

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 Behtash, 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	
 <u>Part IV: General Approaches and Strategies: Uncertainty and Robust Design</u>	
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
Meniaïlov 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 Türec, 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 Türec, 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 Billenstien, 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 Accoustic 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 Varae

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**
Takanobu 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 Vantighem, 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 Jármay	
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

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