NCMDAO-2021 Program

4th NATIONAL CONFERENCE ON MULTIDISCIPLINARY DESIGN, ANALYSIS, & OPTIMIZATION

October 7-9, 2021

The support from the following organisations is gratefully acknowledged:

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Welcome Message

On behalf of the organizing committee, we welcome you to the 4th National Conference on Multidisciplinary Design, Analysis and Optimization (4th NCMDAO) held online from October 7-9, 2021.

This conference is the 4th in the series of NCMDAO and happens at IIT Madras this year. While there are many downsides to a virtual conference, it permits low carbon footprint, reduced registration fee and access to anyone from anywhere, who is interested in the conference. Therefore, though many of us will miss meeting colleagues and friends in person, there are certainly positive aspects of holding 4th NCMDAO online.

The 4th NCMDAO will feature 70 paper presentations, 8 poster presentations, two masterclass, two impact talks, two keynotes, 3 invited talks and 3 sponsor talks. The student design competition in an addition to this conference. Since participants might not be able to take off the whole day to attend the conference, in the given WFH scenario, the conference time was chosen to be 3-9PM. This timing enabled inviting speakers from other countries as well.

The conference platform will provide a seamless conference experience. The participants will undoubtedly have a near-offline conference experience with the virtual backdrops consisting of lobby, lounge, auditorium and sponsor booths. All registered participants will be provided with login credentials to access the conference platform. We have 6 sessions with 4 parallel tracks in each session. Each paper presentation will be for 15 minutes including Q&A. Participants are strongly encouraged to familiarize themselves with the virtual conference platform and other online features. We will email a set of training videos to all the participants.

We hope that you will enjoy the 4th NCMDAO and do not hesitate to contact us if you have any questions, comments or suggestions.

Wishing you a very productive conference!

The core organizing committee

- Abdus Samad, R. K. Amit, Palaniappan Ramu, P. Pradeep Pratapa, Ramanathan Muthuganapathy, Ratna Kumar Annabattula, Saravana Kumar G, Sayan Gupta and Sourav Rakshit

About NCMDAO

The conference jointly organized by Engineering Design department of the Indian Institute of Technology Madras (IITM), Mechanical Engineering department at the Indian Institute of Science, Bengaluru (IISc) and Design division of the Aeronautical Society of India (AeSI) aims to bring together researchers and industry professionals working in the areas of multidisciplinary design, analysis, and optimization. Established techniques and emerging technologies are equally emphasized to take advantage of the past accomplishments and step up the future of optimization-based design and model-based systems. The focus is on design and analysis as applicable to optimization of systems. Optimization in aerospace, automotive, manufacturing, biomedical and other application domains are within the scope of this conference.

Topics of interest include, but are not limited to:

- Structural Optimization: Size, Shape, and Topology
- Optimization for Design of Materials and Metamaterials
- Multiscale and Multiphysics Problems
- Metamodeling or Surrogate Modeling
- Systems Design and Optimization
- Machine Learning and Data Science in Optimization
- Mixed Integer and Linear Programming
- Evolutionary, Bayesian, and Heuristic Optimization Techniques
- Uncertainty Quantification, Reliability, and Robustness in Design
- Optimization and Additive Manufacturing
- Industry Applications and Case Studies in MDAO
- Emerging Trends in Optimization

Organization of NCMDAO 2021

Patrons

Prof. Bhaskar Ramamurthi, Director	IIT Madras
Dr. Kota Harinarayana, Chairman, Design Division	AeSI

Advisory Committee

Prof. G. K. Ananthasuresh	IISc
Prof. Chakravarthi Balaji	IITM
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Mr. Vinay Ramanath	Siemens, India

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Prof. R. K. Amit	IITM (Papers)
Prof. Palaniappan Ramu	IITM (General)
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Prof. Ramanathan	IITM (Website)
Prof. Ratnakumar A	IITM (Sponsors)
Prof. Saravana Kumar G	IITM (General)
Prof. Sayan Gupta	IITM (Speakers)
Prof. Sourav Rakshit	IITM (Finance)

Virtual Conference Platform

The virtual conference has been built and operated by Vfairs. All participants will receive an email prior to 5th October, 2021, with the web address of login page and instructions for login.

The virtual conference platform features several functions that allow the participants to assemble an individual conference and other events. Participants can join conference using ZOOM link which will become active 5 minutes before time. All participants are strongly encouraged to familiarize themselves with the platform to start of the live part of the conference on 7th October, 2021.

A demo of how to navigate the virtual platform will be available on website on 5th October, 2021.

Code of Conduct

All attendees of NCMDAO 2021 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 screenshots 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. NCMDAO 2021 reserves the right to take any action deemed necessary and appropriate, including immediate removal from the NCMDAO 2021 virtual platform without warning or refund, in response to any incident of unacceptable behaviour.

Talks and Speakers

Masterclass

Prof. Bruno Sudret,
ETH Zürich

Nora Lüthen,
ETH Zürich

Title: Polynomial Chaos Expansions (PCE) and UQLab

7 October 2021, 12:00 – 15:00

Moderator: Prof. Sayan Gupta, IIT Madras

Prof. Felipe A.C. Viana,
Univ. of Central Florida

Title: Graphs and Physics-informed Neural Networks (PINNs) for hybrid modelling and Uncertainty Quantification

7 October 2021, 18:00 – 21:00

Moderator: Prof. Palaniappan Ramu, IIT Madras

Keynote

Dr. William Baker,
Skidmore, Owings & Merrill
(SOM)

Title: Maxwell, Rankine, Airy and Modern Structural Engineering Design

8 October 2021, 18:35 – 19:25

Moderator: Prof. G. K. Ananthasuresh, IISc

Prof. Wei Chen,
Northwestern University

Title: Interdisciplinary Data-driven Design of Engineered Materials Systems

9 October 2021, 18:35 – 19:25

Moderator: Prof. Sayan Gupta, IIT Madras

Impact Talk

Mr. Suresh Kumar,
MacApp Studio and Pepul

Title: Process innovation in HR policies - a systems perspective in building a million dollar company

8 October 2021, 17:30 – 18:00

Moderator: Prof. Palaniappan Ramu, IIT Madras

Mr. Ramasubramanian,
VillageRES

Title: Decentralising & demystifying renewable energy technologies for the remote rural population

8 October 2021, 18:00 – 18:30

Moderator: Prof. Palaniappan Ramu, IIT Madras

Invited

Dr. Arvind Kumar, Optym

Title: Using optimization for managing Electric Vehicle (EV) loads on power grid

9 October 2021, 17:30 – 18:00

Moderator: Dr. Kota Harinarayana, AeSI

Dr. S A Ilangovan, ISRO

Title: Batteries for space: Design & Challenges

9 October 2021, 18:00 – 18:30

Moderator: Dr. Kota Harinarayana, AeSI

Dr. N. R. Srinivasa Raghavan,
Tarxya Limited

Title: Industrial applications of AI/ML/Optimization

9 October 2021, 19:30 – 20:00

Moderator: Prof. Sayan Gupta, IIT Madras

ANSYS Preconference Talk

Title: Robust Design Optimization using Simulation

7 October 2021, 17:30 – 18:00

Moderator: Prof. Ratnakumar A, IIT Madras

Mr KVS Ravikrishna, ANSYS

Sponsors Talk

Title: Generative Design: Harnessing the Power of Compute for Design

8 October 2021, 19:30 – 20:00

Moderator: Prof. Ratnakumar A, IIT Madras

Dr. Nanda Santhanam,
Autodesk

Title: CAE model Parameterization, Optimization and integration of Machine Learning

8 October 2021, 20:05 – 20:30

Moderator: Prof. Ratnakumar A, IIT Madras

Kesava Reddy Koduru,
BETA CAE Systems India

Title: Process Integration and Design Optimization: Industrial applications

9 October 2021, 20:05 – 20:30

Moderator: Prof. Ratnakumar A, IIT Madras

Mr Amit Agarwal, ANSYS

Program Overview

All timings are mentioned in Indian Standard Time.

Day 1

7 October, 2021

12:00 – 15:00	Masterclass 1
15:05 – 16:25	Poster Presentation
16:30 – 17:30	Student Competition
17:30 – 18:00	ANSYS Preconference Talk
18:00 – 21:00	Masterclass 2

Day 2

8 October, 2021

15:00 – 15:30	Inauguration
15:45 – 16:45	Paper Presentation - Session 1 (4 Parallel Tracks)
16:45 – 17:15	Paper Presentation - Session 2 (4 Parallel Tracks)
17:30 – 18:00	Impact Talk 1
18:00 – 18:30	Impact Talk 2
18:35 – 19:25	Keynote 1
19:30 – 20:00	Sponsor Talk 1
20:05 – 20:30	Sponsor Talk 2
20:30 – 21:00	Paper Presentation - Session 3 (4 Parallel Tracks)

Day 3

9 October, 2021

15:00 – 16:00	Paper Presentation - Session 4 (4 Parallel Tracks)
16:15 – 17:15	Paper Presentation - Session 5 (4 Parallel Tracks)
17:30 – 18:00	Invited Talk 1
18:00 – 18:30	Invited Talk 2
18:35 – 19:25	Keynote 2
19:30 – 20:00	Invited talk 3
20:05 – 20:30	Sponsors Talk 3
20:30 – 21:00	Paper Presentation - Session 6 (4 Parallel Tracks)

Detailed Program

DAY 1

Poster Presentation

Day:	Thursday – 7 October 2021	
Time:	15:05 – 16:25	

<div align="right">Chair: Prof. Saravana Kumar</div>

ID	Time	Title	Presenter
3	15.05	*Moving Towards Autonomous Vehicle Engineering: Indian Perspective* Ajay Mahawadiwar	Ajay Mahawadiwar
17	15:15	*Seating System in Indian Public Transport* Surya Chaurasiya, Dr. Tripti Singh	Surya Chaurasiya
27	15:25	*Importance of PCB board characterization & Safety Factor of Microcontroller based Design with External Crystal* Sagar D Jadhav, Prashant M Joshi	Sagar D Jadhav
46	15:35	*Inverse Design to Stop Unwanted Second Harmonics in Nonlinear Ultrasonics* Pravinkumar Ghodake	Pravinkumar Ghodake
74	15:45	*Molecular Dynamics of Carbon Capture from the Emissions of an IC Engine using ZSM-5* Deepak L, Ganesh A, Dit R S, Srihari S H, Vinod V, Krishnamohan G P	Deepak L
95	15:55	*Thermal frequency stability test for multiple ICs* Merlyn Kuriakose, Aryadevi A.N.	Aryadevi A.N.
97	16:05	*Design of Dynamic Vibration Absorbers Using a Cluster-Based Algorithm combined with Fuzzy C- means Technique* Jobie Earnest, Premchand V P	Jobie Earnest
111	16:15	*Integration of IFF Interrogator system with Fire Control Radar (FCR) on Fighter Aircraft* Naveen Kumar S, Arathi K R, Arshnarayan Sahu	Naveen Kumar S

Autodesk Design Competition

Day:	Thursday – 7 October 2021	
Time:	16:30 – 17:30	

Problem Title: Design of heat exchanger for solar still application

Team	Time	Team Name
1	16.30	Team Control
2	17:00	Team Technik

<u>DAY 2</u>

Inauguration Programme

Day: Friday – 8 October 2021

Time: 15:00 – 15:30

15:00	Welcome Address	:	**Prof. Palaniappan Ramu** IITM, Core committee
15:05	History of NCMDAO	:	**Mr. Vinay Ramanath** Siemens, Advisory committee
15:10	Perspectives on Design Optimization	:	**Dr. Kota Harinarayana** Chairman, BOG, IIT Varnasi, Patron
15:15	Chief Guest address	:	**Prof. Bhaskar Ramamurthi** Director, IIT Madras, Patron
15:20	About ISSMO/SMO	:	**Prof. Gengdong Cheng** EIC J. SMO, Advisory committee
15:25	Introducing the technical program	:	**Prof. Phanisri Pradeep Pratapa** IITM, Core committee
15:30	Vote of Thanks	:	**Prof. Saravana Kumar** IITM, Core committee

Session 1

Day:	Friday – 8 October 2021
Time:	15:45 – 16:45

S1T1: Data Driven Decision/AI/ML **Chair: Prof. Ramanathan**

ID	Time	Title	Presenter
47	15:45	*AI Driven Defect Reduction in Automobile Painting* Sailesh Kolachana, Swati Gupta, Ganesh Singh and Abdemanaaf Ghadiali	Sailesh Kolachana
20	16:00	*Effective Decision Making in Early Design Stage of Product using TODIM Method* Ayush Bhokare and Dr. Varun Tiwari	Ayush Bhokare
11	16:15	*Automation of Launch Vehicle Telemetry- Requirements Capture to Analysis of Data* Anjana S.J, Renjith P, Kuntamukkala S Manyam, Abey Rose J, Syamlal L S, Praseetha S, Jayalekshmi L, Chandrasekharan C and Anna Priya Koshi	Anjana S.J
35	16:30	*3D Spatio-Temporal prediction of atmospheric quantities for Cn2 Modeling using Machine Learning* Suraj Subramanian and Rishav Kanth	Suraj Subramanian

S1T2: Aerodynamics/ CFD **Chair: Prof. Abhijit Gogulapathi**

ID	Time	Title	Presenter
103	15:45	*Mathematical Modelling and Numerical Simulations of Underslung Dynamics* K L N Sai Nitish, Kumanan S, Remesh N and Karthik B	K.L.N. Sai Nitish
58	16:00	*Numerical Investigation and Multi-Objective Optimisation of the Aerodynamics of a Hyperloop Pod* Nivedan Vishwanath, Tushar Maloo, Prithvi Ramesh and Dheeraj Agarwal	Nivedan Vishwanath
60	16:15	*Parametric Modelling, Analysis and Design of Compact Diffuser for Heat Exchanger* Kumud Mittal, G. Saravana Kumar, K Arul Prakash, Sreenivas Jayanti and Vengadesan S	Kumud Mittal
8	16:30	*Optimization of Blunt Nose Semi-Spherical Heat-Shield in Hypersonic Flow at Mach 7.99* Chandan Kumar and Akshay Prakash	Chandan Kumar

S1T3: Aircraft Design 1 **Chair: Dr. Ravi Salagame**

ID	Time	Title	Presenter
123	15:45	*Design and Position Sensitivity Analysis of Close-Coupled Canard for Naval Fighter Aircraft* Sathish Sunnam, Muthuraj C and Ragul Selvaraj	Sathish Sunnam
102	16:00	*Sensitivity analysis and optimization for a trainer aircraft configuration* Subrahmanya M B, Suman V K, Kaushik K N, Raghavendra Rao S and Gopinath L	Subrahmanya M B
117	16:15	*Winglet Aerodynamic Optimization of a 19-Seater Turboprop Aircraft* Niranjanan C. K., Arshad Shameem, Shikhar Jaiswal A. and Venkatesh T. N.	Niranjanan C.K.
105	16:30	*A genetic algorithm based optimization of a generic winglet* Suman V K, Abhijit J Patil, Subrahmanya M B, Kaushik K N, Sintu Singha, Raghavendra, Abhay Pashilkar and Ramesh V R	Suman V K

S1T4: Space　　　　　　　　　　　　　　　　　　　**Chair: Dr. Pankaj Priyadarshi**

ID	Time	Title	Presenter
42	15:45	*Analysis of Direct Interplanetary Transfers using Solar-Electric Propulsion* Suchismita Choudhury, Pooja Dutt, Deepak Negi, Abhay Kumar and V. Ashok	Suchismita Choudhury
101	16:00	*On-Off Control Scheme using Reaction Control Thrusters for Pitch Stability during Atmospheric Abort of Crew Module* Swetha Sakunthala, Aprameyo Roy, Nikunj Gupta, Rekhanshi Varma and Kapil Kumar Sharma	Swetha Sakunthala
76	17:15	*Optimal Impulsive Maneuver Planning for Station Acquisition of Geosynchronous Satellites* Srivatsa M R, Gurpreet Singh	Srivatsa M R
121	16:30	*GTOC X: Karmarkar's Gang's Approach and Results* Aniket Bhushan, Vishesh Vatsal, Sri Anish Vutukuri, C Barath and Avijit Bannerji	Vishesh Vatsal

Session 2

Day:	Friday – 8 October 2021
Time:	16:45 – 17:15

S2T1: Structures 1   **Chair: Prof. Sayan Gupta**

ID	Time	Title	Presenter
82	16:45	*Design and Development of a Mechanism to avoid Structural Failure of components for the Rotary Rake System* Devendra Badgujar, Nagesh Chougule and Krishna Ghatge	Devendra Badgujar
71	17:00	*Prediction of the propagation of the fatigue cracks for a beam specimen in four-point bending using CASCA and FRANC2D* Vishwanatha H M, Pawan Kumar, Anshuman Das, Ashish Agrawal, Ch. Sateesh Kumar and B B Verma	Pawan Kumar

S2T2: 3DP   **Chair: Dr. Srinivas Gunti**

ID	Time	Title	Presenter
38	16:45	*Optimization of Fused Filament Fabrication for maximum stiffness considering anisotropy* Rahul Ramachandran and Gurunathan Saravana Kumar	Rahul Ramachandran
53	17:00	*DMLS support structure optimization using homogenized model distortion prediction.* Varun A and G Saravana Kumar	Varun Anand

S2T3: Fluids 1   **Chair: Prof. Abdus Samad**

ID	Time	Title	Presenter
44	16:45	*To Evaluate the Performance of Cooling Tower using different filters* Rutuja Kapote, Kumar Vivek and Ajit Dorwat	Rutuja Kapote, Kumar Vivek
75	17:00	*Lean Supercharging System For a Single Cylinder SI Engine For Improved Fuel Efficiency And Reduced Emissions* Harishankar S, Rajesh T N and Vishnu Asok	Harishankar S

S2T4: TO 1   **Chair: Prof. P. Pradeep Pratapa**

ID	Time	Title	Presenter
55	16:45	*Simulation of integrated starter generator using field-oriented control of BLDC motor with single shunt reconstruction topology* Sushant S Patil, Debrup S Biswas, Hariprasad M Veldoj and Sumanta Kumar R Mohanty	Sushant S Patil
64	17:00	*A Parametric Study on the Convergence Behaviour of SIMP-Based Structural Topology Optimization using GPU* Subhajit Sanfui, Shashi Kant Ratnakar and Deepak Sharma	Subhajit Sanfui

Session 3

Day:	Friday – 8 October 2021
Time:	20:30 – 21:00

S3T1: Structures 2   **Chair: Prof. Ratnakumar A**

ID	Time	Title	Presenter
21	20:30	*Adaptable and Robust Origami Metamaterials with Controllable Poisson's Ratio over Large Deformations* Siva Poornan Vasudevan and Phanisri Pradeep Pratapa	Siva Pooran Vasudevan
81	20:45	*Effect of Patch length on Fatigue life of Pre-cracked aircraft panel Al 6061-T6 repaired with Carbon Fiber patches* Nikhil Sonawane, Prashant Kumar, Hanmant Shinde and Prakash Shinde	Nikhil Sonawane

S3T2: UQ/Statistics 1   **Chair: Mr. Vinay Ramnath**

ID	Time	Title	Presenter
23	20:30	*A State Estimation, Kalman Filter Auto-tuning and Uncertainty Quantification Framework with application to Industrial Storage Tank-farms* Shirish Nanda Potu, Rihab Abdul Razak and Senthil K Vadivelu	Shirih Nanda Potu
118	20:45	*New Regularization for Under-determined System for least square based Polynomial Chaos* Achyut Paudel, Subham Gupta, Mishal Thapa, Sameer B. Mulani and Robert W. Walters	Achyut Paudel

S3T3: TO 2   **Chair: Prof. G K Ananthasuresh**

ID	Time	Title	Presenter
39	20:30	*Topology Optimization of Thermo-Mechanical System with Stress Constraint* Akash H Kapase and Salil S. Kulkarni	Akash H Kapase
51	20:45	*Topology Optimization of a Coupled Aerothermoelastic System* Pankil N Mishra and Abhijit Gogulapati	Abhijit Gogulpati

S3T4: Manufacturing 1   **Chair: Prof. Ramanathan**

ID	Time	Title	Presenter
63	20:30	*Design optimization of Nd:YAG laser welded Inconel718 alloy joints by Taguchi method* Thejasree P and Krishnamachary P C	Thejasree P
67	20:45	*Process Parameters Investigation for Joining of AISI 410 and AISI 316L Dissimilar Metals* Rajesh Patil, Ankit Saraf, Amit Jadhav and Abhishek Hudge	Abhishek Hudge

DAY 3

Session 4

Day:	Saturday – 9 October 2021
Time:	15:00 – 16:00

S4T1: UQ/Statistics 2 **Chair: Prof. Sayan Gupta**

ID	Time	Title	Presenter
98	15:00	*iSOM enabled targeted sampling for tail modelling* Deepanshu and Palaniappan Ramu	Deepanshu
50	15:15	*Optimization of Outlet Comp Ventilator* Hari Krishna, Vipul Gupta and Nirbhay Kr Singh	Hari Krishna
52	15:30	*A Methodology for Multi-objective Multi-disciplinary Design Optimization (MMDO) of Automotive Transmission Systems* Srinivas Gunti, Bonda Veerababu, Saurabh Kamat, Boita Dhananjayarao and Shankar Venugopal	Saurabh Kamat
48	15:45	*Extension of Particle Swarm Optimization Algorithm for Solving a Priority Based Time Minimization Transportation Problem* Gurwinder Singh, Amarinder Singh and Prabhjot Kaur	Gurwinder Singh
56	16:00	*A Comparative Study of ZCD And Extended Kalman filter based Sensorless Control Technique for BLDC Motor* Sushant S Patil, Debrup S Biswas, Hariprasad M Veldoj and Sumanta Kumar R Mohanty	Debrup S Biswas

S4T2: Surrogates **Chair: Mr. Vinay Ramnath**

ID	Time	Title	Presenter
104	15:00	*Differential Evolutionary (DE) method for Strut Performance Design and Optimization Using Machine Learning based Meta-models Prediction* Balasubramanian Shunmugham, Arun Shanthkumar Bhaire, Sritharan Gopal and Fan Li	Balasubramanian Shunmugham
80	15:15	*Surrogate Modelling of the Retaining Ring Shrink-fit in a Turbogenerator* Abhishek Sharma, Aditi Khandelwal and Rishi Relan	Abhishek Sharma
22	15:30	*Design and Optimization of Bio-inspired Fluidic Diode for Wave Energy Harvesting system* Hithaish Doddamani and Samad Abdus	Hithaish Doddamani
91	15:45	*Response Surface Optimization of a Gas turbine Combustor* Navin Mahto and S.R. Chakravarthy	Navin Mahto

S4T3: Structures 3 **Chair: Prof. Saravana Kumar**

ID	Time	Title	Presenter
86	15:00	*Modal analysis and vibration monitoring of cutting tool support structure* Omkar Vilasrao Jadhav and Ajay Bhattu	Omkar Vilasrao Jadhav
99	15:15	*Synthesis and Fatigue Life Optimization of a Spring-less Compliant Robot Leg Design* Rohan Vijay Khatavkar and Ajay Pandit Bhattu	Rohan Vijay Khatavkar
7	15:30	*Early-Stage Local Damage Size Quantification using Nonlinear Wave Mixing* Pravinkumar Ghodake	Parvinkumar Ghodake
13	15:45	*Improvement of vehicle crashworthiness by Polyurethane Foam as a highly efficient energy absorber in the Side Impact Crash* Rajesh V Patil, Abhishek M. Thote, Amit Jadhav and Ankit Saraf	Ankit Saraf

S4T4: MDO 1   **Chair: Dr. Ravi Salagame**

ID	Time	Title	Presenter
112	15:00	*Optimization of Oil Cooler Duct Shape of a Generic Transport Aircraft Using Numeca* Shikhar Jaiswal A, Niranjanan C K and T N Venkatesh	Shikhar Jaiswal A.
110	15:15	*Design of an optimized integrated control computer for conversion of a legacy manned aircraft into OPA/UAV* Gargi Meharu, Dr Rajesh A K, Bimal Vinod, Arjoon KS, Rajesh NR and Vijay K Tripathi	Gargi Meharu
107	15:30	*Multiobjective Multidisciplinary Design Optimization of Pumpkin Shaped Inflatable Aerodynamic Decelerator for Launch Vehicle Stage Recovery* Mayank Gomekar and Pankaj Priyadarshi	Mayank Gomekar
79	15:45	*Multidisciplinary Design Optimization (MDO) of a Typical Civil Aircraft Wing using 3DEXPERIENCE Platform from Dassault Systemés* Umashankar G, Dr. Abhay Pashilkar, Dayanidhi Panda, Srikrishna Srinivasa Chittur, Pankaj A C, Bharath Kanaparthi, Emlin Vathsalan, Ganesh Prasad, Geetha Avula, Devendra Singh and Dr. Vijayakrishnan	Bharath Kanaparthi

Session 5

Day:	Saturday – 9 October 2021
Time:	16:15 – 17:15

S5T1: Materials   **Chair: Prof. Ratnakumar A**

ID	Time	Title	Presenter
12	16:15	*Optimization and prediction of Transverse shear modulus of the bioinspired cell core using PSO and ANN* Muthukumaran Gunasegeran and Edwin Sudhagar P	Muthukumaran gunasegeran
31	16:30	*Design of Composite Pressure Vessel by ASME-X* Nikhil Niteen Berde, Dr. Sudarshan B Sanap, Dr. Sandeep G Thorat and Nitin Nevgi	Nikhil Berde
14	16:45	*Experimental Investigation of AISI 410 and AISI 310 Dissimilar Metal Weld for Engine Exhaust system* Rajesh V Patil, Amit Jadhav, Ankit Saraf and Abhishek Hudge	Amit Jadhav
87	17:00	*Parametric Study of Length and Thickness of the Symmetrically Bonded CFRP Patches used to Repair Pre-Crack Aluminium Specimen* Sagar Shinde, Hanmant Shinde, Prashant Kumar and Prakash Shinde	Sagar Shinde

S5T2: TO 3   **Chair: Prof. G K Ananthasuresh**

ID	Time	Title	Presenter
34	16:15	*Optimization of Aluminium extrusion battery side rail for crashworthiness* Rajapandian Ramamoorthy, Sriram Seshadri, Gaurav R Kanvinde and Tejas Bhavsar	Sriram Seshadri
59	16:30	*Topology optimization for designing a wheel rim* Pilla Sai Priyatham, Dheeraj Agarwal and Amit Kumar Gupta	Pilla Sai Priyatham
70	16:45	*Topology optimization with orthotropic material model for design-dependent loads* Rahul Ramachandran, Sourav Rakshit and Gurunathan Saravana Kumar	Rahul Ramachandran
96	17:00	*Lattice topology optimization of hip bone microstructure* Rajaraman S and Sourav Rakshit	Rajaraman S

S5T3: SC   **Chair: Prof. R K Amit**

ID	Time	Title	Presenter
24	16:15	*Supply chain optimization for mainstreaming SAF in the Indian aviation sector* Arvind Ravi, Shirish Potu, Stephen Varghese, Valliappan Valliappan and Vishwanath Doddamani	Arvind Ravi
26	16:30	*Optimization of Lot Size in Lubricant Blending Plants* Gauri Shanker G R, Ramya C Sreeram, Michael Mortlock and Danielle Zennemers	Gauri Shanker G R
25	16:45	*Strategic Optimization of Lubricant Base Oil Formulations & Supply Portfolio* Senthil Kumar Vadivelu, Gauri Shanker G R, Sudarshan Kasthurirangan and Ben Bosmans	Senthil Vadivelu

S5T4: MDO 2   **Chair: Prof. Abhijit Gogulapathi**

ID	Time	Title	Presenter
88	16:15	*A Methodology for Multi-objective Design Optimization (MDO) of Automotive Suspension System* Ganesh Lingadalu, Srinivas Gunti, Nizampatnam Balaramakrishna and Shankar Venugopal	Srinivas Gunti
106	16:30	*Multi-Disciplinary Analysis and Design Optimization of a Partially Rigidized Parachute* Pankaj Priyadarshi, Kshitij Sunil, Ishan Johri and Leya Joseph	Kshitij Sunil
77	16:45	*Assessment of non-linear optimization algorithms on weighted least-square based method for re-entry prediction* Pooja Dutt, Deepak Negi, Abhay Kumar and V. Ashok	Pooja Dutt

Session 6

Day: Saturday – 9 October 2021

Time: 20:30 – 21:00

S6T1: Aircraft Design 2   **Chair: Dr. Pankaj Priyadarshi**

ID	Time	Title	Presenter
116	20:30	*External Aerodynamic Optimization of a 19-Seater Turboprop Aircraft During Preliminary Design Stage* Niranjanan C. K., Shikhar Jaiswal A, Raghavendra and Venkatesh T. N.	Niranjanan C.K.
45	20:45	*A Multi-fidelity Aeroelastic Optimization of an Aircraft Wing using Co-Kriging* Partha Ajit Surve, Palaniappan Ramu and Devendra Ghate	Partha Ajit Surve

S6T2: Fluids 2   **Chair: Prof. Abdus Samad**

ID	Time	Title	Presenter
19	20:30	*Design Exploration of a Scramjet Inlet upto Three External Ramp* Kunal Garg, Vidya G, M M Patil and Ashok V	Kunal Garg
54	20:45	*Optimization of Scramjet Combustion Efficiency using OpenFOAM* Singeetham Pranaykumar, Kanishque Kumar and Akshay Prakash	Singeetham Pranaykumar

S6T3: Structures 4   **Chair: Dr. Srinivas Gunti**

ID	Time	Title	Presenter
73	20:30	*Systems and Methods for automation of layout generation for automotive transmission graphs* Henri Karhula, Mike Nicolai, Akshobhya, Vinay Ramanath and Abhay Kumar	Abhay Kumar
10	20:45	*Topology Optimization of Vehicle Components for Non linear loadcases* Rajapandian Ramamoorthy	Rajapandian Ramamoorthy

S6T4: Manufacturing 2   **Chair: Prof. R K Amit**

ID	Time	Title	Presenter
41	20:30	*Investigations on the Machining of Inconel X-750: Effect of Cutting Speed, Feed, Forces, Energy Consumption and MRR* Vishal Y. Bhise and Bhagwan F Jogi	Vishal Y. Bhise
57	20:45	*Application of Evolutionary Teaching-Learning based Optimization (TLBO) in Wire Electro discharge Turning* Raju Pawade, Nikhil Khatekar and Rohit Wakade	Nikhil Khatekar