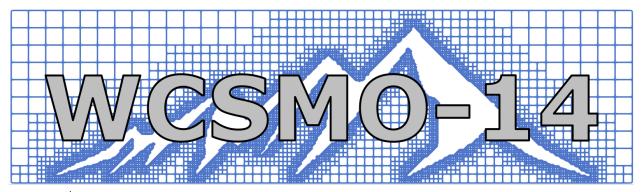
WCSMO-14

Program

Version: June 9, 2021



14th World Congress of Structural and Multidisciplinary Optimization June 13-18, 2021

The support from the following sponsors is gratefully acknowledged:

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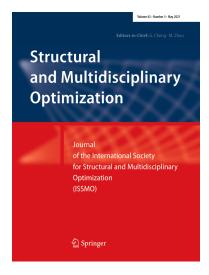


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Welcome to WCSMO-14

On behalf of the International Society for Structural and Multidisciplinary Optimization (ISSMO), we welcome you to the 14th World Congress of Structural and Multidisciplinary Optimization (WCSMO-14) held online from the June 13 to 18, 2021.

Originally, WCSMO-14 was scheduled to take place at the beautiful campus of the University of Colorado in Boulder, USA. However, due to the COVID-19 pandemic and its impact on everybody's life, traveling to Boulder became impossible. Thus, the local organizing committee in consultation with the executive committee of ISSMO decided to convert WCSMO-14 into an all virtual conference.

While there are undoubtedly many downsides to a virtual conference, this conference format lowers the cost of attendance and allows participation by researchers who would not be able to travel to the US. Another important benefit of a virtual conference is the drastically reduced carbon footprint. Thus, while a lot of us will miss meeting colleagues and friends in person, there are also a few positive aspects of WCSMO-14 being online.

WCSMO-14 will feature 466 technical talks, two invited plenary talks, four State-of-the-Art talks, and ten socializing events. Furthermore, the General Assembly of ISSMO will be held during the conference. To accommodate the different time zones of participants around the globe, the sessions are grouped into two blocks: a *morning block* from 7:00 - 11:00 AM US Mountain Daylight Time (MDT) and an *afternoon block* from 6:00 - 10:00 PM MDT. A link to an online tool for converting these times to your local time is provided in the program.

The online format of WCSMO-14 allows for a unique approach to attending the technical talks. Starting June 1, 2021, registered attendees will be able to watch the recordings of all presentations. The recordings will be available past the conference, through August 1st, 2021. At the technical session scheduled during the week of the conference, each presenter will briefly introduce her/his talk in no-more than two minutes. The introduction of all presentations of a session is followed by an unmoderated poster-style discussion in breakout rooms. Participants will be able to join the poster-style discussions of presentations of their interest, conveniently switching between sessions and presentations. Participants are strongly encouraged to watch the recordings of the presentations and post questions before the live session featuring the presentations of interest.

To enhance the interaction among attendees and to promote the lively exchange of ideas, several socializing events are scheduled. Outside these events, participants are encouraged to meet informally in the virtual networking lounge. It is recommended that participants familiarize themselves with the virtual conference platform and other online features. Links to a set of training videos are provided in this program.

We hope that you will enjoy WCSMO-14 and, please, do not hesitate to contact us if you have any questions or comments. Your feedback is appreciated very much.

The Local Organizing Committee of WCSMO-14

Alireza Doostan, John Evans, James Guest, Kurt Maute, Julian Norato

About ISSMO and WCSMO

The International Society for Structural and Multidisciplinary Optimization (ISSMO) was founded in October 1991. Today ISSMO has almost one thousand members from more than 50 countries. The objectives of ISSMO are:

- to stimulate and promote research into all aspects of the optimal design of structures as well as multidisciplinary design optimization where the involved disciplines deal with the analysis of solids, fluids or other field problems
- to encourage practical applications of optimization methods and the corresponding software development in all branches of technology
- to foster the interchange of ideas amongst various fields contributing to structural and multidisciplinary optimization
- to support the role of optimization in multidisciplinary design
- to provide a framework for the organization of meetings and other means for the dissemination of knowledge on structural and multidisciplinary optimization and
- to promote teaching of structural and multidisciplinary optimisation in tertiary institutions.

One of the aims of ISSMO is to bring together researchers and practitioners in the field of structural and multidisciplinary optimization (SMO), by means of international meetings having a high scientific standard. Host selection criteria for these meetings include: up-to-date conference facilities, affordable costs to all members of the society (including registration, hotel, travel expenses, considering also free lunches, banquet, excursions etc.), proven congress organizing experience and strength of the local organizing group, geographical diversity reflecting the distribution of SMO researchers over the world.

This is meant to imply a reasonably uniform distribution of congresses over three zones, namely Asia-Australia, Europe-Africa and North & South Americas. Along these lines, ISSMO has held biennial World Congresses of Structural and Multidisciplinary Optimization since 1995:

- Goslar, Germany in 1995 (WCSMO-1)
- Zakopane, Poland in 1997 (WCSMO-2)
- Buffalo, United States in 1999 (WCSMO-3)
- Dalian, China in 2001 (WCSMO-4)
- Lido di Jesolo, Italy in 2003 (WCSMO-5)
- Rio de Janeiro, Brazil in 2005 (WCSMO-6)
- Seoul, South Korea in 2007 (WCSMO-7)
- Lisbon, Portugal in 2009 (WCSMO-8)
- Shizouka, Japan in 2011 (WCSMO-9)
- Orlando, United States in 2013 (WCSMO-10)

- Sydney, Australia in 2015 (WCSMO-11)
- Braunschweig, Germany in 2017 (WCSMO-12)
- Bejing, China in 2019 (WCSMO-13)

ISSMO Executive Committee:

Wei Chen, President Northwestern University

Alicia Kim, Secretary General University of California, San Diego

Ming Zhou, Vice President

Qing Li, Vice President

University of Sydney

Erik Lund, Treasurer

Alborg University

Pierre Duysinx

University of Liège

Xu Guo
 Dalian University of Technology
 Ole Sigmund
 Technical University of Denmark
 Gengdong Cheng, Past President
 Dalian University of Technology

James K. Guest, Past Secretary General Johns Hopkins University

Organization of WCSMO-14

Local organizing Committee:

John Evans University of Colorado Boulder Alireza Doostan University of Colorado Boulder

James K. Guest Johns Hopkins University

Kurt Maute (conference chair) University of Colorado Boulder

Julian Norato University of Connecticut

International Paper Committee (IPC):

Alireza Doostan University of Colorado Boulder

Alicia Kim (IPC chair) University of California, San Diego

Samy Missoum University of Arizona

Yoo Jeong Noh Pusan National University

Matthias Wallin Lund University

Peng Wei South China University of Technology

Virtual Conference Platform

The virtual conference platform has been built and operated by the Denver-based company, Image Audiovisuals Inc. All participants will receive an email prior to June 1, 2021, with the web address of the login page and instructions for logging in.

The virtual conference platform features several functions that allow the participants to assemble an individual conference schedule, participate in plenary and technical sessions and socializing events. The technical sessions and the *Coffee Break* room will be using *Zoom*. The *Meet and Greet* networking and socializing space will be using *Wonder.me*. All participants are strongly encouraged to familiarize themselves with these functions prior to the start of the live part of the conference on June 13, 2021.

All attendees need a Zoom account. Free Zoom accounts can be created at https://zoom.us/freesignup/. If possible, attendees should use the same email address they used for registering for the conference when creating their Zoom account. If attendees already have a Zoom account under a different email address, this will work too.

Please, visit the following web-site for training video for participants, presenters, and session chairs:

http://www.wcsmo14.org/instruction-and-training-videos/

The videos will be available May 28. In addition, questions to frequently asked questions can be found at:

https://www.wcsmo14.org/faqs/

Code of Conduct

All attendees of WCSMO-14 have agreed by registering for the conference to the following code of conduct:

- The recording and/or transmission of sessions in any format is strictly prohibited. You agree to not reproduce or repurpose presentation materials in any way without the express consent from the presenter. Recording, copying, or taking screen shots of Q&A or any chat room activity that takes place in the virtual conference is prohibited as violation of copyright.
- All attendees are expected to show respect and courtesy to other attendees. There will be zero tolerance for any form of discrimination or harassment. All communication should be appropriate for a professional audience including people of all backgrounds. All participants, including, but not limited to, attendees, speakers, volunteers, exhibitors, staff members, and service providers are expected to abide by this policy. WCSMO-14 reserves the right to take any action deemed necessary and appropriate, including immediate removal from the WCSMO-14 virtual platform without warning or refund, in response to any incident of unacceptable behavior.

Acknowledgments

WCSMO-14 would not have been possible without the excellent support of a large number of people who the local organizing committee would like to thank.

University of Colorado Conference Services:

Jessica Follett, Amy Martinez

Image Audiovisuals Inc:

Garrett Bicknell, Briana Norton, Rob Wright

WCSMO-14 Website Development:

Carlos Hernan Villanueva

Student Support Team:

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Plenary and State-of-the-Art Talks

Plenary Talks

Plenary - 1

Monday, June 14, 20201, 7:00 AM - 7:50 AM MDT, Auditorium

Structural Optimization. Questions from Boeing

Vladimir Balabanov, Boeing

Abstract

In this presentation Vladimir Balabanov will share his experiences and views on Structural Optimization that he encounters at Boeing. Structural Optimization has grown a lot in the past couple of decades. So did other disciplines and fields. How is Structural Optimization looked at in Boeing now? What is its relationship with the other disciplines and fields? Vladimir will share misconceptions, frustrations, and successes, illustrated with examples. As an invitation to discussion that will follow the presentation, Vladimir will state the questions and possible directions where in his opinion structural optimization can continue growing to get more recognition and success at Boeing.

Plenary - 2

Tuesday, June 15, 20201, 6:00 PM - 6:50 PM MDT, Auditorium

Autonomous Optimization and Control of Energy Systems

Andrey Bernstein, National Renewable Energy Laboratory

Abstract

Power and energy systems undergoing significant changes. Electric power systems are integrating much more distributed and renewable energy resources such as rooftop solar photovoltaics and small battery systems. Transportation sectors such as personal vehicles are becoming electrified. The building sector experiences integration of smart appliances and thermostats in homes and advanced controls for commercial buildings. This talk focuses on the question of how to coordinate and optimize millions of devices in these modern energy systems in real time. Specifically, we present an algorithmic framework for real-time optimization of general networked systems and develop online distributed algorithms that steer the system towards the optimal system trajectory. The problem is modeled as a dynamic optimization problem with time-varying performance objectives and engineering constraints. Both model-based (firstorder, gradient-based) and model-free (zero-order) algorithms are developed. For zero-order algorithms, the gradient-descent step that involves the gradient of the objective function (and hence requires networked system model) is replaced by its zero-order approximation with two function evaluations. The evaluations are performed using the measurements of the system output, hence giving rise to a feedback interconnection, with the optimization algorithm serving as a feedback controller. We provide insights on the stability and tracking properties of this interconnection. Finally, we apply this methodology to a dynamic three-phase optimal power flow problem in a distribution system, for real-time reference power tracking and voltage regulation.

State-of-the-Art Talks

Continuing the tradition of previous WCSMO conferences, current and emerging research in structural and multidisciplinary design optimization will be presented in the following State-of-the-Art (SOTA) talks:

SOTA - Talks 1

Thursday, June 17, 6:00 PM - 6:50 PM, Auditorium

Topology optimization: methodologies and application

Josephine Carstensen, Massachusetts Institute of Technology

From Surrogate Modeling to Physics-informed Neural Networks – What Has Machine Learning Done for Engineering Analysis and Design?

Felipe Viana, University of Central Florida

SOTA - Talks 2

Friday, June 18, 7:00 AM - 7:50 AM, Auditorium

Digital transformation and optimization

Yoo Jeong Noh, Pusan National University

System analysis and design in uncertainty

Mathieu Balesdent, ONERA - The French Aerospace Lab

Socializing Events

To promote and enhance the interaction of attendees outside the technical sessions, WCSMO-14 will feature several socializing events. Some of these are mainly for entertainment, some focus on networking and career development, and others provide a forum for discussions around technical topics.

Please, note that for some of these events we ask attendees to sign-up in advance. This will ease the planning of the specific event and event organizers can reach out to the participants in advance. Whether signing-up is required is indicated with each event.

ISSMO Women Networking

The ISSMO Women Networking Event will be held twice during WCSMO-14. The tentative content includes a mentoring session featuring several female panelists and a networking session. This event aims to create a venue for junior and senior women researchers from varying backgrounds to share their career paths, career development options, work-life balance, and become mentors or mentees. The event also provides opportunities for researchers to discuss research interests and establish collaborations. All female researchers at all career stages are invited to attend.

ISSMO Women Networking - I (Socializing 1)

Organizer: X. Shelly Zhang, University of Illinois Urbana-Champaign,

zhangxs@illinois.edu

Time: Sunday, June 13, 7:00 PM – 7:50 PM MDT, Networking Lounge: Coffee

Break Room

Panelists: Wei Chen, H. Alicia Kim, Josephine V. Carstensen

Note: Sign-up is required; please, visit: Sign-up Page

ISSMO Women Networking - II (Socializing 8)

Organizer: X. Shelly Zhang, University of Illinois Urbana-Champaign,

zhangxs@illinois.edu

Time: Thursday, June 17, 10:00 AM – 11:00 AM MDT, Networking Lounge:

Coffee Break Room

Panelists: Rekha Rao, Lucia Mirabella, Hortense Gerardo

Note: Sign-up is required; please, visit: Sign-up Page

Young Investigator Workshop

Young professionals (i.e., professionals less than 40 years of age) are invited to participate in a Young Investigator Workshop. During this workshop, young professionals will have an

opportunity to ask questions of successful mid- and late-career professionals and researchers in an intimate small group setting. Workshop topics of interest include: Planning for a Career in Research in Academia or Industry, Surviving the Job Search, Getting Started in a New Position, Preparing Your First Grant Proposal, Maintaining a Work-Life Balance. Interested individuals are encouraged to participate in either the evening workshop on June 15 or the morning workshop on June 16.

Young Investigator Workshop - I (Socializing 5)

Organizer: John Evans, University of Colorado Boulder,

john.a.evans@colorado.edu

Time: Tuesday, June 15, 9:00 PM - 10:00 PM MDT, Networking Lounge:

Coffee Break Room

Panelists: Heng Chi, Junji Kato, Qing Li, Gil-Ho Yoon, Weihong Zhang

Note: Sign-up is required; please, visit: Sign-up Page

Young Investigator Workshop - II (Socializing 6)

Organizer: John Evans, University of Colorado Boulder,

john.a.evans@colorado.edu

Time: Wednesday, June 16, 10:00 AM – 11:00 AM MDT, Networking Lounge:

Coffee Break Room

Panelists: Pierre Duysinx, Graeme Kennedy, Claus Pedersen, Emilio Carlos Nelli

Silva, Mathias Wallin

Note: Sign-up is required; please, visit: Sign-up Page

The Altair Conference Talk Show

One of the major disadvantages of WCSMO-14 being virtual is the lack for social gatherings after the technical sessions. The goal of this one-hour live event is to better engage the attendees and to add a personal touch to WCSMO-14 that is typically missing from virtual conferences. To acknowledge the generous contribution from WCSMO-14's Platinum sponsor, Altair, this event is named the *The Altair Conference Talk Show*. It will feature a colloquial conversation about mainly non-technical topics; just like colleagues meeting after the technical sessions at an in-person conference for dinner and chat. The idea is to do something similar at WCSMO-14 in a talk show style event where three guests and one host will engage in some hopefully interesting and entertaining discussions, which will be live broadcasted via zoom. The audience will be able to ask questions via chat.

The Altair Conference Talk Show - I (Socializing 2)

Organizer: Kurt Maute, University of Colorado Boulder, maute@colorado.edu

Time: Monday, June 14, 10:00 AM – 11:00 AM MDT, Networking Lounge:

Coffee Break Room (Breakout 1)

Guests: Wei Chen, Glaucio Paulino, Ole Sigmund

Note: No sign-up is required

The Altair Conference Talk Show - II (Socializing 3)

Organizer: Kurt Maute, University of Colorado Boulder, maute@colorado.edu

Time: Monday, June 14, 9:00 PM - 10:00 PM MDT, Networking Lounge:

Coffee Break Room

Guests: Gengdong Cheng, Yoon Young Kim, Daniel Tortorelli

Note: No sign-up is required

Design Optimization in Practice (Socializing 10)

This event will feature a diverse industry panel with participants from different areas. The panelists will discuss where and how design optimization is currently used, what challenges it faces, and what issues need more attention from the research community. Additional topics may include career pathways in the panelists' companies related to design optimization. Panelists will provide advice for young researchers currently working on design optimization how to prepare themselves for a successful career in industry. The audience will be able to ask questions via chat.

Organizer: Julian Norato, University of Connecticut, julian.norato@uconn.edu

Time: Friday, June 18, 10:00 AM – 11:00 AM, Networking Lounge: Coffee

Break Room

Panelists Vladimir Balabanov, Julien Cortial, Sierk Fiebig, Matthew Lynch,

Yuqing Zhou

Note: No sign-up is required

Discussion Roundtables

High Performance Computing (HPC) in large-scale structural optimization (Socializing 2)

The roundtable will focus on the use of High Performance Computing (HPC) in large-scale structural optimization. The discussion will cover, but is not limited to, subjects such as: How to get started with HPC for structural optimization, low level (MPI/PETSc) vs. high level (FEniCS, deal.ii, MFEM, etc.) frameworks, design of preconditioners - matrix vs. matrix-free, dynamics and multiphysics, structured vs. unstructured meshes, and remeshing in parallel and the use of accelerators (GPU/FPGA).

Organizer: Niels Aage, Technical University of Denmark, naage@mek.dtu.dk

Time: Monday, June 14, 10:00 AM – 11:00 AM MDT, Networking Lounge:

Coffee Break Room (Breakout 2)

Note: Sign-up is required; please, visit: Sign-up Page

Software design, development and management practices (Socializing 7)

This Roundtable focuses on all aspects of software design, development and management practices to produce Multidisciplinary Design, Analysis and Optimization (MDAO) software for High Performance Computing (HPC) applications. This Roundtable is a venue for researchers, developers and end-users from academia, industry and government to share experiences, ideas and best practices applied to HPC software development and operations. Topics of interest include, but are not limited to: Software development team management, Software development and operations, Software test repository management, Software design patterns, HPC software libraries, HPC algorithmic design, Performance portability, Open source software, Test driven development, Hybrid parallel computing, Parallel computing, and GPU acceleration.

Organizer: Miguel Aguilo, Sandia National Laboratories, maguilo@sandia.gov

Time: Wednesday, June 16, 9:00 PM – 10:00 PM MDT, Networking Lounge:

Coffee Break Room

Note: Sign-up is required; please, visit: Sign-up Page.

Artificial Intelligence and Machine Learning (Socializing 9)

This round table discusses challenges and opportunities in developing a coherent framework that enables blending conservation laws, physical principles, and/or phenomenological behaviors expressed by differential equations with the vast data sets available in many fields of engineering, science, and technology. At the intersection of probabilistic machine learning, deep learning, and scientific computations, we will discuss promising new directions for harnessing the long-standing developments of classical methods in applied mathematics

and mathematical physics to design learning machines with the ability to operate in complex domains without requiring large quantities of data. In particular, we will discuss three complementary directions: (1) data-efficient learning machines capable of leveraging the underlying laws of physics, expressed by time dependent and non-linear differential equations, to extract patterns from high-dimensional data generated from experiments, (2) novel numerical algorithms that can seamlessly blend equations and noisy multi-fidelity data, infer latent quantities of interest (e.g., the solution to a differential equation), and naturally quantify uncertainty in computations, and (3) machine learning optimization algorithms to accelerate design optimization under uncertainty. We will try to expose some open challenges in solving forward, inverse, data assimilation, design optimization, model discovery and uncertainty quantification problems using the emerging field of physics-informed machine learning.

Organizer: Raissi Maziar and Subhayan De, University of Colorado Boulder,

maziar.raissi@colorado.edu, subhayan.de@colorado.edu

Time: Thursday, June 17, 9:00 PM - 10:00 PM MDT, Networking Lounge:

Coffee Break Room

Note: Sign-up is required; please, visit: Sign-up Page.

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Program Overview

About the Conference Program

One of the primary challenges of a virtual international conference, such as WCSMO-14, is the diversity of the time zones of the participants.

To accommodate these different time zones, the sessions are grouped into two blocks: a morning block from 7:00- 11:00 AM US Mountain Daylight Time (MDT) and an afternoon block from 6:00 - 10:00 PM MST. A time conversion table is given below. An online tool to convert MDT times into local times can be found at: Time Zone Converting Tool

	Morning block 7:00 – 11:00 am MDT	Afternoon block 6:00 – 10:00 pm MDT
Sydney	11:00 PM – 3:00 AM	10:00 AM – 2:00 PM
Tokyo	10:00 PM – 2:00 AM	9:00 AM – 1:00 PM
Beijing	9:00 PM – 1:00 AM	8:00 AM – 12:00 PM
New Delhi	6:30 PM – 10:30 PM	5:30 AM – 9:30 AM
Moscow	4:00 PM – 8:00 PM	3:00 AM – 7:00 AM
Paris	3:00 PM – 7:00 PM	2:00 AM – 6:00 AM
São Paulo	10:00 AM – 2:00 PM	9:00 PM – 1:00 AM
New York	9:00 AM – 1:00 PM	8:00 PM – 12:00 AM
San Diego	6:00 AM – 10:00 AM	5:00 PM – 9:00 PM

The overall schedule is shown in the table below. For assignment of talks to sessions and sessions to time slots, we primarily considered the thematic fit but also the time zone of the presenter. Strictly assigning presenters to the most convenient time slot within the presenters business hours would have led to a geographically divided conference. Instead, to promote geographical diversity, we assigned presenters from East Asia to the early morning block slots. These slots do not require attendees from East Asia to stay up too late. This scheduling approach led to a slight imbalance between the two blocks with overall more presentations in the morning blocks. Furthermore, the originally schedule Friday evening block was no longer needed.

	Time (MDT)	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
~	7:00 – 7:50 AM		Plenary - 1	Parallel session	General Assembly	Parallel session	SOTA – Talks 2
g Block	8:00 – 8:50 AM		Parallel session				
Morning	9:00 – 9:50 AM		Parallel session				
2	10:00 – 11:00 AM		Socializing Events				
~	6:00 – 6:50 PM		Parallel session	Plenary - 2	Parallel session	SOTA – Talks 1	
Block	7:00 – 7:50 PM	Socializing Events	Parallel session	Parallel session	Parallel session	Parallel session	
Evening	8:00 – 8:50 PM		Parallel session	Parallel session	Parallel session	Parallel session	
ш	9:00 – 10:00 PM		Socializing Events	Socializing Events	Socializing Events	Socializing Events	

Presentations and Session Format

The recordings of the presentations will be available online through the conference platform from June 1, 2021, through August 1, 2021.

The technical sessions take place during the week of the conference, from June 13 through 18. Up to five 50-minute sessions run in parallel. Each session is assigned a Zoom room. At the beginning of a session, each presenter will briefly introduce her/his talk in no-more than two minutes. After this introduction, the session is split up into breakout rooms, one for each presenter. In these breakout rooms, presenters and participants can discuss the presenter's work. Participants can join the discussions of presentations of their interest, conveniently switching between sessions and presentations.

Participants are strongly encouraged to watch the recordings of the presentations and post questions prior to the live session featuring the presentations of interest.

Sunday - June 13, 2021

Evening Sessions -6:00 - 10:00 PM MDT

Time: 7:00 PM - 7:50 PM MDT

Room	Session
Lounge	Socializing - 1

Monday - June 14, 2021

Morning Sessions -7:00 - 11:00 AM MDT

Time: 7:00 AM - 7:50 AM MDT

Room	Session
Auditorium	Plenary - 1

Time: 8:00 AM - 8:50 AM MDT

Room	Session
A	Design optimization considering fracture, damage and fatigue - I
В	Inverse problems and parameter identification - I
\mathbf{C}	Design optimization for optics and electromagnetics applications - I
D	Design optimization of heat exchangers and other thermo-fluid applications - I
E	Multi-scale topology optimization - I

Time: 9:00 AM - 9:50 AM MDT

Room	Session
A	Design for biomedical applications - I
В	Robust design and reliability-based design optimization - I
\mathbf{C}	Design optimization for optics and electromagnetics applications - II
D	Design optimization of heat exchangers and other thermo-fluid applications - ${\rm II}$

E Multi-scale topology optimization - II

Time: 10:00 AM - 11:00 AM MDT

Room	Session
Lounge	Socializing - 2

Monday - June 14, 2021

Evening Sessions – 6:00 - 10:00 PM MDT

Time: 6:00 PM - 6:50 PM MDT

Room	Session
A	Design for biomedical applications - II
В	Robust design and reliability-based design optimization - II
С	Multi-scale topology optimization - III

Time: 7:00 PM - 7:50 PM MDT

Room	Session
A	Design optimization considering fracture, damage and fatigue - II
В	Inverse problems and parameter identification - II
\mathbf{C}	Robust design and reliability-based design optimization - III
D	Design optimization for optics and electromagnetics applications - III

Time: 8:00 PM - 8:50 PM MDT

Room	Session
A	Robust design and reliability-based design optimization - IV
В	Design optimization for optics and electromagnetics applications - IV
\mathbf{C}	Multi-scale topology optimization - IV

Time: 9:00 PM - 10:00 PM MDT

Room	Session
Lounge	Socializing - 3

Tuesday - June 15, 2021

Morning Sessions -7:00 - 11:00 AM MDT

Time: 7:00 AM - 7:50 AM MDT

Room	Session
A	Design of compliant mechanisms
В	Reduced-order models in design optimization
\mathbf{C}	Design optimization with applications to aerospace problems - I
D	Machine learning for design optimization - I
Е	Design optimization for advanced manufacturing - I

Time: 8:00 AM - 8:50 AM MDT

Room	Session
A	Raphael "Rafi" T. Haftka Memorial Session - I
В	Design optimization with applications to aerospace problems - II
С	Topology optimization for fluids - I
D	Machine learning for design optimization - II
E	Design optimization for advanced manufacturing - II

Time: 9:00 AM - 9:50 AM MDT

Room	Session
A	Raphael "Rafi" T. Haftka Memorial Session - II
В	Evolutionary and zero-order methods for structural optimization - I
C	Moving morphable component methods - I
D	Design optimization with applications to aerospace problems - III
\mathbf{E}	Design optimization for advanced manufacturing - III

Time: 10:00 AM - 11:00 AM MDT

Room	Session
Lounge	Socializing - 4

Tuesday - June 15, 2021

Evening Sessions – 6:00 - 10:00 PM MDT

Time: 6:00 PM - 6:50 PM MDT

Room	Session
Auditorium	Plenary - 2

Time: 7:00 PM - 7:50 PM MDT

Room	Session
A	Evolutionary and zero-order methods for structural optimization - II
В	Topology optimization for fluids - II
С	Design optimization of heat exchangers and other thermo-fluid applications - ${\it III}$

Time: 8:00 PM - 8:50 PM MDT

Room	Session
A	Moving morphable component methods - II
В	Topology optimization for fluids - III
С	Design optimization of heat exchangers and other thermo-fluid applications - ${\rm IV}$

Time: 9:00 PM - 10:00 PM MDT

Room	Session
Lounge	Socializing - 5

Wednesday - June 16, 2021

Morning Sessions – 7:00 - 11:00 AM MDT

Time: 7:00 AM - 7:50 AM MDT

Room	Session
Auditorium	ISSMO General Assembly

Time: 8:00 AM - 8:50 AM MDT

Room	Session
A	Isogeometric methods in design optimization
В	Optimization of contact and interface problems
\mathbf{C}	Design optimization accounting for material nonlinear behavior - I
D	Design optimization for civil enginering and architectural design - I
E	Design of composite structures - I

Time: 9:00 AM - 9:50 AM MDT

Room	Session
A	Topology optimization for solid mechanics
В	Design optimization accounting for material nonlinear behavior - ${\rm II}$
С	Design optimization for civil enginering and architectural design - II
D	Design of composite structures - II
E	Novel topology optimization techniques - I

Time: 10:00 AM - 11:00 AM MDT

Room	Session
Lounge	Socializing - 6

Wednesday - June 16, 2021

Evening Sessions – 6:00 - 10:00 PM MDT

Time: 6:00 PM - 6:50 PM MDT

Room	Session
A	Design of composite structures - III
В	Novel topology optimization techniques - II
\mathbf{C}	Machine learning for design optimization - III
D	Design optimization for advanced manufacturing - IV

Time: 7:00 PM - 7:50 PM MDT

Room	Session
A	Design of composite structures - IV
В	Novel topology optimization techniques - III
\mathbf{C}	Machine learning for design optimization - IV
D	Design optimization for advanced manufacturing - V

Time: 8:00 PM - 8:50 PM MDT

Room	Session
A	Design of composite structures - V
В	Novel topology optimization techniques - IV
\mathbf{C}	Machine learning for design optimization - V
D	Design optimization for advanced manufacturing - VI

Time: 9:00 PM - 10:00 PM MDT

Room	Session
Lounge	Socializing - 7

Thursday - June 17, 2021

Morning Sessions – 7:00 - 11:00 AM MDT

Time: 7:00 AM - 7:50 AM MDT

|--|--|--|

A	Multi-objective topology optimization
В	Level set methods
С	Design optimization of acoustic materials and devices - I
D	Shape optimization - I
E	Design optimization considering eigenfrequency and dynamics - I

Time: 8:00 AM - 8:50 AM MDT

Room	Session
A	Design optimization with applications to automotive problems - I
В	Design of metamaterials - I
\mathbf{C}	Surrogate modeling for design optimization - I
D	Shape optimization - II
E	Design optimization considering eigenfrequency and dynamics - II

Time: 9:00 AM - 9:50 AM MDT

Room	Session
A	Stress-constrained topology optimization - I
В	Design optimization with applications to automotive problems - II
С	Shape optimization - III
D	Design optimization considering eigenfrequency and dynamics - ${ m III}$
E	Novel topology optimization techniques - V

Time: 10:00 AM - 11:00 AM MDT

Room	Session
Lounge	Socializing - 8

Thursday - June 17, 2021

Evening Sessions -6:00 - 10:00 PM MDT

Time: 6:00 PM - 6:50 PM MDT

Room	Session
Auditorium	SOTA Talks - 1

Time: 7:00 PM - 7:50 PM MDT

Room	Session
A	Stress-constrained topology optimization - II
В	Design optimization of acoustic materials and devices - II
\mathbf{C}	Design of metamaterials - II
D	Design optimization for advanced manufacturing - VII

Time: 8:00 PM - 8:50 PM MDT

Room	Session
A	Surrogate modeling for design optimization - II
В	Design optimization considering eigenfrequency and dynamics - IV
\mathbf{C}	Machine learning for design optimization - VI

Time: 9:00 PM - 10:00 PM MDT

Room	Session
Lounge	Socializing - 9

Friday - June 18, 2021

Morning Sessions – 7:00 - 11:00 AM MDT

Time: 7:00 AM - 7:50 AM MDT

Room	Session
Auditorium	SOTA Talks - 2

Time: 8:00 AM - 8:50 AM MDT

Room	Session
A	Multi-material topology optimization

В	Software
\mathbf{C}	Truss topology optimization - I
D	Topology optimization considering uncertainty - I
E	Optimization algorithms - I

Time: 9:00 AM - 9:50 AM MDT

Room	Session
A	Topology optimization with manufacturing constraints
В	Truss topology optimization - II
\mathbf{C}	Topology optimization considering uncertainty - II
D	Optimization algorithms - II

Time: 10:00 AM - 11:00 AM MDT

Room	Session
Lounge	Socializing - 10

Detailed Program

Sunday - June 13, 2021

Evening Sessions – 6:00 - 10:00 PM MDT

Socializing - 1

Day: Sunday - June 13, 2021 Time: 7:00 PM - 7:50 PM MDT

Room: Lounge

Event	Organizer
ISSMO Women Networking I (Coffee Break Room)	X. Shelly Zhang

Monday - June 14, 2021

Morning Sessions -7:00 - 11:00 AM MDT

Plenary - 1

Day: Monday - June 14, 2021

Time: 7:00 AM - 7:50 AM MDT

Room: Auditorium Chair: Wei Chen

Title Presenter

Structural Optimization. Questions from Boeing Vladimir Balabanov

Design optimization considering fracture, damage and fatigue - I

Day: Monday - June 14, 2021 Time: 8:00 AM - 8:50 AM MDT

Room: A

Chair and co-Chair: Marco Montemurro and Alejandro Aragón

ID	Title	Presenter
93	Topology optimization of damage-resistant structures with a predefined load-bearing capacity	Tobias Barbier
	by Barbier, T., Shakour, E., Sigmund, O., Lombaert, G. and Schevenels, M.	
143	Fail-safe optimization of 3D tubular frame structures under stress and fatigue constraints	Suguang Dou
	by Dou, S. and Stolpe, M.	
207	First-Order Reliability Approach for Fatigue Resistant Topology Optimization of Elastoplastic Structures	Piotr Tauzowski
	by Logo, J., Tauzowski, P. and Blachowski, B.	
254	Formulation of fatigue strength criteria in a topology op- timisation method based on NURBS hyper-surfaces	Khalil Refai
	by Refai, K. and Montemurro, M.	
418	Topology optimization in fracture mechanics using a level-set method	Jeet Desai
	by Desai, J., Allaire, G. and Jouve, F.	
479	Material Optimization to Enhance Delamination Resistance of Heterogeneous Structures	Sukhminder Singh
	by Singh, S., Pflug, L. and Stingl, M.	

Inverse problems and parameter identification - I

Day: Monday - June 14, 2021 Time: 8:00 AM - 8:50 AM MDT

Room: B

Chair and co-Chair: Paolo Venini and Akira Saito

ID	Title	Presenter
92	Numerical experiments for cavity shape identification analysis using hammering test data based on level-set type topology optimization	Takahiko Kurahashi
	by Kurahashi, T., Murakami, Y., Toyama, S., Ikeda, F., Iyama, T. and Ihara, I.	
94	An efficient inverse strategy to estimate loading from strain measurements	Daniel Wilke
	by Wilke, D. N. and Kok, S.	
208	Identification of the dynamic response of storage racks: experiments and optimization	Paolo Venini
	by Bernuzzi, C., Rottenbacher, C., Simoncelli, M. and Venini, P.	
253	An efficient structural parameter identification method considering non-probabilistic uncertainties and correla- tions	Heng Ouyang
	by Ouyang, H., Liu, J. and Han, X.	
260	An enhanced framework of model calibration using the modular Bayesian approach for identifiability problem	Hwisang Jo
	by Jo, H. and Lee, I.	
288	Effects of mode shapes on crack identification based on finite-element model updating and inverse eigenvalue analysis	Jun Isshiki
	by Isshiki, J. and Saito, A.	
370	A Robust Design Framework for Sensor Number and Placement Optimization under Uncertainty in Vibration-Based Damage Detection of Composite Struc- tures	Haichao An
	by An, H., Youn, B. D. and Kim, H. S.	

Design optimization for optics and electromagnetics applications - I

Day: Monday - June 14, 2021

Time: 8:00 AM - 8:50 AM MDT

Room: C

Chair and co-Chair: Rasmus Christiansen and Niels Aage

ID	Title	Presenter
17	Shape Optimization for Electromagnetic Applications in the Frequency Domain	Kristian Jensen
	by Jensen, K. E.	
60	Two-layer design for microwave scattering structure using a conductive material and dielectric materials	Mingook Jung
	by Jung, M. and Yoo, J.	
173	Shape optimization for the strong routing of light	Juan Carlos Araujo Cabarcas
	by Araújo C., J. C. and Wadbro, E.	
189	Multi-Physics Topology Optimization of Photonic Bandgap Metamaterials with Elasticity and Thermal Conductivity Constraints	Kenneth Swartz
	by Swartz, K. E., White, D. A., Tortorelli, D. A. and James, K. A.	
468	Shape optimization of a rotating electric machine using a space-time finite element method	Alessio Cesarano
	by Cesarano, A. and Gangl, P.	

Design optimization of heat exchangers and other thermo-fluid applications - I

Day: Monday - June 14, 2021 Time: 8:00 AM - 8:50 AM MDT

Room: D

Chair and co-Chair: Fengwen Wang and Lise Noel

ID	Title	Presenter
61	Topology optimization of a surface cooler using a continuous adjoint turbulence model	Quentin Holka
	by Quentin, H., Ephraïm, T., Julien, C., Boutros, G. and Maroun, N.	
95	Topography optimisation for parallel plate heat exchangers	Joe Alexandersen
	by Alexandersen, J.	
140	Topology optimization for conjugated heat transfer based on Darcy flow analysis in industrial software	Robert Dienemann
	by Dienemann, R., Pagaldipti, N. and Zhou, M.	
182	Reaction-Diffusion Equation-based Topology Optimiza- tion: a novel framework for 2D and 3D Thermal Fluid- Structure System Design	Hao Li
	by Li, H., Kondoh, T., Jolivet, P., Yamada, T., Izui, K., Nishiwaki, S. and Furuta, K.	
268	On topology optimization of two fluid heat exchangers and their post-evaluation	Casper Andreasen
	by Andreasen, C. S., Rogié, B. and Høghøj, L.	

Multi-scale topology optimization - I

Day: Monday - June 14, 2021 Time: 8:00 AM - 8:50 AM MDT

Room: E

Chair and co-Chair: Ole Sigmund and Jun Wu

ID	Title	Presenter
115	Two-scale Concurrent Structural Topology Optimization with Connectable Microstructures	Pai Liu
	by Liu, P., Kang, Z. and Luo, Y.	
128	On the utility of cellular designs in mechanical and thermal applications in the context of powder-based additive manufacturing	Bich Ngoc Vu
	by Vu, B. N., Wein, F. and Stingl, M.	
190	Optimal and continuous multilattice embedding	Emily Sanders
	by Sanders, E. D., Pereira, A. and Paulino, G. H.	
252	Isogeometric Optimisation of Lattice-Skin Structures	Xiao Xiao
	by Xiao, X. and Cirak, F.	
449	Multiscale design of coated structures with periodic infill for vibration suppression	Eddie Wadbro
	by Wadbro, E. and Niu, B.	

Design for biomedical applications - I

Day: Monday - June 14, 2021 Time:

9:00 AM - 9:50 AM MDT

Room:

Chair and co-Chair: Qing Li and Sandilya Kambampati

ID	Title	Presenter
187	Growth-Driven Optimization of Bone Scaffolds	David Cohen
	by Cohen, D., Aboutaleb, S. M., Johnson, A. W. and Norato, J.	
201	${\it Multi-objective~design~optimization~of~3D~microarchitec-} \\tured~implants$	Eric Garner
	by Garner, E., Wu, J. and Zadpoor, A.	
266	Topology Optimization using PETSc: a Python wrapper and extended functionality for the design of biomechan- ical structures	Thijs Smit
	by Aage, N., Ferguson, S. J. and Helgason, B.	
439	Level set topology optimization for artificial tissue vas- cularization	Douglas de Aquino Castro
	by Castro, D. d. A., Kambampati, S. and Kim, H. A.	
478	Adjoint shape optimization for hyperelastic structures and fluid-structure interaction	Lars Radtke
	by Radtke, L., Heners, J. P., Bletsos, G., Rung, T. and Duester, A.	

Robust design and reliability-based design optimization - I

Day: Monday - June 14, 2021 Time: 9:00 AM - 9:50 AM MDT

Room: B

Chair and co-Chair: Christian Gogu and Junho Chun

ID	Title	Presenter
50	Robust Design Optimization with Design-Dependent Random Input Variables using the Reciprocal First- Order Second-Moment Method	Benedikt Krieges- mann
	by Kriegesmann, B.	
463	A Kriging-assisted Hybrid Adaptive Single Loop Approach for Reliability-based Design Optimization	Dequan Zhang
	by Zhang, D., Yang, M. and Han, X.	
495	Robust optimization and design space visualization applied on drivetrain design	Jan Stroobants
	by Stroobants, J., López, C. and Abedrabbo, G.	
548	A Robust Beam Model for Nonlinear Structural Analysis of Highly Flexible Aircraft Wings through Adaptive Preconditioning	David Solano
	by Solano, D., Sarojini, D., Rajaram, D. and Mavris, D.	

Design optimization for optics and electromagnetics applications - II

Day: Monday - June 14, 2021

Time: 9:00 AM - 9:50 AM MDT

Room: C

Chair and co-Chair: Fred van Keulen and Martin Berggren

ID	Title	Presenter
271	General method for computing fundamental performance bounds for photonic design problems	Pengning Chao
	by Chao, P., Molesky, S. and Rodriguez, A.	
298	Optimizing the electro-momentum coupling in piezoelectric composites	Majd Kosta
	by Kosta, M., Muhafra, A., Pernas-Salomon, R., Amir, O. and Shmuel, G.	
371	3D-Printable Large-Area Metalenses Designed using Full-Maxwell based Topology Optimization	Rasmus Christiansen
	by Christiansen, R. E., Lin, Z., Roques-Carmes, C., Soljacic, M. and Johnson, S. G.	
373	Non-parametric shape optimization for electromagnetic applications	Stefan Reitzinger
	by Reitzinger, S., Pedersen, C. B., Lange, E., Hoffarth, M. and Stoppelkamp, N.	
498	Topology optimization of microwave frequency multiplexers	Ahmad Bokhari
	by Bokhari, A. H., Hassan, E. and Wadbro, E.	

Design optimization of heat exchangers and other thermo-fluid applications - II

Day: Monday - June 14, 2021

Time: 9:00 AM - 9:50 AM MDT

Room: D

Chair and co-Chair: Casper Andreasen and Joe Alexandersen

ID	Title	Presenter
141	Topology optimization of fluid-to-fluid heat exchangers with body-fitted meshes	Grégoire Allaire
	by Allaire, G., Dapogny, C., Feppon, F. and Jolivet, P.	
176	2.5D Topology Optimization of Heat Sinks with Extruded Fins	Brice Rogie
	by Rogie, B., Høghøj, L. and Andreasen, C.	
185	Topology Optimization of 2D Heat Exchangers for Improving Heat Exchange Performance based on Isogeometric Analysis	Xuan Liang
	by Liang, X., Li, A., Rollett, A. and Zhang, Y. J.	
408	XIGA Level Set-based Topology Optimization for Conjugate Heat Transfer Problems	Lise Noel
	by Noel, L., Schmidt, M., Doble, K., Evans, J. A. and Maute, K.	

Multi-scale topology optimization - II

Day: Monday - June 14, 2021

Time: 9:00 AM - 9:50 AM MDT

Room: E

Chair and co-Chair: Jun Wu and Oliver Weeger

ID	Title	Presenter
212	Surrogate models of elastic responses from truss lattices for multiscale design	Charles Jekel
	by Jekel, C. F., Swartz, K., White, D. A., Tortorelli, D. A. and Watts, S.	
249	Hierarchical Topology Optimization of Stiffened Thinwalled Structures	Zitong Zhou
	by Zhou, Z., Wang, B., Zhou, Y., Hao, P. and Shi, Y.	
465	Towards Two-Scale Topology Optimization respecting Buckling on Micro- and Macroscale	Daniel Hübner
	by Hübner, D., Wein, F. and Stingl, M.	
521	Stress minimization for lattice structures	Alex Ferrer
	by Ferrer, A., Geoffroy-Donders, P. and Allaire, G.	
555	Topology Optimization of Functionally Graded Porous Structures under Transient Loads	Francisco Ramírez-Gil
	by Ramírez-Gil, F. J. and Montealegre-Rubio, W.	

Socializing - 2

Day: Monday - June 14, 2021

Time: 10:00 AM - 11:00 AM MDT

Room: Lounge

Event	Organizer
The Altair Conference Talk Show I - Guests: Wei Chen, Glaucio Paulino, Ole Sigmund (Coffee Break Room - Breakout 1)	Kurt Maute
Roundtable: High Performance Computing (HPC) in large- scale structural optimization (Room: Coffee Break Room - Breakout 2)	Niels Aage

Monday - June 14, 2021

Evening Sessions -6:00 - 10:00 PM MDT

Design for biomedical applications - ${\bf II}$

Day: Monday - June 14, 2021 Time: 6:00 PM - 6:50 PM MDT

Room: A

Chair and co-Chair: Shapour Azarm and Julian Norato

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ID	Title	Presenter
264	An Overview of Optimization Studies Related to COVID-19	Elizabeth Jordan
	by Jordan, E., Shin, D. E. and Azarm, S.	
432	Analysis and Non-deterministic Optimization of Coronary stents under biological and surgical uncertainties	Nai Chun Liu
	by Liu, N. C., Wilson, T., Swain, M. and Li, Q.	
442	Identification of a bone growth for an individual patient of idiopathic scoliosis based on medical image data	Yasutaka Mitsumoto
	by Mitsumoto, Y., Nishikawa, K. and Azegami, H.	
471	Topology optimization of prosthetic structures for bone remodeling criteria	Qing Li
	by Wu, C., Fang, J., Sun, G., Swain, M. V., Steven, G. P. and Li, Q.	
487	Optimization of the Walking Pattern by Utilizing Base Motions Through Singular Value Decomposition	Cem Guzelbulut
	by Guzelbulut, C., Suzuki, K., Hobara, H. and Shimono, S.	
559	Topology Optimization incorporating Nonlinear Material and Geometry applied to Coronary Stents	Thomas Wilson
	by Wilson, T. J., Thomas, S., Steven, G. P. and Li, Q.	

Robust design and reliability-based design optimization - II

Day: Monday - June 14, 2021 Time: 6:00 PM - 6:50 PM MDT

Room: B

Chair and co-Chair: Alireza Doostan and Weifei Hu

ID	Title	Presenter
27	Exact analytical PDFs of responses and reliabilities for stochastic static and dynamic systems	Jiaran Liu
	by Liu, J., Zhou, Z., Chen, G. and Yang, D.	
45	Static and dynamic reliability-based design optimization with multiple most probable points based on direct probability integral method	Xiaolan Li
	by Li, X., Chen, G., Wang, Y. and Yang, D.	
58	A novel saddlepoint approximation and its application to structural reliability-based design optimization	Bach Do
	by Do, B. and Ohsaki, M.	
368	Reliability-Based Design Optimization Using Gaussian Process of Pouch Battery Pack in Stack Pressure Per- spective	Hyunhee Choi
	by Choi, H., Son, H., Choi, Y. H., Youn, B. D. and Lee, G.	

Multi-scale topology optimization - III

Day: Monday - June 14, 2021 Time: 6:00 PM - 6:50 PM MDT

Room: C

Chair and co-Chair: Bin Niu and Mingdong Zhou

ID	Title	Presenter
296	Smooth Material Representation for the Multi-scale Topology Optimization Method by Deep Semantic Fea- ture Learning	Minsik Seo
	by Seo, M. and Min, S.	
342	Multi-scale Topology Design of Porous Heterogeneous Material-structure	Xiaonan Su
	by Chen, W., Su, X. and Liu, S.	
369	Concurrent topology optimization for cellular high conductive heat sink with high stiffness	Musaddiq Al Ali
	by Ali, M. A. and Shimoda, M.	
563	Multiscale Topology Optimization via Multiscale Optimization Problems and Neural Network Surrogate Models	Joel Najmon
	by Najmon, J. C., Valladares, H. and Tovar, A.	

Design optimization considering fracture, damage and fatigue - II

Day: Monday - June 14, 2021

Time: 7:00 PM - 7:50 PM MDT

Room: A

Chair and co-Chair: Junji Kato and Andres Tovar

ID	Title	Presenter
291	A path-dependent level set periodic topology optimization with fracture criterion	Simon Thomas
	by Thomas, S., Wu, C., Steven, G. and Li, Q.	
356	Damage identification from noisy frequency responses using topology optimization and lasso regularization	Akira Saito
	by Saito, A., Sugai, R. and Saomoto, H.	
429	Topology optimization for controlling crack propagation angle	Yupeng Sun
	by Sun, Y., Yao, S., Xiong, Y. and Hu, J.	
431	Data-driven and Topological Design of Structural Meta- materials for Fracture Resistance	Daicong Da
	by Da, D., Wang, L., Chan, Y. and Chen, W.	
484	Fundamental study of topology optimization for brittle- ductile composites	Hiroya Hoshiba
	by Hoshiba, H. and Kato, J.	

Inverse problems and parameter identification - II

Day: Monday - June 14, 2021 Time: 7:00 PM - 7:50 PM MDT

Room: B

Chair and co-Chair: Ikjin Lee and Jaeyub Hyun

ID	Title	Presenter
149	Inverse Design of Spatial Phase Modulation for Programmable Localization in Plasmonic Metasurface	Doksoo Lee
	by Lee, D., Jiang, S., Balogun, O. and Chen, W.	
324	Constraint Autoencoder Dimension Reduction Method for Inverse Problem	Zhiping Hou
	by Hou, Z., Duan, S., Han, X. and Liu, G.	
361	Uncertainty Inverse Method for Parameters Identifica- tion of Robot Arms Based on Two-way Neural Network	Lutong Shi
	by lutong, S., Shuyong, D., Li, W., Xu, H. and Guirong, L.	
426	A Model Updating Framework for Digital Twin with An Insufficient Prior Knowledge	Wongon Kim
	by Kim, W. and Youn, B. D.	
444	Comparison of statistical validation metrics for accurate validation with hypothesis testing	Hyejeong Son
	by Son, H., Choi, H., Lee, G. and Youn, B. D.	

Robust design and reliability-based design optimization - III

Day: Monday - June 14, 2021 Time: 7:00 PM - 7:50 PM MDT

Room:

Chair and co-Chair: Weifei Hu and Chao Hu

ID	Title	Presenter
25	Robust optimization of structures under unilateral contacts with uncertain initial gaps	Yoshihiro Kanno
	by Kanno, Y.	
53	Direct probability integral method for uncertainty quantification and design optimization of structures	Dixiong Yang
	by Yang, D. and Chen, G.	
111	An Efficient Gradient-Based Method for Reliability- Based Design Optimization Combined with Probability Density Evolution Method	Lili Weng
	by Weng, L., Yang, J. and Chen, J.	
290	Sequentially Approximated Feasibility Robustness with Scenario Generation and Optimization	Randall Kania
	by Kania, R. and Azarm, S.	
535	Robust design optimization using interpretable self- organizing map	Deepak Nagar
	by Nagar, D., Pannerselvam, K. and Ramu, P.	

Design optimization for optics and electromagnetics applications - III

Day: Monday - June 14, 2021 Time: 7:00 PM - 7:50 PM MDT

Room: D

Chair and co-Chair: Yongbo Deng and Tae Hee Lee

ID	Title	Presenter
137	A magneto-structural topology optimization method with additive manufacturing constraints	Yingchun Bai
	by Bai, Y. and Wang, Z.	
316	Topology Optimization for Operating Efficiency of PM Machines under Driving Cycle	Won Seok Song
	by Song, W. S., Ahn, S. and Min, S.	
383	Topology optimization of supercapacitors.	Miguel Salazar de Troya
	by Troya, M. S. d., Beck, V. and Worsley, M.	
424	A topology optimisation in large-scale multi-particle systems based on the scattering matrix method	Kei Matsushima
	by Matsushima, K., Isakari, H., Takahashi, T. and Matsumoto, T.	

Robust design and reliability-based design optimization - ${\rm IV}$

Day: Monday - June 14, 2021 Time: 8:00 PM - 8:50 PM MDT

Room: A

Chair and co-Chair: Yoshihiro Kanno and Dixiong Yang

ID	Title	Presenter
26	An aerodynamic metamodeling and optimization method using point cloud deep neural network	Li Chao
	by Li, C., Zhang, L., Ren, C. and Xiong, F.	
146	An Efficient Approach for Dynamic-Reliability-Based Design Optimization Using the Probability Density Evo- lution Method	Jiashu Yang
	by Yang, J., Chen, J. and Jensen, H.	
154	Active learning Kriging strategy for reliability-based and robust design optimization	Zeng Meng
	by Meng, Z., Wang, X. and Ren, S.	
486	L-moments driven Bayesian inference for risk analysis with scarce samples in the presence of extremes	Deepan Jayaraman
	by Jayaraman, D. and Ramu, P.	
560	Stochastic Crashworthiness Optimization Accounting for Simulation Noise and Random Parameters	Seyed Saeed Ahmadis- oleymani
	by Ahmadisoleymani, S. S. and Missoum, S.	
565	Topology Optimization of Lattice-like Materials and Structures Considering Uncertainty	Seyed Ardalan Nejat
	by Nejat, S. A., Guest, J. K., Tootkaboni, M. and Asadpoure, A.	

Design optimization for optics and electromagnetics applications - ${\rm IV}$

Day: Monday - June 14, 2021 Time: 8:00 PM - 8:50 PM MDT

Room: B

Chair and co-Chair: Gil Ho Yoon and Boyan Lazarov

ID	Title	Presenter
349	Multi-fidelity model based size optimization of electro- magnetic machine	Sungho Ahn
	by Ahn, S. and Min, S.	
438	Electromagnetic-acoustic biphysical invisibility cloak via CMA-ES based topology optimization	Garuda Fujii
	by Fujii, G.	

Multi-scale topology optimization - IV

Day: Monday - June 14, 2021 Time: 8:00 PM - 8:50 PM MDT

Room: C

Chair and co-Chair: Gengdong Cheng and Yuqing Zhou

ID	Title	Presenter
436	Graded Porous Structures Design via a Multi-material and Multi-porosity Topology Optimization Approach	Zhi Zhao
	by Zhao, Z. and Zhang, X. S.	
475	Multi-scale topology optimization applying FFT-based homogenization approach	Masayoshi Matsui
	by Matsui, M., Hoshiba, H., Nishiguchi, K., Kato, J. and Ogura, H.	
485	Multiscale topology optimization of anisotropic composite structures for compliant mechanism design	Jaewook Lee
	by Lee, J.	
493	Two-scale optimization and de-homogenization of spatially graded lattice structures	Liang Xu
	by Xu, L.	
512	Band Gap Design of Lattice Infilled Structures using Topology Optimization and Experimental Material In- terpolation Model	Jianbin Du
	by Liang, X. and Du, J.	

Socializing - 3

Day: Monday - June 14, 2021 Time: 9:00 PM - 10:00 PM MDT

Room: Lounge

Event Organizer

The Altair Conference Talk Show II - Guests: Gengdong Kurt Maute

Cheng, Yoon Young Kim, Daniel Tortorelli (Coffee Break

Room)

Tuesday - June 15, 2021

Morning Sessions -7:00 - 11:00 AM MDT

Design of compliant mechanisms

Day: Tuesday - June 15, 2021

Time: 7:00 AM - 7:50 AM MDT

Room: A

Chair and co-Chair: Ole Sigmund and Takayuki Yamada

ID	Title	Presenter
235	Topology optimization of flexures: a simple and versatile formulation	Stijn Koppen
	by Koppen, S., Langelaar, M. and Keulen, F. v.	
246	Design of flexoelectric structures via explicit topology op- timization	Xiaoye Yan
	by Yan, X., Zhang, W. and Guo, X.	
385	Topology optimization designs of Multi-Input-Multi- Output hinge-free compliant mechanisms under buckling constraints	Jianhua Rong
	by Jianhua, R. and Wei, G.	
427	Topology Optimization for Multi-layered Morphing Wing Structure Using Distance Function	Hiroaki Tanaka
	by Tanaka, H., Yamada, M., Kogiso, N. and Yamada, T.	

Reduced-order models in design optimization

Day: Tuesday - June 15, 2021 Time: 7:00 AM - 7:50 AM MDT

Room: B

Chair and co-Chair: Youngsoo Choi and Mattias Schevenels

ID	Title	Presenter
102	Multi-Fidelity Reduced-Order Modeling Applied to Structural Simulations	Darshan Sarojini
	by Perron, C., Sarojini, D., Rajaram, D., Corman, J. and Mavris, D.	
148	Accelerating design optimization using reduced order models	Youngsoo Choi
	by Choi, Y.	
379	Spurious modes elimination in ROM-based topology op- timization of geometrically nonlinear structures	Lidan Zhang
	by Zhang, L. and van Keulen, F.	
384	Acceleration of shape optimization analysis using model order reduction by Karhunen-Loeve expansion	Shuichi Tango
	by Shimomoto, T. and Azegami, H.	
578	Automatic reduced order model generation of multi- phisics problems using the hypercomplex finite element method.	Manuel Garcia
	by Aristizabal, M. and Garcia, M.	

Design optimization with applications to aerospace problems - I

Day: Tuesday - June 15, 2021 Time: 7:00 AM - 7:50 AM MDT

Room: C

Chair and co-Chair: Hai Huang and Renato Picelli

ID	Title	Presenter
180	All-At-Once MDO formulation for coupled optimization of launch vehicle design and its trajectory using a pseudo spectral method	Jorge Valderrama
	by Valderrama, J., Brevault, L., Balesdent, M. and Urbano, A.	
211	Multifidelity Learning for the Design of Re-Entry Capsules	Francesco Di Fiore
	by Di Fiore, F., Maggiore, P. and Mainini, L.	
344	Multidisciplinary design optimization for compressor blisk under fatigue-creep reliability constraints	Hongxin Zhang
	by Zhang, H. and Zhang, X.	

Machine learning for design optimization - I

Day: Tuesday - June 15, 2021 Time: 7:00 AM - 7:50 AM MDT

Room: D

Chair and co-Chair: Makoto Ohsaki and Chao Hu

ID	Title	Presenter
10	Machine learning based optimization of remodeling parameters for predicting bone formation in synthetic scaffolds	Chi Wu
	by Wu, C.	
72	Cross-section optimization of steel frames using graph- based reinforcement learning	Kazuki Hayashi
	by Hayashi, K. and Ohsaki, M.	
136	A Local Approach of Deep Learning for Accelerated Topology Optimizations with Broad Applicability	Niklas Hartrumpf
	by Hartrumpf, N., Fiebig, S. and Franke, T.	
327	Automotive crashworthiness optimisation using machine learning to emulate engineering expertise	Moritz Frenzel
	by Frenzel, M., Ollar, J., Büttner, C., Finotto, V. C. and FlieSSer, M.	
374	Machine Learning Derived Graded Lattice Structures	Jier Wang
	by Wang, J. and Panesar, A.	

Design optimization for advanced manufacturing - I

Day: Tuesday - June 15, 2021 Time: 7:00 AM - 7:50 AM MDT

Room: E

Chair and co-Chair: Matthijs Langelaar and Hesaneh Kazemi

ID	Title	Presenter
44	Space-time topology optimization using thermal regular- ization for the fabrication sequence	Weiming Wang
	by Wang, W., Keulen, F. v. and Wu, J.	
82	Optimal Toolpath Design of Additive Manufactured Composite Cylindrical Structures	Luis Felipe Fernandez Ayala
	by Fernandez, F., Lewicki, J. P. and Tortorelli, D. A.	
116	Imposing nozzle size restrictions in topology optimiza- tion for additive manufacturing	Eduardo Fernandez
	by Fernandez, E., Ayas, C., Langelaar, M. and Duysinx, P.	
123	Topology optimization in metal additive manufacturing using an inherent strain based simulation	Martin Bihr
	by Bihr, M., Allaire, G., Bogosel, B., Betbeder-Lauque, X. and Bordeu, F.	
456	Minimizing intersecting features through topology opti- mization for Direct Metal Deposition	Vibhas Mishra
	by Mishra, V., Ayas, C., Langelaar, M. and Keulen, F. v.	
464	Topology Optimization with Generalized Geometric Pro- jection: extension to Additive Layer Manufacturing self- supported designs	Gabriele Capasso
	by Capasso, G., Coniglio, S., Bhat, K. V., Gogu, C. and Morlier, J.	

Raphael "Rafi" T. Haftka Memorial Session - I

Day: Tuesday - June 15, 2021 Time: 8:00 AM - 8:50 AM MDT

Room: A

Chair: Nam-Ho Kim

ID	Title	Presenter
135	Inverse Method for Static Load Reconstruction with Sensitivity Filtering and Optimal Sensor Placement	Mari Hanekom
	by Hanekom, M.	
430	Flight Control Surface Optimization with Optimal Rib Placement	Vladimir Gantovnik
	by Gantovnik, V. and Kataoka, M.	
476	Simultaneous size, layout and topology optimization of stiffened panels under stress and buckling constraints	Sheng Chu
	by Chu, S., Featherston, C. and Kim, H. A.	
569	Composite Optimization - From Ply-Tailoring Concept to Stacking Sequence Details	Ming Zhou
	by Zhou, M. and Fleury, R.	

Design optimization with applications to aerospace problems - II

Day: Tuesday - June 15, 2021

Time: 8:00 AM - 8:50 AM MDT

Room: B

Chair and co-Chair: Peter Dunning and Axel Schumacher

ID	Title	Presenter
87	Uncertainty quantification for multidisciplinary launch vehicle design using model order reduction and spectral methods	Loic Brevault
	by Brevault, L. and Balesdent, M.	
100	An efficient hybrid method for aeroelastic optimization of 3D-curved surfaces laminates	Daniel Milbrath De Leon
	by Souza, C. E. d. and Leon, D. M. D.	
177	Coupled topology and shape optimization of wings	Lukas Christian Høghøj
	by Høghøj, L. C., Conlan-Smith, C., Träff, E. A., Sigmund, O., Aage, N. and Andreasen, C. S.	
308	On the numerical accuracy of low- and high-order panel methods in shape optimization	Cian Conlan-Smith
	by Conlan-Smith, C., Sigmund, O. and Andreasen, C. S.	
309	Thermal Simulation and Optimization of an Electro- Hydrostatic Actuator to reduce Component Tempera- tures	Simon Knecht
	by Knecht, S. and Albers, A.	

Topology optimization for fluids - I

Day: Tuesday - June 15, 2021 Time: 8:00 AM - 8:50 AM MDT

Room: C

Chair and co-Chair: Joe Alexandersen and Georg Pingen

ID	Title	Presenter
43	Design of structure subject to non-Newtonian fluid- structure interaction loads using topology optimization of binary structure	Shahin Ranjbarzadeh
	by Ranjbarzadeh, S., Picelli, R. and Silva, E. C. N.	
250	Level set topology optimization for Fluid-Structure Interactions	Andreas Neofytou
	by Neofytou, A., Yu, F., Zhang, L. T. and Kim, H. A.	
332	3D Topology Optimization of Spacers in a Reverse Osmosis Channel	Sicheng Sun
	by Sun, S. and Qian, X.	
355	${\it Multi-shape\ optimization\ in\ two-dimensional\ Stokes\ flow}$	Tim Suchan
	by Suchan, T. and Welker, K.	
402	Improved flow and pressure field accuracy in topology optimization through volume averaging	Maarten Theulings
	by Langelaar, M. and van Keulen, F.	

Machine learning for design optimization - II

Day: Tuesday - June 15, 2021 Time: 8:00 AM - 8:50 AM MDT

Room: D

Chair and co-Chair: Glaucio Paulino and Hongyi Xu

ID	Title	Presenter
142	AI assisted optimization of highly non-linear systems on hand of vehicle frontal crash study	Jens Trilling
	by Trilling, J., Schumacher, A. and Zhou, M.	
223	$Generating\ high-resolution\ optimal\ topology\ using\ autoencoder$	Seungjun Lee
	by Lee, S., Kim, H. and Min, S.	
357	De-homogenization using Convolutional Neural Networks	Ole Sigmund
	by Elingaard, M. O., Bærentzen, J. A., Aage, N. and Sigmund, O.	
377	Multiclass Blending and Data-Driven Topology Opti- mization for Functionally Graded Structures	Yu-Chin Chan
	by Chan, Y., Wang, L., Da, D. and Chen, W.	

Design optimization for advanced manufacturing - II

Day: Tuesday - June 15, 2021
Time: 8:00 AM - 8:50 AM MDT

Room: E

Chair and co-Chair: Eddie Wadbro and Josephine Carstensen

ID	Title	Presenter
122	Topology and print orientation optimization for additively manufactured products subjected to fatigue constraints	Erik Lund
	by Hermansen, S. M., Olesen, A. M. and Lund, E.	
124	Topology Optimization of supports with imperfect bonding in Additive Manufacturing	Matías Godoy
	by Godoy, M., Bogosel, B. and Allaire, G.	
179	Optimization of support structures for reducing thermal displacements in SLA	Christiaan Mommeyer
	by Mommeyer, C., Ruelens, W., Craeghs, T., Lombaert, G. and Schevenels, M.	
365	Experimental Investigation of Topology-Optimized Beams with Anisotropic Base Materials	Hajin Kim
	by Kim, H. and Carstensen, J.	
549	Drainage filter for topology optimization of cleanable parts	Reinier Giele
	by Giele, R., Langelaar, M. and Keulen, F. v.	

Raphael "Rafi" T. Haftka Memorial Session - II

Day: Tuesday - June 15, 2021 Time: 9:00 AM - 9:50 AM MDT

Room: A

Chair: Nam-Ho Kim

ID	Title	Presenter
539	Generalized Multifidelity Active Learning Framework for Gaussian-Process-Based Reliability Analysis	Anirban Chaudhuri
	by Chaudhuri, A. and Willcox, K. E.	
580	The complex-step derivative approximation 20 years later	Joaquim Martins
	by Martins, J. R. R. A., Anibal, J. and Yildirim, A.	

Evolutionary and zero-order methods for structural optimization - I

Day: Tuesday - June 15, 2021

Time: 9:00 AM - 9:50 AM MDT

Room:

Chair and co-Chair: Andres Tovar and Chih-Hsing Liu

ID	Title	Presenter
32	Stiffener layout optimization for three-dimensional box structures with maximization of natural frequencies	Tiannan Hu
	by Hu, T., Ding, X., Zhang, H. and Shen, L.	
103	Motion characteristics of biological propulsion systems for underwater vehicles in starting process	Xiaowen Shang
	by Shang, X., Wang, Y. and Yang, S.	
258	Maximum thickness control in heuristic based structural optimization	Wael Mars
	by Mars, W., Vietor, T., Fiebig, S. and Franke, T.	
304	A new method for faster identification of segmented fea- sible regions in constraint optimization problems	Koushyar Komeilizadeh
	by Komeilizadeh, K. and Duddeck, F.	
407	A FORTRAN formulation for efficient topology opti- mization of structures in ANSYS	Guillermo Reales Gutiérrez
	by Reales, G., van Keulen, F., Goosen, J. and Bornheim, A.	
421	Bionic design and optimization of aircraft spoiler stiff- ened layout	Ruotong Jiao
	by Shenyan, C., Ruotong, J., Tianyin, Z. and Siyuan, D.	

Moving morphable component methods - I

Day: Tuesday - June 15, 2021 Time: 9:00 AM - 9:50 AM MDT

Room: C

Chair and co-Chair: Weisheng Zhang and Peter Dunning

ID	Title	Presenter
131	Explicit topology optimization considering transient structural dynamic responses using the moving morphable component (MMC) approach	Jialin Li
	by Li, J., Zhang, Y., Zhang, W. and Guo, X.	
221	Combined model-based stiffened plate structure topology optimization via MMC approach	Linyuan Li
	by Linyuan, L.	
367	Explicit Topology Optimization of Topological Insulators	Jiachen Luo
	by Luo, J., Du, Z. and Guo, X.	
392	Implementing Bezier Curves and Commercial Solvers in the Moving Morphable Components Framework	Thomas Shannon
	by Shannon, T., Robinson, T., Murphy, A. and Armstrong, C.	
490	Moving Stretchable Bars (MSB) method with chain constraints for topology optimization of deployable structures	Dongsheng Jia
	by Jia, D., Bontoft, E., Zhang, Y., Zhu, J., Zhang, W. and Toropov, V.	
566	Additive Manufacturing-Oriented Graded Lattice Structure Design Based on MMC Method and Partition Coordinate Perturbation Technology	Xu Guo
	by Guo, X., Liu, C. and Xu, W.	

Design optimization with applications to aerospace problems - III

Day: Tuesday - June 15, 2021

Time: 9:00 AM - 9:50 AM MDT

Room: D

Chair and co-Chair: Graeme Kennedy and Vassili Toropov

ID	Title	Presenter
55	Efficient Fail-safe Topology Optimization using the Geometry Projection Method	Hollis Smith
	by Smith, H., Norato, J., Deaton, J. and Kolonay, R.	
162	Topology optimization of compliant mechanisms for designing reliable Lunar surface hardware.	Dorota Budzyń
	by Budzyń, D., Cammarano, A. and Cowley, A.	
326	Efficient Aircraft Rib Design through Multi-scale Topology Optimisation	Edouard Duriez
	by Duriez, E., Morlier, J., Charlotte, M. and Azzaro-Pantel, C.	
358	Topology optimization of large-scale 3D morphing wing structures	Peter Dørffler Lade- gaard Jensen
	by Jensen, P. D. L., Wang, F., Dimino, I. and Sigmund, O.	
543	The topology-size integrated optimization design for an aircraft wing structure	Hai Huang
	by Huang, H. and Fu, J.	

Design optimization for advanced manufacturing - III

Day: Tuesday - June 15, 2021 Time: 9:00 AM - 9:50 AM MDT

Room: E

Chair and co-Chair: Lise Noel and James Guest

ID	Title	Presenter
163	Dripping Effect and Overhang Constraint in Topology Optimization for Additive Manufacturing	Alain Garaigordobil
	by Ansola, R., Borinaga, R. and Veguería, E.	
265	Concurrent shape optimization of the part and scanning- path for additive manufacturing	Mathilde Boissier
	by Boissier, M.	
303	Topology optimization in OpenFOAM: how to define the maximum inverse porosity to consider manufacturing constraint	Pablo Ignacio Alarcón Soto
	by Alarcón Soto, P. I. and Duysinx, P.	
459	Development of a coupled topology optimization method for injection-molded short fiber-reinforced polymer-metal hybrid composites	Berenalp Enguerel
	by Enguerel, B. and Albers, A.	
531	Topology Optimization under Constant Feature Thickness Constraint for Wire Based Additive Manufacturing	Julia Carroll
	by Carroll, J. D. and Guest, J. K.	

Socializing - 4

Day: Tuesday - June 15, 2021

Time: 10:00 AM - 11:00 AM MDT

Room: Lounge

Event Organizer

In Memoriam of Raphael "Rafi" T. Haftka (Coffee Break Nam-Ho Kim

Room)

Tuesday - June 15, 2021

Evening Sessions -6:00 - 10:00 PM MDT

Plenary - 2

Day: Tuesday - June 15, 2021 Time: 6:00 PM - 6:50 PM MDT

Room: Auditorium Chair: Alicia Kim

Title Presenter

Autonomous Optimization and Control of Energy Systems Andrey Bernstein

Evolutionary and zero-order methods for structural optimization - II

Day: Tuesday - June 15, 2021 Time: 7:00 PM - 7:50 PM MDT

Room: A

Chair and co-Chair: Xiaodong Huang and Amir H Gandomi

ID	Title	Presenter
129	History of Evolutionary Structural Optimization (ESO) and Bidirectional ESO	Grant Steven
	by Steven, G.	
229	Topology Optimization of Cellular Structures with HCA	Jiao Jia
	by Jia, J., Yin, S., Xu, J., Da, D. and Hu, J.	
295	Auto Plot PATHFINDER: Can multi-purpose optimiza- tion generate a plant layout comparable to a veteran en- gineer?	Kenji Mori
	by Mori, K., Yamada, Y., Sakiyama, H., Miyashita, T., Sato, T. and Arakawa, M.	
352	Geometry Optimization of a Rubber Mount Using Cuckoo Search Algorithm Considering Hyperelasticity and Viscoelasticity	Chih-Hsing Liu
	by Liu, C., Hsu, Y. and Yang, S.	
483	Exploring Quasi-Optimum Solution Assuming Side Constraints from Approximation Active Constraints	Hiroshi Unesaki
	by Unesaki, H., Osumi, Y., Hiramatsu, S., Kondo, S., Hatano, T., Arakawa, M. and Butsuen, T.	
568	The hybrid cellular automaton with adaptive controllers	Sajjad Raeisi
	by Raeisi, S., Arcos-Legarda, J. and Tovar, A.	

Topology optimization for fluids - II

Day: Tuesday - June 15, 2021 Time: 7:00 PM - 7:50 PM MDT

Room: B

Chair and co-Chair: Emilio Carlos Nelli Silva and Yongbo Deng

ID	Title	Presenter	
51	On the topology optimization of fluid-structure interac- tion problems with binary design variables	Anderson Azevêdo	S.C.
	by Azevêdo, A. S. d. C., Ranjbarzadeh, S., Gioria, R. d. S., Silva, E. C. N. and Picelli, R.		
171	Topology optimization of fluid-structure interaction problems with turbulence models	Renato Picelli	
	by Picelli, R., Ranjbarzadeh, S., Sivapuram, R., Gioria, R. d. S. and Silva, E. C. N.		
277	Topology optimization for Navier-Stokes flow under the projected area constraint	Kozo Furuta	
	by Morishita, N., Nishiwaki, S., Izui, K., Furuta, K. and Kondoh, T.		
446	Structural optimization of transient trajectory of particle	Gil Ho Yoon	
	by Yoon, G. H.		
552	A Hyperelasticity-Based Mesh Deformation Technique for Topology Optimization of Fluid-Structure Interaction Problems	Mohamed hamid	Abdel-
	by Abdelhamid, M. and Czekanski, A.		

Design optimization of heat exchangers and other thermo-fluid applications - $\Pi\Pi$

Day: Tuesday - June 15, 2021 Time: 7:00 PM - 7:50 PM MDT

Room:

Chair and co-Chair: Alicia Kim and Ming Zhou

ID	Title	Presenter
16	Intelligent Design Methods for Structure Layout Opti- mization Based on Deep Learning	Qiyin Lin
	by Lin, Q. and Hong, J.	
255	Topology Optimization for Transient Heat Transfer considering Size Effect of Microstructure in Porous Material	Naruethep Sukulthanasorn
	by Sukulthanasorn, N., Hoshiba, H., Kurumatani, M., Kato, J. and Terada, K.	
289	Conformal Topology Optimization of Heat Conduction Problems on Manifolds using Dimension Reduction Level-set Methods (DR-LSM)	Xiaoqiang Xu
	by Xu, X., Gu, X. D. and Chen, S.	
472	A novel design method of heat sink with conjugate heat transfer by geometry modeling and shape optimization	Xiwei Tian
	by Tian, X., Wang, W., Qian, S. and Sun, C.	
546	Multi-Scale and Multi-Physics Analysis, Approximation- Assisted Optimization, and Experimental Validation of Compact Heat Exchangers utilizing High-Performance, Non-Round Tubes	James Tancabel
	by James, T. and Vikrant, A.	

Moving morphable component methods - II

Day: Tuesday - June 15, 2021 Time: 8:00 PM - 8:50 PM MDT

Room: A

Chair and co-Chair: Nozomu Kogiso and Xu Guo

ID	Title	Presenter
35	Fully adaptive isogeometric topology optimization using MMC based on truncated hierarchical B-splines	Aodi Yang
	by Yang, A., Wang, S. and Xie, X.	
224	Explicit topology optimization via growth evolution of moving morphable component (MMC)	Tianchen Cui
	by Cui, T.	
243	Explicit structural topology optimization using BEM-based MMV approach	Weisheng Zhang
	by Zhang, W., Youn, S. and Guo, X.	
275	Topology Optimization with B-Spline Offset Features	Ying Zhou
	by Zhou, Y. and Zhang, W.	
310	Topology Optimization of Armor Layer in Marine Flex- ible Riser Based on Moving Morphable Components	Lifu Wang
	by Wang, L., Yang, Z., Yan, J., Shi, D., Mao, Y. and Fan, Z.	

Topology optimization for fluids - III

Day: Tuesday - June 15, 2021 Time: 8:00 PM - 8:50 PM MDT

Room: B

Chair and co-Chair: Gil Ho Yoon and Renato Picelli

ID	Title	Presenter
183	Topology optimization of stationary fluid-structure in- teraction problems including large displacements	Kamilla Silva
	by Silva, K. E. S., Sivapuram, R., Ranjbarzadeh, S., Gioria, R., Silva, E. C. N. and Sanches, R. P.	
188	Topology optimization of turbulent fluid flow by using integer linear programming	Emilio Carlos Nelli Silva
	by Picelli, R., Souza, E. M. d., Ranjbarzadeh, S., Gioria, R. d. S. and Silva, E. C. N.	
362	Topology optimization for surface flows	Yongbo Deng
	by Deng, Y., Zhang, W., Liu, Z., Zhu, J., Bai, J. and Korvink, J. G.	
387	Data-driven Multifidelity Topology Design Using Varia- tional Autoencoder in Thermal-fluid Problems	Kentaro Yaji
	by Yaji, K., Yamasaki, S. and Fujita, K.	
393	Navier-Slip Boundary Effect on Flow Topology Optimization	Georg Pingen
	by Pingen, G., Maute, K. and Negrete, L.	

Design optimization of heat exchangers and other thermo-fluid applications - ${ m IV}$

Day: Tuesday - June 15, 2021 Time: 8:00 PM - 8:50 PM MDT

Room:

Chair and co-Chair: Boyan Lazarov and Ahmad Najafi

ID	Title	Presenter
364	Topology Optimization of Fischer Tropsch Reactors for Synthetic Fuel Production	Jorge Luis Barrera Cruz
	by Barrera Cruz, J. L., Hartvingsen, J. J. and Beck, V. A.	
391	Level-Set Topology Optimization of a Phase Change Cooled Airfoil Leading Edge for High Speed Applications	Nils Wunsch
	by Wunsch, N. and Maute, K.	
440	Multi-objective design optimization of perforated plate to improve the flow distribution in the heat exchanger	Kohei Miyamoto
	by Miyamoto, K., Kitayama, S., Izutsu, R., Tabuchi, S. and Yamada, S.	
506	Topology Optimization Design of Guide Plates for Cold Plate Flow Channel	Sihao Qian
	by Qian, S. and Wang, W.	

Socializing - 5

Day: Tuesday - June 15, 2021 Time: 9:00 PM - 10:00 PM MDT

Room: Lounge

Event	Organizer
Young Investigator Workshop I (Coffee Break Room)	John Evans

Wednesday - June 16, 2021

Morning Sessions -7:00 - 11:00 AM MDT

ISSMO General Assembly

Day: Wednesday - June 16, 2021 Time: 7:00 AM - 7:50 AM MDT

Room: Auditorium Chair: Wei Chen

Orgnanized by Professor Wei Chen, President, ISSMO

Isogeometric methods in design optimization

Day: Wednesday - June 16, 2021
Time: 8:00 AM - 8:50 AM MDT

Room: A

Chair and co-Chair: John Evans and Peter Dunning

ID	Title	Presenter
34	Adaptive isogeometric topology optimization in truncated hierarchical B-splines space	Xianda Xie
	by Xie, X., Wang, S. and Yang, A.	
203	Multiresolution Isogeometric Shape and Topology Opti- mization with Volumetric Subdivision Representation of Complex Geometry	Gang Xu
	by Xu, G.	
380	Topology Optimization using Hierarchically Refined Higher Order B-Spline Meshes	Mathias Schmidt
	by Schmidt, M., Noel, L., Doble, K., Evans, J. and Maute, K.	
515	Isogeometric shape design sensitivity analysis of hypere- lastic Cosserat rods with extensible directors in friction- less contact problems	Myung-Jin Choi
	by Choi, M., Sauer, R. A. and Klinkel, S.	
524	Isogeometric design and shape optimization of 3D beams and lattice structures at large deformations	Oliver Weeger
	by Weeger, O.	

Optimization of contact and interface problems

Day: Wednesday - June 16, 2021
Time: 8:00 AM - 8:50 AM MDT

Room: B

Chair and co-Chair: Mathias Wallin and Niclas Strömberg

ID	Title	Presenter
15	Optimization design for uniform contact stress distribu- tion in elastic contact problems	Yicong Zhou
	by Zhou, Y., Lin, Q., Hong, J. and Yang, N.	
181	Internal contact modeling for topology optimization	Gore Lukas Bluhm
	by Bluhm, G. L., Sigmund, O. and Poulios, K.	
270	Nonlinear Shape Optimization of Machine Elements in Contact	Filip Sjövall
	by Sjövall, F., Wallin, M., Tortorelli, D. A. and White, D. A.	
410	Many-component analysis and design optimization with contact interface conditions	Keenan Doble
	by Doble, K., Schmidt, M., Noel, L. and Maute, K.	
411	Phase Field Topology Optimization of Elasto-Plastic Structures in Contact	Andrzej Myśliński
	by Myśliński, A.	
445	Topology optimization of elastic contact problems with maximum contact pressure constraint	Jiajia Li
	by Li, J., Zhang, W. and Gao, T.	

Design optimization accounting for material nonlinear behavior - I

Day: Wednesday - June 16, 2021

Time: 8:00 AM - 8:50 AM MDT

Room: C

Chair and co-Chair: Julian Norato and Daniel Tortorelli

ID	Title	Presenter
127	Conceptual Crashworthiness Sheet Sizing	Claus B.W. Pedersen
	by Pedersen, C. B., Kulathu, S., Mulmule, S., Upadhyay, P. and Bose, K.	
192	Topology optimization of thermo-hyperelastic structures utilizing inverse motion based form finding	Qianqian Sui
	by Sui, Q., Yan, J., Fan, Z., Wallin, M., Ristinmaa, M. and Niu, B.	
276	Structural topology optimization for ductile failure and buckling resistance	Jonathan Russ
	by Russ, J.	
297	A Modular XFEM Approach Used For Elastoplastic Materials	Felix Wohlgemuth
	by Wohlgemuth, F.	

Design optimization for civil enginering and architectural design - I

Day: Wednesday - June 16, 2021

Time: 8:00 AM - 8:50 AM MDT

Room: D

Chair and co-Chair: Josephine Carstensen and Makoto Yamakawa

ID	Title	Presenter
96	Plate supports optimization using feature mapping approach	Yakov Zelickman
	by Zelickman, Y. and Amir, O.	
121	The efforts so far: Topology optimization in concrete construction	Nadine Stoiber
	by Stoiber, N. and Kromoser, B.	
134	A heuristic two-stage optimization of the system building gymnasiums according to the scale	Hayata Takahashi
	by Takahashi, H., Yamakawa, M., Iguchi, T., Tanahashi, T. and Nagasaka, K.	
156	Robust Design Optimization of Moment-Resisting Steel Frames using Displacement-Restraint Brace and Oil Damper	Sumio Kishida
	by Kishida, S., Yamakawa, M., Asakawa, T. and Nagano, Y.	
312	Topology optimization of a steel joint for temporary space frames using P-norm aggregated stress constraints	Daan Van Cauteren
	by Van Cauteren, D., Lombaert, G. and Schevenels, M.	

Design of composite structures - I

Day: Wednesday - June 16, 2021

Time: 8:00 AM - 8:50 AM MDT

Room: E

Chair and co-Chair: Grégoire Allaire and Sa-aadat Parker

ID	Title	Presenter
54	Simultaneous optimization of stiffener placement and skin material properties on a stiffened composite space launcher skirt	Florent Savine
	by Savine, F., Irisarri, F., Julien, C., Vincenti, A. and Guerin, Y.	
99	Challenges for dealing with composite winding profiles under lateral crash loads using the Graph and Heuristic based Topology Optimization	Dominik Schneider
	by Schneider, D., Schumacher, A., Huf, A., Donhauser, T. and Schmeer, S.	
213	A generalised isogeometric polar approach for optimising variable stiffness composites: application to eigenvalue buckling problems	Marco Montemurro
	by Fiordilino, G. A., Izzi, M. I. and Montemurro, M.	
353	Topological Optimisation of Large Additively Manufac- tured Composite Structures with a Graded Lattice Core	Alex Moss
	by Moss, A., Panesar, A., Macquart, T., Greaves, P., Forrest, M. and Pirrera, A.	
532	Topology optimization with anisotropic material properties considering buckling	Federico Ferrari
	by Ferrari, F. and Guest, J. K.	

Topology optimization for solid mechanics

Day: Wednesday - June 16, 2021
Time: 9:00 AM - 9:50 AM MDT

Room: A

Chair and co-Chair: Robert Dienemann and Gore Lukas Bluhm

ID	Title	Presenter
126	Coupled topology optimization of both structure and bolt connections	Lalaina Rako- tondrainibe
	by Rakotondrainibe, L., Allaire, G. and Orval, P.	
314	Topology optimization for stiffness and stability with nonlinear geometry	Peter Dunning
	by Dunning, P.	
331	Topology optimization for pressure loading problems under buckling constraints using the TOBS method	Eduardo Mendes
	by Mendes, E., Sivapuram, R., Rodríguez, R., Sampaio, M. and Picelli, R.	
334	Towards intentional aesthetics in topology optimization by applying the principle of unity-in-variety	Shannon Loos
	by Loos, S., Wolk, S. V. D., Graaf, N. d. and Wu, J.	
336	Analytical relationships for defining minimum length scales in the robust topology optimization framework based on uniform manufacturing uncertainties.	Denis Trillet
	by Denis, T., Pierre, D. and Eduardo, F.	
496	Topology optimization with wall thickness and developability constraints for foldable, shape-changing structures	Yuqing Zhou
	by Zhou, Y., Nomura, T., Dede, E. M. and Saitou, K.	

Design optimization accounting for material nonlinear behavior - II

Day: Wednesday - June 16, 2021

Time: 9:00 AM - 9:50 AM MDT

Room: B

Chair and co-Chair: Claus B.W. Pedersen and Myung-Jin Choi

ID	Title	Presenter
20	Plastic Work Constrained Topology Optimization	Mathias Wallin
	by Wallin, M., Ivarsson, N., Amir, O. and Tortorelli, D. A.	
285	Conformal Topology Optimization of Multi-material Ferromagnetic Soft Actuators	Jiawei Tian
	by Tian, J. and Chen, S.	
299	Sensitivity analysis for elasto-plastic materials with a non-local damage regularisation	Fabian Guhr
	by Guhr, F. and Barthold, F.	
317	Gradient based shape optimization of the X0-specimen	Jan Liedmann
	by Liedmann, J., Gerke, S., Barthold, F. and Brünig, M.	
319	An Interface-enriched Level Set-based Topology Opti- mization for Tailoring Fracture Toughness	Jian Zhang
	by Zhang, J., Keulen, F. v. and Aragón, A. M.	

Design optimization for civil enginering and architectural design - II

Day: Wednesday - June 16, 2021
Time: 9:00 AM - 9:50 AM MDT

Room: C

Chair and co-Chair: Oded Amir and Josephine Carstensen

ID	Title	Presenter
24	Topology optimization of nonlinear viscous dampers for energy-dissipating structures subjected to random seis- mic excitations	Cheng Su
	by Su, C. and Xian, J.	
311	Complex structural optimization method involving cross- sectional size and material elastic modulus variables with the approximate concepts	Jiayi Fu
	by Jiayi, F. and Hai, H.	
346	Structural Optimisation of Diffusion Driven Degrada- tion Processes	Navina Waschinsky
	by Waschinsky, N., Barthold, F. and Menzel, A.	
401	Circular Arch Optimization by Numerical and Dimensionless Approaches	Amedeo Manuello
	by Manuello, A. and Marano, G. C.	
544	Application of structural design and topology optimiza- tion in architecture	Junho Chun
	by Chun, J.	

Design of composite structures - II

Day: Wednesday - June 16, 2021

Time: 9:00 AM - 9:50 AM MDT

Room: D

Chair and co-Chair: Axel Schumacher and Federico Ferrari

ID	Title	Presenter
236	Coupled optimization of topology and orientation of lo- cally anisotropic materials	Abdelhak Touiti
	by Touiti, A., Allaire, G. and Jouve, F.	
305	Failure load maximisation of variable-stiffness composites with mass and manufacturability constraints	Michele Iacopo Izzi
	by Izzi, M. I., Catapano, A. and Montemurro, M.	
378	Optimization of fiber-reinforced bead patterns using an evolutionary algorithm	Patrick Haberkern
	by Ott, M., Volk, W. and Albers, A.	
470	The Tsai-Wu failure index as an objective in composite structural optimization	Sa-aadat Parker
	by Parker, S. and Groenwold, A.	
529	Optimal design of VTOL -UAV using PLA reinforced with carbone fibres	Hao Yue
	by Bassir, D., Yue, H., Abouzaid, K. and Majak, J.	

Novel topology optimization techniques - I

Day: Wednesday - June 16, 2021
Time: 9:00 AM - 9:50 AM MDT

Room: E

Chair and co-Chair: Pierre Duysinx and Christian Frier Hvejsel

ID	Title	Presenter
98	A new approach to topological ligaments in structural optimization	Charles Dapogny
	by Dapogny, C.	
113	A diversity metric based on Gaussian process model for diverse and competitive design	Zheng Li
	by Li, Z.	
144	A new approach based on spectral graph theory to avoid- ing enclosed voids in topology optimization	Alberto Donoso
	by Aranda, E. and Ruiz, D.	
170	Influence of different modeling for outer contour and in- ner zones in topology optimization	Jan Holoch
	by Albers, A.	

Socializing - 6

Day: Wednesday - June 16, 2021 Time: 10:00 AM - 11:00 AM MDT

Room: Lounge

Event	Organizer
Young Investigator Workshop II (Coffee Break Room)	John Evans

Wednesday - June 16, 2021

Evening Sessions -6:00 - 10:00 PM MDT

Design of composite structures - III

Day: Wednesday - June 16, 2021
Time: 6:00 PM - 6:50 PM MDT

Room: A

Chair and co-Chair: Renato Picelli and Zunyi Duan

ID	Title	Presenter
39	A Full-scale Topology Optimization Method for Fiber- reinforced Composite Structures with Continuous Fiber Paths	Hang Li
	by Li, H., Li, H. and Gao, L.	
117	Material orientation optimization of laminated shell structure for frequency response problem	Ryosuke Tsukihara
	by Tsukihara, R. and Shimoda, M.	
119	Stiffness-based concurrent design of fiber composite based on the novel discrete-continuous material orientation optimization model	Haoqing Ding
	by Ding, H. and Xu, B.	
186	Fiber Reinforced Additive Manufacturing: Implementa- tion in Optimization of Structural Components	Noah Ray
	by Ray, N. and Kim, I. Y.	
381	A heuristic method for practical FEA-based optimization of wind turbine blade core distributions	Austin Herrema
	by Herrema, A., Rotondo, M. and Mullings, J.	

Novel topology optimization techniques - II

Day: Wednesday - June 16, 2021
Time: 6:00 PM - 6:50 PM MDT

Room: B

Chair and co-Chair: Jianbin Du and Jaeyub Hyun

ID	Title	Presenter
101	A new method for integrated topology and packaging op- timization	Stephen Roper
	by Roper, S. W. K. and Kim, I. Y.	
130	3D Manufacturable Design using Element-based Topology Optimization	Tuan Tran
	by Tran, T. and Huang, X.	
139	Introducing Design Space-Independence in Beam Cross- Section Optimization	Chander Sen
	by Sen, C. and Prasad, J.	
225	The number of genus Constraint in 3D Structural Topology Optimization	Haitao Han
	by Han, H., Wang, C. and Liu, Z.	
553	Revisiting element removal strategies in topology optimization and the role of Heaviside Projection in material reintroduction	James Guest
	by Behrou, R., Lotfi, R., Carstensen, J., Ferrari, F. and Guest, J.	

Machine learning for design optimization - III

Day: Wednesday - June 16, 2021
Time: 6:00 PM - 6:50 PM MDT

Room: C

Chair and co-Chair: Wei Chen and Kazuki Hayashi

ID	Title	Presenter
71	Acceleration design for continuum topology optimization Based on ICM method and data-driven	Hongling Ye
	by Ye, H., Li, J., Wei, N. and Sui, Y.	
89	Accelerated projected gradient method for compliance minimization problem	Akatsuki Nishioka
	by Kanno, Y.	
420	Towards accelerating topology optimization via machine learning	Yi Xing
	by Xing, Y. and Tong, L.	
474	Iterative Sizing Optimization of Aircraft Wings Using Analytical Neural Networks	Masakazu Kobayashi
	by Kobayashi, M. and Ogawa, Y.	
492	Dynamic Robotic Grasping Optimization Based On Deep Q-Network	Jianhao Fang
	by Fang, J., Hu, W., Wang, C., Liu, Z. and Tan, J.	

Design optimization for advanced manufacturing - IV

Day: Wednesday - June 16, 2021
Time: 6:00 PM - 6:50 PM MDT

Room: D

Chair and co-Chair: Mingdong Zhou and Yoon Young Kim

ID	Title	Presenter
83	PDE for the geometrical constraint of additive manufacturing and its application to topology optimization	Takayuki Yamada
	by Yamada, T.	
248	Concurrent Optimization of Building Orientation and Infill-Struts for Lattice Structures in Additive Manufac- turing	Chenyang Li
	by Li, C., Zhu, J., Yuan, S. and Zhang, W.	
542	Topology Optimization for Design with Stress-dependent Material Properties	Justin Unger
	by Unger, J., Gaynor, A., Vaughn, M., McWilliams, B., Hemker, K. and Guest, J.	

Design of composite structures - IV

Day: Wednesday - June 16, 2021
Time: 7:00 PM - 7:50 PM MDT

Room: A

Chair and co-Chair: Ming Zhou and Bin Niu

ID	Title	Presenter
19	Optimization of fiber orientation for composite lami- nates based on artificial neural networks	Yanan Xu
	by Xu, Y., Gao, Y., Wu, C., Fang, J., Steven, G. P. and Li, Q.	
184	A Topology Optimization approach for Design of Actively-cooled Vascular Composite	Reza Pejman
	by Pejman, R., Sigmund, O. and Najafi, A. R.	
341	Design of composite structures with programmable elas- tic responses under finite deformations	Weichen Li
	by Li, W., Wang, F., Sigmund, O. and Zhang, X. S.	
382	Multiobjective Stacking Sequence Optimization for Un- symmetrical Laminated Plate with Ply Drop-off under Several Empirical Constraints	Nozomu Kogiso
	by Kogiso, N. and Hashiwaki, K.	
396	Design Of Fiber Path And Shape For Variable-stiffness Panels Via Isogeometric Analysis	Yu Wang
	by Wang, Y. and Hao, P.	

Novel topology optimization techniques - III

Day: Wednesday - June 16, 2021
Time: 7:00 PM - 7:50 PM MDT

Room: B

Chair and co-Chair: Xiaodong Huang and Gengdong Cheng

ID	Title	Presenter
145	An ODE-govern Density Method with Level-set Description for Topology Optimization	Yang Liu
	by Liu, Y. and Du, J.	
262	Combined topology and spatial layout optimization for modularly constructed structures	Kristie Higginson
	by Higginson, K. and van Keulen, F.	
460	Development of joint distance constraint for optimal topology and optimal connection for multiple components	Jun Hwan Kim
	by Kim, J. H. and Yoon, G. H.	
558	Topology Optimization of Structures with Programmable Snapping Instabilities	Tuo Zhao
	by Zhao, T. and Paulino, G. H.	

Machine learning for design optimization - IV

Day: Wednesday - June 16, 2021
Time: 7:00 PM - 7:50 PM MDT

Room: C

Chair and co-Chair: X. Shelly Zhang and Daicong Da

ID	Title	Presenter
153	A data-driven self-adaptive SSI-PSO for the multi-scale lightweight design of the CFRP automotive parts	Han Li
	by Li, H., Liu, Z. and Zhu, P.	
159	$Machine\ learning\ and\ graph\ embedding\ for\ truss\ topology$ $optimization$	Makoto Ohsaki
	by Ohsaki, M., Hayashi, K. and Sakaguchi, K.	
414	Universal Machine Learning for Topology Optimization: Multiscale Adaptive Online Learning on Unstructured Discretizations	Heng Chi
	by Zhang, Y., Senhora, F. V. D., Tang, T. L. E., Mirabella, L. and Paulino, G.	
443	System reliability analysis using predictive system uncertainty	Seonghyeok Yang
	by Yang, S. and Lee, I.	
564	Efficient shape update in topology optimization using physics-informed neural networks	Atsuto Hashimoto
	by Hashimoto, A., Furuta, K., Izui, K. and Nishiwaki, S.	

Design optimization for advanced manufacturing - V

Day: Wednesday - June 16, 2021
Time: 7:00 PM - 7:50 PM MDT

Room: D

Chair and co-Chair: Daniel Milbrath De Leon and Yoshihiro Kanno

ID	Title	Presenter
81	Optimization-based Design for Additive Manufacturing	Joshua Robbins
	by Robbins, J., Aguilo, M., Clark, B., Johnson, K. and Viertel, R.	
214	Additive manufacturing topology optimization for buckling with stiffness constraint	Junji Kato
	by Kato, J., Mizutori, T., Hoshiba, H., Uozumi, H. and Kikawa, K.	
283	Topology Optimization Method with Overhang Con- straint for Selective Laser Melting	Yu Wang
	by Wang, Y.	
433	Topology optimization subject to overhang angle constraint with overhang length relaxation in AM	Kaiqing Zhang
	by Zhang, K. and Cheng, G.	
562	Discrete Object Projection using Alternate Strategies to Prevent Phase Mixing	Chuan Luo
	by Luo, C., Lee, H. Y. and Guest, J. K.	

Design of composite structures - \mathbf{V}

Day: Wednesday - June 16, 2021 Time: 8:00 PM - 8:50 PM MDT

Room: A

Chair and co-Chair: Ahmad Najafi and Julian Norato

ID	Title	Presenter
23	Optimizing composite structures with curvilinear fibers through a parametric divergence-free vector field method	Ye Tian
	by Tian, Y., Pu, S., Shi, T. and Xia, Q.	
325	Concurrent Multi-phase and Multi-scale Design Opti- mization of Fiber-reinforced Variable Stiffness Compos- ite Structures	Zunyi Duan
	by Duan, Z., Zhu, J., Xu, B. and Yan, J.	
338	Fiber-reinforced hyperelastic structures under large de- formations	X. Shelly Zhang
	by Zhang, X. S., Chi, H. and Zhao, Z.	
422	Comprehensive Optimization of Composite Laminate Stacking Sequence and Shape with Two-Level Approxi- mation Method	Xinrong Liu
	by Chen, S., Liu, X., Yang, Z. and Huang, H.	
499	Optimizing Reinforcement Architecture of Plain-woven Textile Composites for Tailored Stiffness and Thermal Conductivity	Xiaoyi Zhou
	by Zhou, X.	

Novel topology optimization techniques - IV

Day: Wednesday - June 16, 2021
Time: 8:00 PM - 8:50 PM MDT

Room: B

Chair and co-Chair: James Guest and Grant Steven

ID	Title	Presenter
222	Adaptive mesh refinement in density-based topology optimization	Boyan Lazarov
	by Lazarov, B.	
274	Generative Adversarial Networks for Multiphysics Topology Design	Corey Parrott
	by Parrott, C. M. and James, K. A.	
281	Structural topology optimization using the body-fitted mesh	Zicheng Zhuang
	by Zhuang, Z., Xie, Y. M. and Zhou, S.	
435	IGA/FCM-based Adaptive Bubble Method for Simultaneous Shape and Topology Optimization of Shell Structures	Hualin Zhang
	by Cai, S., Zhang, H. and Zhang, L.	
437	Structural complexity control in discrete variable continuum topology optimization	Yuan Liang
	by Liang, Y., Yan, X. and Cheng, G.	
541	Topology Optimization for thermal response time based on linear eigenvalues	Jaeyub Hyun
	by Hyun, J. and Kim, H. A.	

Machine learning for design optimization - V

Day: Wednesday - June 16, 2021
Time: 8:00 PM - 8:50 PM MDT

Room: C

Chair and co-Chair: Hongyi Xu and Xu Guo

ID	Title	Presenter
267	Machine-learning Based Multi-fidelity Surrogate Modeling Methods	Chao Zhang
	by Zhang, C., Liu, L., Xu, Y., Song, X. and Lv, L.	
366	An Innovative Design Method of Tire Tread Patterns by Deep Generative Model and Elitist Multi-Objective Search	Kazuki Imamura
	by Imamra, K., Nishimura, R., Yamasaki, S., Yaji, K. and Fujita, K.	
448	Efficient tire pattern design using deep learning method- ology	Mingyu Lee
	by Lee, M., Park, Y., Jo, H., Kim, K., Lee, S. and Lee, I.	
573	Generating airfoil with specific lift coefficients using conditional GAN and conditional VAE	Kazuo Yonekura
	by Yonekura, K., Miyamoto, N. and Suzuki, K.	

Design optimization for advanced manufacturing - VI

Day: Wednesday - June 16, 2021
Time: 8:00 PM - 8:50 PM MDT

Room: D

Chair and co-Chair: Daniel Tortorelli and John Evans

ID	Title	Presenter
155	Concurrent Topology Optimization of Shells and Self- supporting Infills for additive manufacturing	Yufan Lu
	by Lu, Y., Liu, Y. and Zhou, M.	
351	Topology Optimization of Supports and Infills for Additive Manufacturing with Process Simulations and Geometric Constraints	Mingdong Zhou
	by Zhou, M., Liu, Y., Wei, C. and Lu, Y.	
441	Multi-objective design optimization of process parameters in cold forging minimizing risk of material damage	Satoshi Kitayama
	by Kitayama, S., Kadoya, S., Takano, M. and Kobayashi, A.	
567	Topology Optimization for Fused Filament Fabrication with Weak Deposition Bonds	Jackson Jewett
	by Jewett, J.	

Socializing - 7

Day: Wednesday - June 16, 2021 Time: 9:00 PM - 10:00 PM MDT

Room: Lounge

Event Organizer

Roundtable: Software design, development and management Miguel Aguilo

practices (Coffee Break Room)

Thursday - June 17, 2021

Morning Sessions -7:00 - 11:00 AM MDT

Multi-objective topology optimization

Day: Thursday - June 17, 2021

Time: 7:00 AM - 7:50 AM MDT

Room: A

Chair and co-Chair: Nozomu Kogiso and Palaniappan Ramu		
ID	Title	Presenter
36	Multi-Objective Optimization under Uncertainty of Process Parameters in Additive Manufacturing	Berkcan Kapusuzoglu
	by Kapusuzoglu, B., Nath, P., Sato, M., Mahadevan, S. and Witherell, P.	
107	Exploration of Pareto Front for Multi-objective Topology Optimization Problem Incorporating an Adaptive Weight and a Configuration-based Clustering Scheme	Seungjae Min
	by Ryu, N. and Min, S.	
245	Multi-objective optimization of gear ratio and shifting patterns in multi-speed transmission electric vehicles us- ing transmission efficiency map	Junhyeong Jo
	by Jo, J., Kwon, K. and Min, S.	
457	Six-objective optimization of electrothermal microactua- tors by means of Game Theory and Artificial Immune System	Adam Dugosz
	by Dugosz, A., Jarosz, P. and Schlieter, T.	
575	$Cooperative \ framework \ for \ many-objective \ crash \ optimization$	Nidhi Nivesh Dom- maraju
	by Dommaraju, N., Bujny, M., Menzel, S., Olhofer, M. and Duddeck, F.	

Level set methods

Day: Thursday - June 17, 2021
Time: 7:00 AM - 7:50 AM MDT

Room: B

Chair and co-Chair: Shinji Nishiwaki and Charles Dapogny

ID	Title	Presenter
172	An overview on the Interface-enriched Generalized Finite Element Method (IGFEM) for level set-based topology optimization	Alejandro Aragón
	by Aragón, A. M., van den Boom, S., Zhang, J. and van Keulen, F.	
228	3D multi-material topology optimization with B-spline parameterized level set method	Junpeng Zhao
	by Zhao, J., Zhao, R. and Wang, C.	
231	A Level set band method for level set-based topology op- timization methods	Peng Wei
	by Jiang, Z. and Wei, P.	
261	A CAD Aware Meshfree Topology Optimization Framework using Moments	Sandilya Kambampati
	by Kambampati, S., Taber, A., Kumar, G., Shapiro, V. and Kim, H. A.	
333	Explicit Level Set Topology Optimisation Method for Multidisciplinary Applications	Elliot Bontoft
	by Bontoft, E. K., Zhang, Y., Dubrovka, R. and Toropov, V.	
419	Shape and Material Optimization of Problems with Dynamically Evolving Interfaces	Kurt Maute
	by Maute, K., De, S. and Doostan, A.	
453	Level Set-based Topology Optimization for Maximizing Linear Buckling Load	Ishida Naoyuki
	by Ishida, N., Kondoh, T., Furuta, K., Izui, K. and Nishiwaki, S.	

Design optimization of acoustic materials and devices - I

Day: Thursday - June 17, 2021
Time: 7:00 AM - 7:50 AM MDT

Room: C

Chair and co-Chair: Eddie Wadbro and Fred van Keulen

ID	Title	Presenter
110	Transient vibroacoustic structural optimization for tailored broadband characteristics	Niels Aage
	by Aage, N. and Dilgen, C. B.	
150	Vibroacoustic shape optimization	Peter Risby Andersen
	by Andersen, P. R., Nielsen, D. G., Henríquez, V. C., Aage, N. and Kook, J.	
152	Topology optimization for two-layered acoustic metasur- faces based on a two-scale homogenization method	Yuki Noguchi
	by Noguchi, Y. and Yamada, T.	
300	Research on topology optimization of acoustic-structural coupling system under explicit framework	Lei Xu
	by Xu, L., Zhang, W. and Guo, X.	
347	Topology Optimization of an Acoustic Diode?	Seyedabbas Mousavi
	by Bokhari, A. H., Mousavi, A., Niu, B. and Wadbro, E.	
405	Shape sensitivity analysis for embedding methods without domain transformations: application to acoustics	Martin Berggren
	by Berggren, M.	
574	A level-set approach for multiple materials based on reaction-diffusion equation applied to inversion problems in acoustic wave propagation	Paulo Bastos de Castro
	by Castro, P. B. d., Silva, E. C. N. and Fancello, E. A.	

Shape optimization - I

Day: Thursday - June 17, 2021

Time: 7:00 AM - 7:50 AM MDT

Room: D

Chair and co-Chair: Kai-Uwe Bletzinger and Pierre Duysinx

ID	Title	Presenter
70	Shape optimization of auxetic bending-active gridshells with non-uniform reentrant patterns	Yusuke Sakai
	by Sakai, Y. and Ohsaki, M.	
97	Eulerian Shape Optimization by Density Advection	Ronald Bartz
	by Bartz, R., Franke, T., Fiebig, S. and Vietor, T.	
160	Optimal Strength Of Shaft-hub Assembly	Niels Leergaard Pedersen
	by Pedersen, N. L.	
227	Multidisciplinary design optimization of the shape and structure of Blended-wing-body Underwater Glider	Chongbo Fu
	by Fu, C., Wang, P., Dong, H. and Zhang, Y.	
315	A shape optimization approach towards scalable algorithms allowing large deformations	Jose Alfonso Pinzon Escobar
	by Onyshkevych, S., Escobar, J. A. P. and Siebenborn, M.	
491	Quasi-Newton Relaxed Gradient Projection method in large constrained node-based shape optimization problems	Ihar Antonau
	by Antonau, I., Hojjat, M. and Bletzinger, K.	

Design optimization considering eigenfrequency and dynamics - I

Day: Thursday - June 17, 2021

Time: 7:00 AM - 7:50 AM MDT

Room: E

Chair and co-Chair: Mattias Schevenels and Jüri Majak

ID	Title	Presenter
29	Material Nonlinear Numerical Method of Dynamic Topology Optimization on Equivalent Static Loads Method	Yongxin Li
	by Li, Y. and He, X.	
41	Topology optimization of eigenvalue problems	Anna Dalklint
	by Dalklint, A., Wallin, M. and Tortorelli, D.	
147	Nonlinear dynamic response optimization using Difference based Equivalent Static Loads combined with adaptive time selection	Jens Triller
	by Triller, J., Immel, R. and Harzheim, L.	
321	Damper placement optimization for truss structure vibration control	Ziqi Dai
	by Dai, Z., Chen, S. and Huang, H.	
510	Sensitivity analysis of a floating frame of reference approach to flexible multibody systems: Application to the design optimization of a Tyrolean weir cleaning mechanism	Veit Gufler
	by Gufler, V., Wehrle, E. and Vidoni, R.	
533	Investigation of Combining Vertex Morphing and Rigid Body Parametrization	David Schmölz
	by Schmölz, D., Geiser, A. and Bletzinger, K.	

Design optimization with applications to automotive problems - I

Day: Thursday - June 17, 2021
Time: 8:00 AM - 8:50 AM MDT

Room: A

Chair and co-Chair: Yuqing Zhou and Lise Noel

ID	Title	Presenter
74	About Tailor Rolled Blank parts in the multi-disciplinary optimization process of a vehicle	Niklas Klinke
	by Klinke, N., Kobelev, V. and Schumacher, A.	
75	Data-driven modeling of impact dynamics using spa- tiotemporal graph neural network	Ziming Wen
	by Wen, Z., Wang, H., Li, Y. and Peng, Y.	
76	LEOPARD/topo nonlinear topology optimization overview of the implemented methods and models	Sierk Fiebig
	by Fiebig, D. S., Franke, D. T. and Bartz, R.	
363	A Convex Optimization Framework for Minimum Lap Time Design and Control of Electric Race Cars	Olaf Borsboom
	by Borsboom, O., Fahdzyana, C. A., Hofman, T. and Salazar, M.	
462	Optimal Structural Design of Vehicle Wheels through Multi-Objective Optimization and Artificial Intelligence	Federico Ballo
	by Ballo, F., Gobbi, M. and Previati, G.	

Design of metamaterials - I

Day: Thursday - June 17, 2021
Time: 8:00 AM - 8:50 AM MDT

Room: B

Chair and co-Chair: Fabian Wein and Alejandro Aragón

ID	Title	Presenter
22	A Two-Variable Topology Optimization Approach for Simultaneously Macro Layout and Local Grading of Periodic Lattice Structures with Additive Manufacturing Constraints	Niclas Strömberg
	by Strömberg, N.	
216	Level-set Topology Optimization of Mechanoluminescent Materials	Hesaneh Kazemi
	by Kazemi, H., Zhao, J., Castro, D., Jeong, S. M., Bae, J. and Kim, H. A.	
272	Topology optimization of differentiable microstructures	Xiaoya Zhai
	by Zhai, X., Wang, W., Chen, F. and Wu, J.	
284	Microstructural topology optimization for patch-based sandwich panel with desired in-plane thermal expansion and structural	Zihao Yang
	by Yang, Z., Zhang, Y. and Liu, S.	
337	Systematic design and investigation of 3D hierarchical materials with enhanced buckling strength	Fengwen Wang
	by Wang, F.	

Surrogate modeling for design optimization - I

Day: Thursday - June 17, 2021
Time: 8:00 AM - 8:50 AM MDT

Room: C

Chair and co-Chair: Palaniappan Ramu and Xueguan Song

ID	Title	Presenter
18	Efficient high-dimensional Kriging modeling via the active subspace method	Liming Chen
	by Chen, L., Qiu, H. and Gao, L.	
42	Surrogate modeling for high-dimensional problems via image-driven manifold learning	Yu Li
	by Li, Y.	
90	An Iso-volumetric Weighting Approach to Increase Effi- ciency of Stratified Samplings	Arne Kaps
	by Kaps, A., Komeilizadeh, K. and Duddeck, F.	
256	Structural Optimization Using Bayesian Strategies with Compositional Kernel Search	Jens Winter
	by Winter, J., Vietor, T., Fiebig, S. and Franke, T.	
388	A Screening-based Gradient-enhanced Multi-fidelity Gaussian Process model for Black-box Function Approx- imation	Quan Lin
	by Lin, Q., Zhou, Q. and Hu, J.	

Shape optimization - II

Day: Thursday - June 17, 2021
Time: 8:00 AM - 8:50 AM MDT

Room: D

Chair and co-Chair: Emilio Carlos Nelli Silva and Mathias Wallin

ID	Title	Presenter
133	Shape optimization of SMA structures with respect to fatigue	Xiaojun Gu
	by Gu, X., Zhu, J., Zhang, W. and Moumni, Z.	
165	Nodal move limits for shape optimization of cladded gridshells	Willem Gythiel
	by Gythiel, W. and Schevenels, M.	
168	Variational shape sensitivity analysis of an elastoplastic material using IGA	Seyed Ali Ghasemi
	by Ghasemi, S. A., Liedmann, J. and Barthold, F.	
193	A NURBS-based Shape Optimization Design of Structures and Materials	Ahmad Najafi
	by Najafi, A. R.	
240	Shape optimization of aero-engines turbine disks based on mesh deformation method	Lei Huang
	by Huang, L. and Tian, K.	
522	Multi-body and Multi-physics Shape Optimization Using Vertex Morphing Method	Moustafa Alsayed Ahmad
	by Alsayed Ahmad, M., Hojjat, M. and Bletzinger, K.	

Design optimization considering eigenfrequency and dynamics - II

Day: Thursday - June 17, 2021

Time: 8:00 AM - 8:50 AM MDT

Room: E

Chair and co-Chair: Alberto Donoso and Suguang Dou

ID	Title	Presenter
164	Weakly and fully coupled level set-based topology optimization of flexible multibody systems	Ali Azari Nejat
	by Held, A. and Seifried, R.	
209	Topology Optimization for Improving Stability of a Rotating Thin Plate	Jialiang Sun
	by Sun, J., Tian, Q., Wang, F. and Hu, H.	
320	Sensitivity Analysis of Geometrically Exact Beam Formulation in the Local Frame	Juliano Todesco
	by Todesco, J. and Brüls, O.	
386	Topology optimization of vibrating thin-walled stiffened plate with damping layer	Bin Niu
	by Liu, H., Yan, J. and Leng, Y.	
461	Topology optimization for large-scale MIMO frequency response using reduced-order models	Arnoud Delissen
	by Delissen, A., Astudillo, R., van Keulen, F., van Gijzen, M. and Langelaar, M.	

Stress-constrained topology optimization - I

Day: Thursday - June 17, 2021 Time: 9:00 AM - 9:50 AM MDT

Room: A

Chair and co-Chair: Oliver Giraldo-Londono and Matthijs Langelaar

ID	Title	Presenter
30	A Maximum Rectifier Function for Stress-Constrained Topology Optimization	Julián Norato
	by Norato, J., Smith, H., Deaton, J. and Kolonay, R.	
109	Stress-based topology optimization with precise and explicit geometric boundaries	Emad Shakour
	by Shakour, E. and Amir, O.	
372	Topology optimization with stress constraints and time- varying body forces	Alexander Held
	by Hermann, N. and Held, A.	
577	Stress constrained topology optimization	Gunnar Granlund
	by Granlund, G., Wallin, M. and Tortorelli, D. A.	

Design optimization with applications to automotive problems - II

Day: Thursday - June 17, 2021

Time: 9:00 AM - 9:50 AM MDT

Room: B

Chair and co-Chair: Sierk Fiebig and Yingchun Bai

ID	Title	Presenter
77	Using sensitivities in a heuristic nonlinear topology optimization	Thilo Franke
	by Franke, T., Fiebig, S. and Bartz, R.	
105	Heuristics based on expert knowledge for improving the topology of profile structures under axial crash loading in the scheme of the Graph and Heuristic based Topology Optimization	Johannes Sperber
	by Sperber, J., Ortmann, C., Schneider, D. and Schumacher, A.	
151	Optimization for Super Element Interior NVH Responses	Shaobin Liu
	by Liu, S., Mandal, D., Guan, J. and Pagaldipti, N.	
415	Truck door light weight designs using topology optimization	Pierre Duysinx
	by Duysinx, P., Weber, W., Remes, J., Stroobants, J., Bruijn, F. D., Heijster, J. P., Deckers, E., Lopez, C. and Eyckens, P.	
504	Uncertainty management framework for automotive crash simulations	Jonas Jehle
	by Jehle, J., Lange, V. and Gerdts, M.	

Shape optimization - III

Day: Thursday - June 17, 2021 Time: 9:00 AM - 9:50 AM MDT

Room: C

Chair and co-Chair: Niels Leergaard Pedersen and Niclas Strömberg

ID	Title	Presenter
166	Free vibration optimization of viscoelastic cantilever beams and plates	Antoni Joubert
	by Diani, J., Allaire, G. and Amstutz, S.	
241	Shape Optimization Method for Mutual Coupling Reduction of the MIMO Antenna-array	Yi Tang
	by Tang, Y., Gao, R., Deng, S. and Liu, S.	
330	Shape optimization of the forged automotive component with consideration of the unstable behavior	Przemysław Sebastjan
	by Sebastjan, P. and Ku, W.	
518	Node-Based Shape Optimization and Mechanical Test Validation of Complex Metal Components Manufactured by Laser Powder Bed Fusion.	Aditya Ghantasala
	by Diller, J., Geiser, A., Siebert, D., Oberhaidinger, F., Radlbeck, C., Mensinger, M., Wüchner, R. and Bletzinger, K.	
540	Status and potentials of free form shape optimization	Kai-Uwe Bletzinger
	by Bletzinger, K. and Zhou, M.	

Design optimization considering eigenfrequency and dynamics - III

Day: Thursday - June 17, 2021 Time: 9:00 AM - 9:50 AM MDT

Room: D

Chair and co-Chair: Jonathan Russ and Federico Ferrari

ID	Title	Presenter
178	Topology Optimization of Reduced Flexible Dynamical Systems with Unilateral Contacts	Timo Schmidt
	by Schmidt, T. and Seifried, R.	
215	Design of periodically stiffened panels for vibration con- trol using data-driven optimization	Meng-Xin He
	by He, M. and Ding, Q.	
263	Data-Driven Multiscale Design with Multiclass Mi- crostructures for Natural Frequency Maximization	Liwei Wang
	by Wang, L., Beek, A. v., Da, D., Chan, Y., Liu, Z., Zhu, P. and Chen, W.	
481	Orientational Design of 3D Anisotropic Materials	Jüri Majak
	by Majak, J., Bassir, D. and Mehrparvar, M.	
519	Topology optimization for the control of eigenfrequencies with applications to MEMS and vibro-acoustics	Daniele Giannini
	by Giannini, D., Aage, N., Braghin, F., Schevenels, M. and Reynders, E.	

Novel topology optimization techniques - V

Day: Thursday - June 17, 2021
Time: 9:00 AM - 9:50 AM MDT

Room: E

Chair and co-Chair: Charles Dapogny and Zheng Li

ID	Title	Presenter
112	Efficient approximate and exact reanalysis methods for the 0-1 topology modification	Xinyu Xie
	by Xie, X., Guo, G. and Zuo, W.	
114	Reduction of the multiple load optimum material design to the linear constrained problem	Tomasz Lewiński
	by Czarnecki, S. and Lewiński, T.	
157	Target reaction force design of continuum structures using topology optimization	Christian Frier Hve- jsel
	by Hvejsel, C. F.	
302	A Multi-Material Topology Optimization Method for the Resolution of Interfaces by means of the CISAMR- Algorithm	Robert Renz
	by Renz, R., Frank, N. and Albers, A.	
323	Investigating inexact iterative solvers in nested topology optimization	Oded Amir
	by Amir, O.	
329	Insights into numerical integration in feature mapping	Fabian Wein
	by Wein, F.	

Socializing - 8

Day: Thursday - June 17, 2021 Time: 10:00 AM - 11:00 AM MDT

Room: Lounge

Event	Organizer
ISSMO Women Networking II (Coffee Break Room)	X. Shelly Zhang

Thursday - June 17, 2021

Evening Sessions – 6:00 - 10:00 PM MDT

SOTA Talks - 1

Day: Thursday - June 17, 2021 Time: 6:00 PM - 6:50 PM MDT

Room: Auditorium

Chair: Samy Missoum

Title Presenter

Topology optimization: methodologies and applications Josephine Carstensen

From Surrogate Modeling to Physics-informed Neural Networks What Has Machine Learning Done for Engineering Analysis and Design?

Stress-constrained topology optimization - II

Day: Thursday - June 17, 2021 Time: 7:00 PM - 7:50 PM MDT

Room: A

Chair and co-Chair: Miguel Salazar de Troya and Daniel Milbrath De Leon

ID	Title	Presenter
28	$Stress-constrained\ topology\ optimization\ based\ on\ IGA-MFSE\ method$	Zhenzeng Lei
	by Lei, Z., Fang, M. and Yang, D.	
65	Stress-based structural optimization design under load position uncertainty	Minkyu Oh
	by Oh, M., Lee, D. and Yoo, J.	
198	Topology optimization design under stress and tempera- ture constraints	Qingxuan Meng
	by Meng, Q. and Xu, B.	
238	Stress-constrained topology optimization with inhomogeneous microstructure	Ruijie Zhao
	by Zhao, R., Zhao, J. and Wang, C.	
412	Topology optimization with local stress constraints using a unified failure criterion	Oliver Giraldo- Londoño
	by Giraldo-Londoño, O. and Paulino, G. H.	

Design optimization of acoustic materials and devices - II

Day: Thursday - June 17, 2021 Time: 7:00 PM - 7:50 PM MDT

Room: B

Chair and co-Chair: Boyan Lazarov and Jonathan Russ

ID	Title	Presenter
85	Acoustic hologram with phased arrays via topology optimization	Weibai Li
	by Li, W. and Huang, X.	
191	Customized inverse design of broadband acoustic meta- materials	Hao-Wen Dong
	by Dong, H., Zhao, S., Shen, C., Cummer, S. A., Zhang, C., Wang, Y., Cheng, L. and Fang, D.	
232	A robust topology optimisation for acoustic- elastodynamic coupled structures with broad working bandwidths	Jincheng Qin
	by Qin, J., Isakari, H., Takahashi, T. and Matsumoto, T.	
293	Multi-scale optimal design method of anisotropic acous- tic metamaterials based on topology optimization and high-frequency homogenization method	Shinji Nishiwaki
	by Kurioka, H., Noguchi, Y., Izui, K., Yamada, T. and Nishiwaki, S.	
348	Topology optimization of full and directional band gap acoustic metamaterials	Xiaopeng Zhang
	by Zhang, X. and Luo, Y.	

Design of metamaterials - II

Day: Thursday - June 17, 2021 Time: 7:00 PM - 7:50 PM MDT

Room: C

Chair and co-Chair: Yoon Young Kim and Hesaneh Kazemi

ID	Title	Presenter
104	Topology optimization using the representative volume element method and machine learning for functionally graded composite materials	Cheolwoong Kim
	by Kim, C., Lee, J. and Yoo, J.	
161	Concurrent shape optimization for multiscale structure using Hź gradient method	Minami Fujioka
	by Fujioka, M. and Shimoda, M.	
202	Topology Optimization of Monolayer Metamataerials for Total Mode Conversion of Elastic Waves	Won Uk Yoon
	by Yoon, W. U., Lee, J. S. and Kim, Y. Y.	
398	Investigation on numerical analysis and mechanics experiments of topology optimization of functionally graded lattice structure	Long Liu
	by Liu, L., Wang, T., Li, Z., Liu, W. and Yi, B.	
404	Optimal plate microstructures with ultimate stiffness for arbitrary multi-loadings	Yiqiang Wang
	by Wang, Y., Groen, J. P. and Sigmund, O.	
466	A heterogeneous lattice structure topology optimization method considering the stress constraint	Shuzhi Xu
	by Liu, J., Xu, S., Huang, J. and Ma, Y.	

Design optimization for advanced manufacturing - ${ m VII}$

Day: Thursday - June 17, 2021
Time: 7:00 PM - 7:50 PM MDT

Room: D

Chair and co-Chair: Qing Li and Daniel Milbrath De Leon

ID	Title	Presenter
67	Topology Optimization of Self-supporting Infills for Additive Manufacturing	Yichang Liu
	by Liu, Y., Wei, C. and Zhou, M.	
195	Three-dimensional topology optimization considering overhang constraint in B-spline space	Che Wang
	by Zhang, W., Wang, C., Zhou, L. and Gao, T.	
576	Variable lattice density optimization based on sequential inherent strain method used in additive manufacturing process	Akihiro Takezawa
	by Takezawa, A., Chen, Q. and To, A.	

Surrogate modeling for design optimization - II

Day: Thursday - June 17, 2021
Time: 8:00 PM - 8:50 PM MDT

Room: A

Chair and co-Chair: Xueguan Song and Youngsoo Choi

ID	Title	Presenter
106	An adaptive PCE-HDMR approach for high dimensional metamodeling	Jian Zhang
	by Yue, X., Zhang, J. and Gong, W.	
158	High-dimensional Global Optimization Method based on Decomposition and Knowledge Transfer	Qineng Wang
	by Guo, Z.	
226	A Surrogate-based Layout-shape coupling Optimization Strategy for Blended-Wing-Body Underwater Gliders	Weixi Chen
	by Chen, W., Wang, P., Dong, H. and Yu, X.	
280	A hierarchical surrogate assisted constrained particle swarm optimization method for expensive black-box op- timization problems	Kanghui Tao
	by Tao, K.	
313	A multi-model fusion based mode-pursuing sampling method for expensive black-box optimization problems	Ruobing Wang
	by Wang, R.	
497	Visual exploration of response space as a function of sampling density in input DoE	Rashmi Rama Sushil
	by Sushil, R. R. and Ramu, P.	

Design optimization considering eigenfrequency and dynamics - ${\rm IV}$

Day: Thursday - June 17, 2021

Time: 8:00 PM - 8:50 PM MDT

Room: B

Chair and co-Chair: Graeme Kennedy and Jianhua Rong

ID	Title	Presenter
63	Free-form optimization of vibration lures under real loading conditions for maximizing their fundamental frequencies	Jin-Xing Shi
	by Shi, J., Shimoda, M. and Sakai, S.	
217	Shape preserving design for structures under harmonic resonance response	Yulei Wang
	by Wang, Y., Zhu, J., Li, Y., Liu, T., Wang, J. and Zhang, W.	
350	Shorten Transient State Duration of Forced Vibration by Structural Optimization	Kun Yan
	by Yan, K. and Wang, B. P.	
451	Research on overall design method and concept realiza- tion of mechanical structure	Tianjian Li
	by Li, T. and Sun, W.	
509	Beam System Optimization with Flexible Multibody Dy- namics Considering Nonlinearity of Large Deformation, Mechanization and Contact	Yang Cheng
	by Du, J. and Yang, C.	
550	An Assessment of Topology Optimization Algorithms on Large-Scale Compliance and Eigenvalue Problems	Yicong Fu
	by Fu, Y. and Kennedy, G. J.	

Machine learning for design optimization - VI

Day: Thursday - June 17, 2021
Time: 8:00 PM - 8:50 PM MDT

Room: C

Chair and co-Chair: Amir H Gandomi and X. Shelly Zhang

ID	Title	Presenter
294	CNN-driven Approximate Algorithm of Topology Opti- misation Based on Initial Stress Learning	Jun Yan
	by Jun, Y., Qi, Z. and Qi, X.	
395	Data-driven topology design: A possibility of sensitivity- free structural optimization by deep generative models	Shintaro Yamasaki
	by Yamasaki, S., Yaji, K. and Fujita, K.	
428	Designing Phononic Bandgap Metamaterials with a Gaussian Mixture-Variational Autoencoder	Hongyi Xu
	by Wang, Z., Xian, W., Baccouche, M. R., Lanzerath, H., Li, Y. and Xu, H.	
473	A mechanistic-based data-driven approach to accelerate structural topology optimization through finite element convolutional neural network (FE-CNN)	Tianle Yue
	by Yue, T., Yang, H., Du, Z., Elkhodary, K. I., Tang, S. and Guo, X.	

Socializing - 9

Day: Thursday - June 17, 2021 Time: 9:00 PM - 10:00 PM MDT

Room: Lounge

Event				Organi	zer		
Roundtable: Artificial (Coffee Break Room)	Intelligence of	\overline{and}	Machine	Learning	Raissi hayan i		Sub-

Friday - June 18, 2021

Morning Sessions -7:00 - 11:00 AM MDT

SOTA Talks - 2

Day: Friday - June 18, 2021

Time: 7:00 AM - 7:50 AM MDT

Room: Auditorium Chair: Erik Lund

Title	Presenter
Digital transformation and optimization	Yoo Jeong Noh
System analysis and design in uncertainty	Mathieu Balesdent

Multi-material topology optimization

Day: Friday - June 18, 2021

Time: 8:00 AM - 8:50 AM MDT

Room: A

Chair and co-Chair: Erik Lund and Fabian Wein

ID	Title	Presenter
417	New concepts of lightweight gearbox rear covers made of aluminum and plastic using multi-material topology optimization	Ioanna Koutla
	by Koutla, I., Jossieaux, J., Deserranno, C., Bruyneel, M., Lopez, C., Eyckens, P. and Duysinx, P.	
434	Layout design of thin-walled structures with lattices and stiffeners using multi-material topology optimization	Yang Li
	by Li, Y., Song, L., Tang, L., Gao, T. and Zhang, W.	
511	Cellular Automata Mimicking Bodies Collision Applied to Multi-Material Topology Optimization	Katarzyna Tajs- Zielinska
	by Tajs-Zieliska, K. and Bochenek, B.	
534	Level-set Multi-material Topology Optimization with the XFEM	Adam Christopherson
	by Christopherson, A., Maute, K., Doble, K., Noel, L. and Schmidt, M.	
556	Multi-Material Topology Optimization for Embodied Carbon	Claire Holley
	by Holley, C., Ching, E. and Carstensen, J. V.	

Software

Day: Friday - June 18, 2021

Time: 8:00 AM - 8:50 AM MDT

Room: B

Chair and co-Chair: Sierk Fiebig and Miguel Aguilo

ID	Title	Presenter
125	An Efficient 180-line Matlab code for Adaptive Bubble Method (ABM) based topology optimization	Daoyuan Yu
	by Yu, D. and Cai, S.	
206	TopOpt.jl: Truss and Continuum Topology Optimiza- tion, Interactive Visualization, Automatic Differentia- tion, and More	Yijiang Huang
	by Huang, Y. and Mohamed, M. T.	
339	$A\ comparative\ study\ of\ educational\ codes\ on\ topology\ optimization$	X. Shelly Zhang
	by Wang, C., Zhao, Z., Zhou, M., Sigmund, O. and Zhang, X. S.	
458	10-Million-Voxels Interactive Topology Optimization from Mobiles Devices	Tuan Nguyen
	by Nguyen, T. T., Aage, N., Bærentzen, J. A. and Sigmund, O.	
561	Stress-constrained topology optimization: A stress aggregation-free educational software	Glaucio Paulino
	by Paulino, G. H. and Giraldo-Londoño, O.	
572	Enhanced synergy between topology optimization and additive manufacturing with integrated end-to-end digital innovation platform: Application to space components	Frédéric Duboeuf
	by Duboeuf, F., Lemaire, E., Remouchamps, A., van Eekelen, T., Chary, C., François, M., Vargalui, A. and Rodrigues, G.	

Truss topology optimization - I

Day: Friday - June 18, 2021

Time: 8:00 AM - 8:50 AM MDT

Room: C

Chair and co-Chair: Matthew Gilbert and Karol Bołbotowski

ID	Title	Presenter
62	Optimal design of grid systems for tall buildings using lattice structures	Janos Logo
	by Ismail, H., Bruggi, M. and Logo, J.	
199	Concurrent topology and geometry optimization of truss structures with global stability constraints	Alemseged Weldeyesus
	by Weldeyesus, A. G., Gondzio, J., He, L., Gilbert, M., Shepherd, P. and Tyas, A.	
269	A new growth method for truss shape and topology optimization	Tomasz Sokół
	by Kozłowski, G. and Sokół, T.	
403	Truss structure topology optimization for maximum shakedown multiplier	Kai Li
	by Li, K. and Cheng, G.	
520	Interactive layout optimization of long-span structures subject to self-weight and multiple load-cases	Helen Fairclough
	by Fairclough, H., Gilbert, M., Firth, I., Green, D., Pritchard, T. and Trodden, P.	

Topology optimization considering uncertainty - I

Day: Friday - June 18, 2021

Time: 8:00 AM - 8:50 AM MDT

Room: D

Chair and co-Chair: Franz-Joseph Barthold and Carl-Johan Thore

ID	Title	Presenter
49	Robust topology optimization when nominal and expected compliance are the same	Aniko Csebfalvi
	by Csebfalvi, A. and Logo, J.	
194	Worst-case design of plane frames using order statistics	Wei Shen
	by Shen, W., Ohsaki, M. and Yamakawa, M.	
447	Modeling of geometric uncertainties in topology optimization via the shift of design nodes.	Jonghyun Kim
	by Jonghyun, K. and Lee, I.	
525	Incorporating uncertainties in Topology Optimization: A Stochastic Reduced Order Model approach	Alberto Torres
	by Torres, A., Warner, J., Aguilo, M. and Guest, J.	

Optimization algorithms - I

Day: Friday - June 18, 2021

Time: 8:00 AM - 8:50 AM MDT

Room: E

Chair and co-Chair: Daniel Wilke and Mathias Stolpe

ID	Title	Presenter
86	Significant input variable selection for design optimiza- tion of piezoelectric energy harvester	Hansu Kim
	by Kim, H., Kim, T. and Lee, T. H.	
409	Computing multiple solutions of topology optimization problems	Ioannis Papadopoulos
	by Papadopoulos, I., Farrell, P. and Surowiec, T.	
423	Path Planning of Ship Collision Avoidance Using Improved A* Algorithm	Seo Chanhee
	by Seo, C., Noh, Y. and Abebe, M.	
523	The continuous stochastic gradient method with applica- tions in topology optimization	Lukas Pflug
	by Pflug, L., Stingl, M., Greishammer, M., Nees, N. and Uihlein, A.	
537	Hybrid Fireworks-Evolutionary Optimization Algorithm	Paweł Paździor
	by Paździor, P. and Szczepanik, M.	

Topology optimization with manufacturing constraints

Day: Friday - June 18, 2021

Time: 9:00 AM - 9:50 AM MDT

Room: A

Chair and co-Chair: Niclas Strömberg and Claus B.W. Pedersen

ID	Title	Presenter
80	Manufacturing Cost-Driven Topology Optimization of Welded Steel Frame Structures based on the Geometry Projection Method	Hongye Gu
	by Gu, H. and Norato, J.	
174	An Advection-Diffusion based Filter for Machinable Designs in Topology Optimization	Erik Albert Träff
	by Høghøj, L. C. and Träff, E. A.	
354	Parameterised Post-Processing of Topology Optimisa- tion Results	Maninder Sehmi
	by Christensen, J., Sehmi, M. and Wilson, A.	
489	A prototype software for topology optimization considering production constraints and multi-material design rules	Carlos Lopez Ro- driguez
	by Lopez, C., Rosseel, E., Naets, F., Deckers, E., Koutla, I., Duysinx, P. and Eyckens, P.	
517	Topology optimization for multi-axis machining	Joshua Gasick
	by Qian, X. and Gasick, J.	
526	Machining Constraints in Topology Optimization using Projection Methods	Hak Yong Lee
	by Lee, H. Y. and Guest, J. K.	

Truss topology optimization - II

Day: Friday - June 18, 2021

Time: 9:00 AM - 9:50 AM MDT

Room: B

Chair and co-Chair: Tomasz Sokół and Thilo Franke

ID	Title	Presenter
138	Combination of Structural Optimization Methods to Design Optimal Truss Structures	Kübra Ulukulu
	by Ulukulu, K., Fiebig, S. and Franke, T.	
175	Combined fail-safe and robust optimization of beam cross-section properties	Mathias Stolpe
	by Stolpe, M.	
400	Arch systems of minimum weight	Grzegorz Dzierzanowski
	by Dzieranowski, G. and Czubacki, R.	
551	Optimal design of reinforced concrete slabs	Matthew Gilbert
	by Gilbert, M., Liew, A., Lu, H., He, L. and Torelli, G.	
554	Vaults of minimum weight and compliance - form finding via 2D convex problem	Karol Bołbotowski
	by Bołbotowski, K.	

Topology optimization considering uncertainty - II

Day: Friday - June 18, 2021

Time: 9:00 AM - 9:50 AM MDT

Room: C

Chair and co-Chair: Janos Logo and Jianbin Du

ID	Title	Presenter
375	Stochastic topology optimization for superior robustness	Johannes Neumann
	by Neumannn, D. J.	
516	Topology optimization with worst-case material defects	Jannis Greifenstein
	by Greifenstein, J. and Stingl, M.	
530	Topology optimization with uncertain Dirichlet data	Carl-Johan Thore
	by Thore, C.	
536	Microscale Uncertainty in Macroscale Topology Opti- mization	Subhayan De
	by De, S., Maute, K. and Doostan, A.	

Optimization algorithms - ${\bf II}$

Day: Friday - June 18, 2021

Time: 9:00 AM - 9:50 AM MDT

Room: D

Chair and co-Chair: Chao Hu and Palaniappan Ramu

ID	Title	Presenter
390	Exact Size and Shape Optimization of Additively Manufactured Lightweight Planar Frame Structures with Manufacturability Constraints and Modern Global Optimization Methods	Oguz Toragay
	by Toragay, O., Silva, D. F., Vinel, A. and Shamsaei, N.	
397	Sequential separable conservative approximate integer programming algorithm for discrete variable structure topology optimization	Kai Sun
	by Sun, K., Liang, Y. and Cheng, G.	
452	On exact separabel models in structural optimization	Michael Stingl
	by Pflug, L.	
469	Global optimality in minimum compliance topology op- timization of frame and shell structures	Marek Tyburec
	by Tyburec, M., Zeman, J., Kruík, M. and Henrion, D.	
527	L-moments enabled modified Chebyshev bounds for Uncertainty Quantification	Naman Jain
	by Jain, N., Ramu, D. P. and Jayaraman, D.	
528	Design Variable Scaling for the Vertex Morphing Method	Armin Geiser
	by Geiser, A., Schmölz, D. and Bletzinger, K.	

Socializing - 10

Day: Friday - June 18, 2021

Time: 10:00 AM - 11:00 AM MDT

Room: Lounge

Event	Organizer
Design Optimization in Industry (Coffee Break Room)	Julian Norato

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