu, Rémi Amargier, and Joseph Morlier	

Human-in-the-Loop Layout and Geometry Optimization of Structures and Components	1364
Linwei He, Matthew Gilbert, Thomas Johnson, and Chris Smith	

Young's Modulus Control in Material and Topology Optimization	1374
Grzegorz Dzierżanowski and Tomasz Lewiński	

Regularization Scheme for Controlling Length Scale in Topology Optimization Based on Bacterial Chemotaxis	1386
J.X. Leon-Medina, J.F. Giraldo-Avila, and M.A. Guzmán	

Structural Optimization Under Buckling Constraints Using Frame Elements with Anisotropic Cross Sections 1394
 Florian Mitjana, Sonia Caferi, Florian Bugarin, Christian Gogu, and Fabien Castanie

On the Numerical Approximation of Michell Trusses and the Improved Ground Structure Method 1411
 Tomasz Sokół

Cost and Weight Optimization of Hybrid Parts Using a Multi-material Topology Optimization Approach 1418
 Paul Falkenberg, Eiko Türck, and Thomas Vietor

Part XVI: Optimization with Emphasis on Particular Physics Model: Considering Non-Linear Effects (e.g. Material, Geometric, Contact)

Topology Optimization of Orthotropic Elastic Design Domains with Mortar Contact Conditions 1427
 Niclas Strömberg

Topology Optimization of Structures with Elasto-Plastic Strain Hardening Material Modeling 1439
 Mengxiao Li and Hexin Zhang

Investigation of Contact Settings on the Result of Topology Optimization to Avoid Contact Stiffness Supports 1455
 Daniel Billenstein, Christian Glenk, Pascal Diwisch, and Frank Rieg

Optimal Design of Skeletal Structures Exhibiting Nonlinear Response 1468
 Hazem Madah and Oded Amir

Evolutionary Topology Optimization for Designing Cellular Fluid Actuators 1484
 Daniel Candeloro Cunha and Renato Pavanello

Part XVII: Optimization with Emphasis on Particular Physics Model: Considering Dynamic and Acoustic Load-Cases

Topological Design of Vibro-Acoustic Structures Using a Generalized Incremental Frequency Method 1499
 Niels Olhoff and Jianbin Du

An Approach to Use the Structural Intensity for Acoustical Topology Optimization 1516
 Sebastian Rothe and Sabine C. Langer

Three-Dimensional Topology Optimization of a Flexible Multibody System via Moving Morphable Components 1529
 Jialiang Sun, Qiang Tian, and Haiyan Hu

Part XVIII: Optimization with Emphasis on Particular Physics Model: Considering Crash Load-Cases

Metamodel-Based Global Optimization of Vehicle Structures for Crashworthiness Supported by Clustering Methods 1545
 Kai Liu, Duane Detwiler, and Andres Tovar

Automatic Generation, Validation and Correlation of the Submodels for the Use in the Optimization of Crashworthy Structures 1558
 Carlos J. Falconi D., Alexander F. Walser, Harman Singh, and Axel Schumacher

Multidisciplinary Optimisation of an Automotive Body-in-White Structure Using Crushable Frame Springs and Sub Space Metamodels in Trust-Regions 1572
 Charles Mortished, Jonathan Ollar, Peter Benzie, Royston Jones, Johann Sienz, and Vassili Toropov

Topology Optimization of Thin-Walled Structures Under Static/Crash Loading Case in the Hybrid Cellular Automaton Framework 1585
 Duo Zeng and Fabian Duddeck

A Topology Optimization Scheme for Crash Loaded Structures Using Topological Derivatives 1601
 Katrin Weider and Axel Schumacher

Finding Optimized Layouts for Ribs on Surfaces Using the Graph and Heuristic Based Topology Optimization 1615
 Dominik Schneider and Axel Schumacher

Part XIX: Optimization with Emphasis on Particular Physics Model: Considering Fatigue/Durability/Damage

Blend Repair Shape Optimization for Damaged Compressor Blisks . . . 1631
 Ricarda Berger, Jan Häfele, Benedikt Hofmeister, and Raimund Rolfes

Optimization of Fail-Safe Lattice Structures 1643
 Benedikt Kriegesmann, Julian Lüdeker, and Micah Kranz

Probability-Based Damage Detection of Structures Using Surrogate Model and Enhanced Ideal Gas Molecular Movement Algorithm 1657
 Mohammad Reza Ghasemi, Ramin Ghiasi, and Hesam Varaeae

Optimization of Finite Element Mesh Division Considering Stress Singularity for Bonded Structures 1675
 Kengo Yamagiwa and Takahiko Kurahashi

Part XX: Optimization with Emphasis on Particular Physics Model: Considering Piezoelectricity, Magnetic and Electrical Fields

Topology Optimization of Power Semiconductor Devices 1685
 Katsuya Nomura, Tsuguo Kondoh, Tsuyoshi Ishikawa, Shintaro Yamasaki, Kentaro Yaji, and Kikuo Fujita

Conductor Layout Optimization for Reducing the Magnetic Coupling Noise of a Filter Circuit Board 1693
 Hiroki Bo, Shintaro Yamasaki, Kentaro Yaji, Katsuya Nomura, Atsuhiko Takahashi, and Kikuo Fujita

Integrated Design of Permanent Magnet Synchronous Motor by Incorporating Magnet Layout and Yoke Topology Optimizations 1705
 Shun Maruyama, Shintaro Yamasaki, Kentaro Yaji, and Kikuo Fujita

Part XXI: Optimization with Emphasis on Particular Physics Model: Considering Other Specialty Disciplines

Shape and Structural Design Optimization of Graphene Sheets in Natural Vibration Problem 1719
 Jin-Xing Shi, Keiichiro Ohmura, and Masatoshi Shimoda

Two-Scale Concurrent Topology Optimization with Multiple Micro Materials Based on Principal Stress Direction 1726
 Liang Xu and Gengdong Cheng

Topology Optimization of Viscoelastic Materials for Maximizing Damping and Natural Frequency of Macrostructures 1738
 Qiming Liu and Xiaodong Huang

Design of Adsorbed Natural Gas Tanks with Metal Inclusions by Topology Optimisation 1757
 R.C.R. Amigo, R.W. Hewson, and E.C.N. Silva

Part XXII: Optimization with Emphasis on Particular Physics Model: Considering Manufacturing Aspects

Topology Optimization for Unifying Deposit Thickness in Electroplating Process 1767
 Naoko Ishizuka, Takayuki Yamada, Kazuhiro Izui, and Shinji Nishiwaki

Multiscale, Thermomechanical Topology Optimization of Cellular Structures for Porous Injection Molds 1783
 Tong Wu, Kim Brand, Doyle Hewitt, and Andres Tovar

Multidisciplinary Shape Optimization of Ductile Iron Castings by Considering Local Microstructure and Material Behaviour 1798
 Jakob Olofsson, Riccardo Cenni, Matteo Cova, Giacomo Bertuzzi, Kent Salomonsson, and Joel Johansson

Topology Optimization with Integrated Casting Simulation and Parallel Manufacturing Process Improvement 1815
 Thilo Franke, Sierk Fiebig, Karsten Paul, Thomas Vietor, and Jürgen Sellschopp

Part XXIII: Optimization with Efocusing on Particular Industrial Applications: Automotive

Parameterization Setup for Metamodel Based Optimizations of Tailor Rolled Blanks 1833
 Niklas Klinke and Axel Schumacher

A Study of Topology Optimization for Joint Locations of Automotive Full Vehicle 1851
 Takano Saito, Yoshikiyo Tamai, and Jiro Hiramoto

Part XXIV: Optimization with Efocusing on Particular Industrial Applications: Aircraft

On Fast Design of Innovative Hierarchical Stiffened Shells Against Imperfections 1865
 Kuo Tian, Bo Wang, Tianyu Zhu, Sijun Xiong, Ke Zhang, and Peng Hao

Mixed Variable Structural Optimization: Toward an Efficient Hybrid Algorithm 1880
 Pierre-Jean Barjhoux, Youssef Diouane, Stéphane Grihon, Dimitri Bettebghor, and Joseph Morlier

Part XXV: Optimization with Efocusing on Particular Industrial Applications: Civil Engineering

Optimal Estimation of Tidal Flow Based on Kalman Filter FEM Using Time History of Water Elevation 1899
 Takahiko Kurahashi, Taichi Yoshiara, Yasuhide Kobayashi, and Noboru Yamada

Topology Optimization of Elastic Wave Barriers Using a Two-and-A-Half Dimensional Finite Element Methodology 1906
 Cédric Van hoorickx, Mattias Schevenels, and Geert Lombaert

Buckling Length in Mixed-Integer Linear Frame Optimization 1923
 Teemu Tiainen, Kristo Mela, and Markku Heinisuo

Optimization of Extradosed Concrete Bridges 1937
 Alberto M.B. Martins, Luís M.C. Simões, and João H.J.O. Negrão

Optimization of Concrete Cable-Stayed Bridges with Discrete Design Variables 1955
 L.M.C. Simões, A.M.B. Martins, and J.H.J.O. Negrão

A Discrete Particle Swarm Algorithm for Sizing Optimization of Steel Truss Structures 1974
 Waldir N. Felipe and Luiza F. Carneiro

Design of Cellular Materials and Mesostructures with Improved Structural and Thermal Performances 1983
 Gieljan Vantuyghem, Marijke Steeman, Wouter De Corte, and Veerle Boel

Modified Ideal Gas Molecular Movement Algorithm Based on Quantum Behavior 1997
 Mohammad Reza Ghasemi and Hesam Varae

Part XXVI: Optimization with Efocusing on Particular Industrial Applications: Energy Systems

Development of a Multi-Objective Genetic Algorithm for the Design of Offshore Renewable Energy Systems 2013
 Ajit C. Pillai, Philipp R. Thies, and Lars Johanning

Life Cycle Assessment of Welded Structures Using Cost Optimization 2027
 Károly Jármai

A New Optimisation Framework for Investigating Wind Turbine Blade Designs 2044
 T. Macquart, V. Maes, D. Langston, A. Pirrera, and P.M. Weaver

Part XXVII: Optimization with Efocusing on Particular Industrial Applications: Others

Optimum Design on Neck Embossing Decoration of Aluminum Beverage Bottles 2063
 Jing Han, Koetsu Yamazaki, and Akiyoshi Matsuzaki

**Preliminary Study on Optimization of a Bulge Tool
for Nuclear Fuel Manufacturing** 2076
Jae-Jun Lee, Young-Duk Sim, Nam-Gyu Park, Se-Ick Son,
and Jong-Sung Yoo

**Design of Bone Plates for Mandibular Reconstruction
Using Topology and Shape Optimization** 2086
Michael Seebach, Felix Theurer, Peter Foehr, Constantin von Deimling,
Rainer Burgkart, and Michael Friedrich Zaeh

**Comparative Study Between Different Strut’s Cross Section Shape
on Minimizing Low Wall Shear Stress Along Stent Vicinity
via Surrogate-Based Optimization** 2097
Narendra Kurnia Putra, Pramudita Satria Palar, Hitomi Anzai,
Koji Shimoyama, and Makoto Ohta

Author Index 2111

<http://www.springer.com/978-3-319-67987-7>

Advances in Structural and Multidisciplinary
Optimization

Proceedings of the 12th World Congress of Structural
and Multidisciplinary Optimization (WCSMO12)

Schumacher, A.; Vietor, Th.; Fiebig, S.; Bletzinger, K.-U.;
Maute, K. (Eds.)

2018, XXII, 2115 p. 1225 illus. In 2 volumes, not
available separately., Hardcover

ISBN: 978-3-319-67987-7