

iNCMDAO-2024

December 16-18, 2024
IISc-Bengaluru



*1st international and 7th National
Conference on Multidisciplinary Design,
Analysis, and Optimization
(iNCMDAO-2024)*



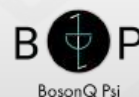
<https://incmdao2024.iisc.ac.in>

The 1st international and 7th edition of the National Conference on Multidisciplinary Design, Analysis and Optimization (iNCMDAO 2024) is organized in the verdant and vibrant campus of Indian Institute of Science (IISc), Bengaluru, from December 16 – 18, 2024.

This international conference follows the six national conferences on the MDAO theme held since 2018 (ncmdao.org). Indian Institute of Science (IISc) and the Aeronautical Society of India (AeSI) are the organizers of iNCMDAO-2024 that aims to bring together international researchers and the growing MDAO community in India from academia, industry, and government laboratories.

The conference provides a platform for invites talks, contributed paper presentations, interactive poster sessions, thematic sessions, panel discussions, and masterclass lectures on contemporary topics.

Sponsors



Programme

16 December 2024

A. R. Auditorium, Dept. of Mechanical Engineering, IISc

Masterclass 1

09:00 AM to 10:50 AM

Evolutionary Optimization for Practical Problem-Solving Tasks

Prof. Kalyanmoy Deb, Michigan State University, USA

Keynote Lecture 1

11:00 AM to 11:50 AM

Multiobjective Optimization: Applications in Computational Biology

Prof. Sanghamitra Bandyopadhyay, Indian Statistical Institute, Kolkata

Springer Nature Workshop for Authors

12:00 PM to 12:45 PM

Ms. Swati Meherishi, Springer Nature

Panel Discussion 1

02:00 PM to 02:45 PM

Careers in MDAO and Industry Academia Role

Moderator: Dr. Ravi Salagame, Autobotik

Masterclass 2

03:00 PM to 04:50 PM

Controlling Geometry in Topology Optimization:

Grey scale, Filtering, Robustness and Uncertainties

Prof. Ole Sigmund, Denmark Technical University, Denmark

BosonQPsi Workshop on Quantum Computing

05:00 PM to 06:00 PM

J. N. Tata Auditorium, IISc

Cultural Event

06:30 PM to 07:00 PM

Honouring MDAO Stalwarts in India

07:00 PM to 07:30 PM

Masterclass Dinner

07:30 PM Onwards

17 December 2024

J. N. Tata Auditorium, IISc

Inauguration

08:45 AM to 09:00 AM

Keynote Lecture 2

09:00 AM to 09:45 AM

Multiscale and Third Medium Approaches in Topology Optimization

Prof. Ole Sigmund, Denmark Technical University

Session 1

Invited Talks (1 - 4)

10:00 AM to 10:30 AM

Topology Optimization using Neural Networks

Prof. Krishnan Suresh, University of Wisconsin, Madison, USA

Towards a Digital Twin Framework in Additive Manufacturing

Prof. Wei Chen, Northwestern University, USA

Collaborative System of Systems Aviation Optimization - Opportunity and Challenges

Mr. Prajwal Shiva Prakasha, DLR, Germany

Optimization for Robots and robotic Systems: A Forty Year Story at IGMR

Prof. Corves Burkhard, RWTH-Aachen, Germany

Technical Sessions (four parallel sessions)

10:30 AM to 11:45 AM

Keynote Lecture 3

12:00 PM to 12:45 PM

Rise of Evolutionary Multi-Criterion Optimization

Prof. Kalyanmoy Deb, Michigan State University

Panel Discussion 2

02:00 PM to 02:45 PM

Towards Full-scale MDAO Problems in India

Moderator: Dr. Pankaj Priyadarshi, VSSC

Keynote Lecture 4

03:00 PM to 03:45 PM

AI and Machine Learning in Design Optimization: Emerging Developments

Prof. Prabhat Hajela, Rensselaer Polytechnic Institute

Session 2

Invited Talks (5 - 8)

04:00 PM to 04:30 PM

Rethinking Engineering Design with Generative AI

Prof. Faez Ahmed, Massachusetts Institute of Technology, USA

Computational Reconstruction of Heterogenous Material Behavior from Simple Contact Probing

Prof. Roger Sauer, Ruhr-Universität Bochum, Germany

Synthesis and Optimisation of the Dimensions of Mechanisms – Experiences and Lessons Learned

Prof. Mathias Huesing, RWTH-Aachen, Germany

Role of Structural Optimization in Aerospace Mechanisms Design

Mr. Pakeeruraju P, MDSD & DRDL

Technical Sessions (four parallel sessions)

04:30 PM to 05:45 PM

Networking and Mixer

05:45 PM to 06:30 PM

Carnatic Concert by Prof. Sankaran Mahadevan

06:30 PM to 07:30 PM

Banquet Dinner

07:30 PM Onwards

18 December 2024
J. N. Tata Auditorium, IISc

Keynote Lecture 5

08:45 AM to 09:30 AM

Uncertainty Quantification for MDAO

Prof. Sankaran Mahadevan, Vanderbilt University

Session 3

Invited Talks (9 - 11)

09:45 AM to 10:15 AM

A New Modeling Scheme for Multiphysics Systems and Structural Optimization

Prof. Gil Ho Yoon, Hanyang University, South Korea

**Optimisation Aspects in Computational Modelling of Operated Ventral Hernia
in the Context of its Mechanical Compatibility with a Human Abdominal Wall**

Prof. Izabella Lubowiecka, Gdańsk University of Technology, Poland

Transforming Aircraft Engines with AI

Mr. Rajesh Alla, Director of Data Science, GE Aerospace

Technical Sessions (four parallel sessions)

10:15 AM to 12:15 PM

Panel Discussion 3

12:15 PM to 01:00 PM

Optimal Use of Data in Aviation

Moderator: Dr. Ravi Rajamani, Independent Data Consortium for Aviation

Panel Discussion 4

02:00 PM to 02:45 PM

**Optimization at the Cross-roads of Machine Learning (ML), Generative
Artificial Intelligence (Gen AI) & Model Based Systems Engineering (MBSE)**

Moderator: Dr. Vinay Ramanath, Siemens

Session 4

Technical Sessions (four parallel sessions)

03:00 PM to 04:30 PM

Valedictory and Awards Session

04:30 PM to 05:30 PM

Patrons - Prof. Govindan Rangarajan and Dr. Kota Harinarayana

Conference Chair - Prof. G. K. Ananthasuresh

Committee Chairs :

Prof. Kalyanmoy Deb

Prof. Dhish Saxena

Prof. Anupam Saxena

Prof. Palaniappan Ramu

Dr. Ravi Salagame

Dr. Sourav Rakshit

Dr. Vinay Ramanath

Dr. Somanath Nagendra

Prof. M. Sivapragasam