

6th National Conference on Multidisciplinary Design, Analysis and Optimization (NCMDAO 2023)

December 6-8, 2023, IIT Guwahati

Venue: Conference Program

Day 1 (6 th December, 2023)				
09:00 - 09:30	Registration			
09:30 - 10:00	Inauguration			
10:00 - 11:00	Key Note Lecture: Prof. G. K. Ananthasuresh <i>Structural Optimization using Topological Derivatives</i> Chair: Prof. Rajiv Tiwari			
11:00 - 11:20	High - Tea			
	Hall 1 <i>Structural Optimization: Size, Shape, and Topology</i> Chair: Prof. Prabhat Kumar	Hall 2 <i>Design and Optimization of Materials and Metamaterials</i> Chair: Prof. Atanu Banerjee	Hall 3 <i>Machine Learning and Data Science in Optimization</i> Chair: Prof. S. M. Hazarika	Hall 4 <i>Systems Design and Optimization</i> Chair: Prof. Poonam Kumari
11:20 - 11:40	Paper ID: 002	008	121	024
11:40 - 12:00	006	033	136	083
12:00 - 12:20	011	034	067	144
12:20 - 12:40	057	078		046
13:00 - 14:00	Lunch break			
14:00 - 15:00	Expert Lecture: Prof. Dhish Kumar Saxena <i>Machine Learning Assisted Evolutionary Multi-Objective Optimization</i> Chair: Prof. Sachin Singh Gautam			
15:00 - 16:00	Expert Lecture (Master Class): Dr. Monalisa Pal <i>Modeling and Solving Optimization Problems with MATLAB and Simulink</i> Chair: Prof. Sachin Singh Gautam			
16:00 - 16:20	Tea Break			
	Hall 1 <i>Structural Optimization: Size, Shape, and Topology</i> Chair: Prof. G. K Anathasuresh	Hall 2 <i>Evolutionary, Bayesian, Heuristic Optimization Techniques, and Quantum Algorithms for Optimization</i> Chair: Prof. Hemant Kumar	Hall 3 <i>Machine Learning and Data Science in Optimization</i> Chair: Prof. Dhish Kumar Saxena	Hall 4 <i>Miscellaneous Topics</i> Chair: Dr. Vinay Ramanath
16:20 - 16:40	027	017	075	
16:40 - 17:00	039	018	079	009
17:00 - 17:20	040	021	106	030
17:20 - 17:40	081	092	120	043

Day - 2 (7 th December, 2023)			
09:00 - 10:00	Key Note Lecture: Prof. Palaniappan Ramu <i>Reimagining the world of optimisation with visual analytics: Principles, progress and prospects</i> Chair: Prof. Hemant Kumar Singh		
	Hall 1 <i>Structural Optimization: Size, Shape, and Topology</i> Chair: Prof. Prabhat Kumar	Hall 2 <i>Mixed Integer and Linear Programming</i> Chair: Dr. Monalisa Pal	Hall 3 <i>Systems Design and Optimization</i> Chair: Dr. Vinay Ramanath
10:00 - 10:20	Paper ID: 032	022	119
10:20 - 10:40	042	115	132
10:40 - 11:00	050	122	135
11:00 - 11:20	Tea Break		
	Hall 1 <i>Structural Optimization: Size, Shape, and Topology</i> Chair: Prof. G. K Anathasuresh	Hall 2 <i>Evolutionary, Bayesian, Heuristic Optimization Techniques, and Quantum Algorithms for Optimization</i> Chair: Prof. Hemant Kumar Singh	Hall 3 <i>Miscellaneous Topics</i> Chair: Prof. Abhishek Kumar
11:20 - 11:40	065	026	090
11:40 - 12:00	103	070	094
12:00 - 12:20	134	077	133
12:20 - 12:40	149	126	140
12:40 - 13:00			
13:00 - 14:00	Lunch break		
14:00 - 14:30	Expert Speaker (Industry Talk): COMSOL Chair: Prof. Deepak Sharma		
14:40 - 15:40	Expert Speaker (Industry Talk): BosonQ Psi Chair: Prof. Deepak Sharma		
16:00 - 16:20	Tea Break		
	Hall 1 <i>Optimization in Industry 4.0/Digital Twin/IoT/Smart manufacturing & Industry Applications and Case Studies in MDAO</i> Chair: Prof. Ashish Anand	Hall 2 <i>Design and Optimization of Materials and Metamaterials & Optimization and Additive Manufacturing</i> Chair: Prof. Palaniappan Ramu	Hall 3 <i>Miscellaneous Topics (TIH Session)</i> Chairs: Prof. P. S. Robi and Prof. Ajay Dashora
16:20 - 16:40	052	044	124
16:40 - 17:00	086	069	076
17:00 - 17:20	010	071	016
17:20 - 17:40	029	110	118
19:30 - 21:00	Conference Gala Dinner		

Day - 3 (8th December, 2023)

09:00 - 10:00	Key Note Lecture: Dr. Vinay Ramanath <i>Optimization and Uncertainty Quantification “a peek into the future”: Challenges “pronounced” as opportunities</i> Chair: Prof. Deepak Sharma			
	Hall 1 <i>Miscellaneous Topics</i> Chair: Prof. Abhishek Kumar	Hall 2 <i>Machine Learning and Data Science in Optimization</i> Chair: Prof. S. M. Hazarika	Hall 3 <i>Systems Design and Optimization</i> Chair: Prof. Palaniappan Ramu	Hall 4 <i>Miscellaneous Topics</i> Chair: Prof. Sachin Singh Gautam
10:00 - 10:20	Paper ID: 088	080	084	145
10:20 - 10:40	101	127	107	004
10:40 - 11:00	143	128	097	113
11:00 - 11:20	Tea break			
	Hall 1 <i>Miscellaneous Topics</i> Chair: Prof. Arindam Dey	Hall 2 <i>Machine Learning and Data Science in Optimization</i> Chair: Prof. Ashish Anand	Hall 3 <i>Multiscale and Multiphysics Problems</i> Chair: Prof. Atanu Banerjee	Hall 4 <i>Miscellaneous Topics</i> Chair: Prof. Sachin Singh Gautam
11:20 - 11:40	096	035	013	028
11:40 - 12:00	111	036	020	056
12:00 - 12:20	085	150	062	148
12:20 - 12:40				078
12:40 - 13:00	Valedictory			
13:00 - 14:00	Lunch break			

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Paper ID	Details
002	<i>Basis splines to perform isogeometric topology optimisation to design the outline of a bridge pier and evaluate the compliance based Performance Index</i> K N V Chandrasekhar University College of Engineering Osmania University
004	<i>Speaker Recognition System and Speech Features Characteristics</i> Snehankitha M, Nilu Singh KLEF
006	<i>Topology Optimisation of Reinforced Concrete Structures having openings using bsplines</i> K N V Chandrasekhar University College of Engineering Osmania University
008	<i>Topology Optimization of Metamaterials using Functionally Graded Material</i> U Meenu Krishnan, Abhinav Gupta, Rajib Chowdhury IIT Roorkee
009	<i>A Combined TOPSIS-AHP-Method-Based Approach for Selection of Propellant for a Cold-Gas Thruster in a Micro-Satellite</i> Akshita Arora, Surya Sudhakar Kalluri, Ravi V, Aravind Vaidyanathan Vikram Sarabhai Space Center ISRO
010	<i>Air Intake Duct Optimisation for a Twin Engine Aircraft</i> Abilashini R, Valliammai Somasundaram Aeronautical Development Agency DRDO
011	<i>Adaptive topology optimization in fourth-order plate problems using isogeometric PHT-Splines</i> Philip Luke Karuthedath, Abhinav Gupta, Bhagath M, Rajib Chowdhury IIT Roorkee
013	<i>A coupled fluid-thermo-structural solver</i> Akshay Prakash, Kushan Verma, Dibya Ranjan Sahoo, P. C. Jain, Mohammed Rabius Sunny IIT Kharagpur
017	<i>Optimization of an Airfoil with a Cavity Using Response Surface Methods</i> Akshita Arora, Ankit Tiwari Vikram Sarabhai Space Center ISRO
018	<i>Efficient multiple flaw detection using SBFEM and Bayesian inference</i> Pugazhenthii Thananjayan, Sundararajan Natarajan, Palaniappan Ramu IIT Madras

Paper ID	Details
020	<i>Data-Driven Model of Thomson Coil Using Dimensionless Parameters</i> Vishakha Harlapur, Salil Kulkarni Eaton India Innovation Center
021	<i>A Novel Niching Technique for Multimodal Optimization</i> Mahesh Shankar, Kalyanmoy Deb, Palaniappan Ramu IIT Madras
022	<i>Mixed Integer Linear Programming approach for optimal transition of fleet to electric</i> Abhay Kumar, Deepak Nagar, Vinay Ramanath, Smaran Subbaiah Siemens
024	<i>Multi-disciplinary Design Optimization of Conceptual Design of Hybrid Drone using Evolutionary Algorithm</i> Shraddha C, Pankaj Priyadarshi Vikram Sarabhai Space Center ISRO
026	<i>Quantum assisted Evolutionary Algorithm for topology optimization</i> Kandula Eswara Sai Kumar, Rut Lineswala BosonQ Psi
027	<i>Structural Design and Optimization of Composite Serpentine Air Intake for UAV</i> Julian Rohit R, Siddharth Rastogi Aeronautical Development Establishment DRDO
028	<i>Analyzing Aeroelastic Wing Flutter: Trends in Eigenvalues and System Speeds for Improved Aircraft Design and Safety</i> Akshayraj N Dayananda Sagar University
029	<i>Development of a Hybrid BCGA Tuner for Artificial Neural Network in assessing the performance of Electromagnetic Forming and Perforation (EMFP) of Al6061-T6 tube.</i> Avinash Chetry, Arup Kumar Nandy IIT Guwahati
030	<i>Transient Analyses of Shape Memory Alloy Structures</i> Animesh Kundu, Dr. A. Banerjee IIT Guwahati
032	<i>Application of Multi Optimization techniques on Transmission Components</i> Prudhvi Raj Paluru, Yogesh Bhalekar, Vipin Rane Eaton India Innovation Center
033	<i>Stress-driven topology optimization based design of auxetic microstructure</i> Anurag Gupta, U Meenu Krishnan, Abhinav Gupta, Rajib Chowdhury IIT Roorkee

Paper ID	Details
034	<i>Towards the Design of a Tensegrity Lattice Metamaterial with Tunable Wave Propagation Characteristics</i> Mohammed Rabius Sunny, Sunny Akhtar Aliah University
035	<i>Linear and Non-linear Reduced Order Model of Scram-jet</i> Arun Neelan IIT Madras
036	<i>Aerodynamic Shape Optimization at Low Reynolds Numbers using Artificial Neural Network (ANN) Model</i> Chiranth N Raj, M Sivapragasam M. S. Ramaiah University of Applied Sciences
039	<i>Comparison study of FEM and IGA based topology optimization methods for elastic structures</i> Tejdeep Ganekanti, Umesh Mishra, Dr. A. Banerjee IIT Guwahati
040	<i>Adjoint based Airfoil and Freeform Shape Optimization using OpenMDAO and Metacomp Software Suites</i> Chellappan Balaji Metacomp Technologies Pvt Ltd
042	<i>Optimization of the bypass duct shape for the effective icing air flow to the turboprop engine using numerical method</i> Vinay C A CSIR-NAL
043	<i>Unmanned Aerial Vehicle (UAV) with Heavy Payload Capacity and Enhanced Stability</i> K Raghav, T Karthik, Sripad Kulkarni S, Dr. Prashantha Kumar H. G. Dayanand Sagar University
044	<i>Metamaterial topology optimization using enhanced deep super-resolution neural network</i> Ajendra Singh, Shubham Saurabh, Abhinav Gupta, Rajib Chowdhury IIT Roorkee
046	<i>Conceptual Design and Optimization of Long Endurance Platform for Venus Exploration</i> Shantanu S. Gulawani ¹ and Rajkumar S. Pant Department of Aerospace Engineer, Indian Institute of Technology Bombay, Mumbai, India
050	<i>Economic Optimization of Silicon Carbide Insulation for Orbiter Re-entry</i> Abhishek Upadhye, Gautam Kamble, K. D. Joshi Tatyasaheb Kore Institute of Engineering & Technology
052	<i>An Online Clustering Approach using Pareto Solutions for Industrial Data</i> Vamanie Perumal, Palaniappan Ramu, Palaniappan Ramu IIT Madras

Paper ID	Details
056	<i>Design and Analysis of Micro-Gas Turbine Rotor Balancing System.</i> Manjunatha H G, Balaji Sankar, Sadanand Kulkarni, L P Manikandan, Brijeshkumar J Shah, Satish Kumar S, H K Ranga Vittal BMS College of Engineering
057	<i>Optimizing Mechanical Component Shape for Uniform Contact Stress: A Study using Iso-Geometric Analysis</i> Konatham Raja Sekhar, Hari Voruganti, Sachin Singh Gautam National Institute of Technology Warangal
062	<i>High fidelity systems modeling of thermo-fluid cold plate and electro-thermal battery pack</i> Thean Mani Rajan Kanagaraj, AjayKumar MST, Anand Pitchaikani, Erik Durling, and John Batteh Modelon Engineering Private Limited
065	<i>Machine learning based ROM prediction for a lumbar motion unit.</i> Subin George, Krishnan Venkatesh, Saravana Kumar Gurunathan IIT Madras
067	<i>Effort and Cost Estimation in Agile Software Development</i> Sandeepak Singh, Harishita Rana, Tarang Sharma UIET Chhatrapati Shahu Ji Maharaj University KANPUR
069	<i>Investigation Of Proton Irradiation Effects In N-In-P-MCz Thin Silicon Pixel Detector For FCC Experiments</i> Ashi Jain, Puspita Chatterjee, Ajay Srivastava Chandigarh University
070	<i>Quantifying Player Performance and Optimizing Team Selection in Fantasy T20 Cricket</i> Adharsh Prasad Natesan, Ajith Ravi, Aswath Suresh Safe Security
071	<i>Template Based Generation of Tree-like Support Structure for Additive Manufacturing</i> Vishnu Prasad K R, Gaurav Kumar Sharma National Institute of Technology Warangal
075	<i>NIFTY 50 PREDICTION USING MACHINE LEARNING ALGORITHMS AND TECHNICAL INDICATORS</i> Swetha B, Kriti Arya Vellore Institute of Technology Chennai
076	<i>A Classical Multi-objective Approach for Coverage Path Plans for a Mobile Robot in an Uneven Terrain</i> Monex Sharma, Hari Voruganti National Institute of Technology Warangal
077	<i>Incorporating Qualitative Preferences in Evolutionary Multi-Criteria Decision-Making</i> Deepanshu Yadav, Palaniappan Ramu, Kalyanmoy Deb IIT Madras

Paper ID	Details
078	<i>Machine Learning Based Predictions of Effective Elastic Properties of Auxetic Honeycomb Lattice</i> Rajnandini Das, Saravana Kumar Gurunathan IIT Madras
079	<i>Advancing Heart Disease Prediction: A Comparative Study of Tree-Based Algorithms for Indian Patients</i> Aswini K, Kriti Arya Vellore Institute of Technology Chennai
080	<i>Grasp Force Optimization as a Bilinear Matrix Inequality Problem: A Deep Learning Approach</i> Hirakjyoti Basumatary, Riddhiman Shaw, Daksh Adhar, Shyamanta Hazarika IIT Guwahati
081	<i>Structural Topology Optimization Of Fractured Materials</i> Rakesh Kumar Tota, Marco Paggi IMT School for Advanced Studies Lucca
083	<i>Energy storage sizing and management using optimization for an anticipated duck curve in Mumbai</i> A H Harisankar, Akhil Nandan, Anand Pitchaikani Modelon Engineering Private Limited
084	<i>Visualization-aided Design Space Exploration of MDO Problems</i> Deepanshu Yadav, Mohan Raj, Palaniappan Ramu IIT Madras
085	<i>Multiobjective Modeling and Optimization of Proton Exchange Membrane Fuel Cell using Genetic Algorithm</i> Dharmik Patel and Deepak Sharma IIT Guwahati
086	<i>AUTOMATIC HEADLIGHT LUMINANCE ADJUSTMENT SYSTEM</i> Rajkumar K. K, Alfia Sherly. R. C, Chandeepraj. R, Dakshineh R, Hari Roshan. T SNS Institutions
088	<i>A Dual Branch Attention Enhanced CNN-LSTM Model for Diagnosis of Parkinson's Disease</i> Rakesh Kiran, Deepak Sharma, A Anand IIT Guwahati
090	<i>Estimation of Optimal Weibull Parameters for Wind Power Potential Assessment of Indian Coastal Site using Reanalysis Data</i> Harsh Patidar, Vikas Shende, Prashant Baredar, Archana Soni Maulana Azad National Institute of Technology
092	<i>Multi-Objective Artificial Bee Colony Algorithm Using theta-Dominance and Reference Lines</i> Deepak Sharma, Sandesh Deshmukh, Abhishek Sarathe IIT Guwahati

Paper ID	Details
094	<i>Optimization of Weibull Parameters for Offshore Wind Potential Assessment with Reanalysis data using Metaheuristic algorithms</i> Harsh Patidar, Vikas Shende, Prashant Baredar, Archana Soni Maulana Azad National Institute of Technology
096	<i>Bounded constraint normalization scheme and conditional penalized objective function for exterior penalty function method</i> Dilip Datta Tezpur University
097	<i>A Machine Learning Based Open-Source Tool For Predictive Maintenance</i> Sanket Krushna Patil, Sibasis Sahoo, Deepak Sharma, A Anand IIT Guwahati
101	<i>Assessment of Various Distance Minimization Algorithms for Isogeometric Contact Analysis</i> D Srinivasulu, Sumit Kumar Das, Sachin Singh Gautam IIT Guwahati
103	<i>PyHexTop: a compact Python code for topology optimization using hexagonal elements</i> Aditi Agarwal, Anupam Saxena, Prabhat Kumar IIT Hyderabad
106	<i>Optimization of Skeletal muscle concurrent usage data to create customization Protocol</i> Supriya S, Raghul Gandhi Venkatesan, Shantanu Patil, Bagavandas M SRM Institute of Science and Technology
107	<i>Study of new approach to select optimum configuration for HAPS using Discrete-Multi Criteria Decision Making (D-MCDM) Methods</i> Vadivelan Alagurajan, Joisar Priyesh Jitendra, Rajagopal S, Vinayak Kulkarni Aeronautical Development Establishment DRDO
110	<i>Optimization of process parameters during additive manufacturing of Oldham Coupling</i> Yogeshwaran K, Shubhajit Das, Nagarjun J NIT Arunachal Pradesh
111	<i>UniPop: A unidirectional search based global optimizer assisted by population of solutions without gradient information</i> Dilip Datta Tezpur University
113	<i>Investigation of Multiaxial Fatigue Behavior of 304LN Stainless Steel under Various Cyclic Loading Waveforms and Comparing the Damage</i> Sayan Ghosh, Surya P Rao, P.P Dey, S Sivaprasad IEST Shibpur
115	<i>Reconfiguration of power distribution networks for energy loss minimization using mixed integer programming</i> Subhadarshini Panda, Sanjib Ganguly IIT Guwahati

Paper ID	Details
118	<i>Deciphering Uncertainty in Excess Pore Water Pressure Profile in Single Drainage 1D Consolidation through Feynman-Kac Formulation</i> Naina Deb, Dr. B Hazra, Arindam Dey IIT Guwahati
119	<i>An Improved Goswami Cycle Assisted by a Distillation Unit: A Comparison and Optimization Study</i> Adityabir Singh, Ranjan Das IIT Ropar
120	<i>iSOM-derived Explainable Outcomes for Engineering Applications</i> Rishwanth Myanapuri, Velduti Venkata Kishore, Agnes Nirmala Srinivasan1, Vijay Mani, Deepanshu Yadav, Palaniappan Ramu IIT Madras
121	<i>TOaCNN: Adaptive Convolutional Neural Network for Multidisciplinary Topology Optimization</i> Khaish Chadha, Prabhat Kumar IIT Hyderabad
122	<i>A Mixed Integer Linear Optimization Model to Restore the Operation of Power Distribution Networks after High Impact Low Probability Failure Events</i> Vandana Kumari, Sanjib Ganguly IIT Guwahati
124	<i>A Comparative Study of Pareto-front of Optimal Solutions Set for NAO Robot's Gait Optimization Using the Dominance Move Indicator based on Mixed Integer Programming</i> Pushpendra Gupta, Dilip Kumar Pratihar, Kalyanmoy Deb IIT Kharagpur
126	<i>Coverage Maximization for UAV Surveillance on Non-convex Domains using Genetic Algorithm</i> Arpit Dwivedi, Chinmay Pimpalkhare IIT Bombay
127	<i>Evaluating the Performance of Different Optimizers for Deep Learned Finite Elements</i> Ankit Singh, T. V. K. Subhash, Dipjyoti Nath, Sachin Singh Gautam IIT Guwahati
128	<i>Evaluation of Optimizers in DNN-based Classification Model for Quadrature Rule in Isogeometric Analysis</i> Dipjyoti Nath, Ankit Singh, Debanga Raj Neog, Sachin Singh Gautam IIT Guwahati
132	<i>A Comparative analysis and Optimization of a Distillation Unit Assisted Goswami Cycle-Absorption Chiller Assembly</i> Adityabir Singh, Ranjan Das IIT Ropar
133	<i>Aerodynamic Analysis of Winglet through Optimization using CFD</i> Harshvardhan Solanki, Pankaj Priyadarshi, Shraddha C Vikram Sarabhai Space Center ISRO

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134	<i>Topology and Structural Optimization for the Fuselage of Hybrid Drone</i> Aditya Chandra Murty Yedavalli, Pankaj Priyadarshi, Shraddha C Vikram Sarabhai Space Center ISRO
135	<i>Conceptual Sizing and Optimization of the Propulsion System Sizing for a Hybrid Drone</i> Malavika Ajith, Shraddha C, Pankaj Priyadarshi Vikram Sarabhai Space Center ISRO
136	<i>Assessing the status of mental well-being for students of HEI: A data-driven approach</i> Princy Verma, Millie Pant, Mukesh Kumar Barua IIT Roorkee
140	<i>Chainless Drive Train Mechanism with Bearing Gear and Customized Sprocket Gear for Bicycle</i> Utsav Talaviya, Smit Patel, Nisarg Solanki, Krunal Mehta Pandit Deendayal Energy University
143	<i>Optimization Strategies on Evolving a Blade Profile of Savonius Wind Turbine</i> Man Mohan, Deepak Sharma, Ujjwal K. Saha IIT Guwahati
144	<i>Deciphering relationship among design variables of a battery pack system through multi-objective optimization</i> Abhimanyu Singh, Deepak Sharma, Poonam Kumari IIT Guwahati
145	<i>Fish Classification Analysis Model Using Convolutional Neural Network and Different Optimization Techniques</i> Kshatrapal Singh KIET Group of Institutions Delhi-NCR Ghaziabad
148	<i>Failure Rate Prediction Method of Evolutionary Parts</i> Garima Sharma, Jitendra Mishra Eaton India Innovation Center
149	<i>Design of Vertical Axis Wind Turbine</i> Hemant Jawale, Chahande Abhijit Visvesvaraya National Institute of Technology
150	<i>Generative Adversarial Network for Heart Disease Prognosis Using Deep Learning Machines</i> Somya Goyal Manipal University Jaipur