European Community on
Computational Methods in
Applied Sciences

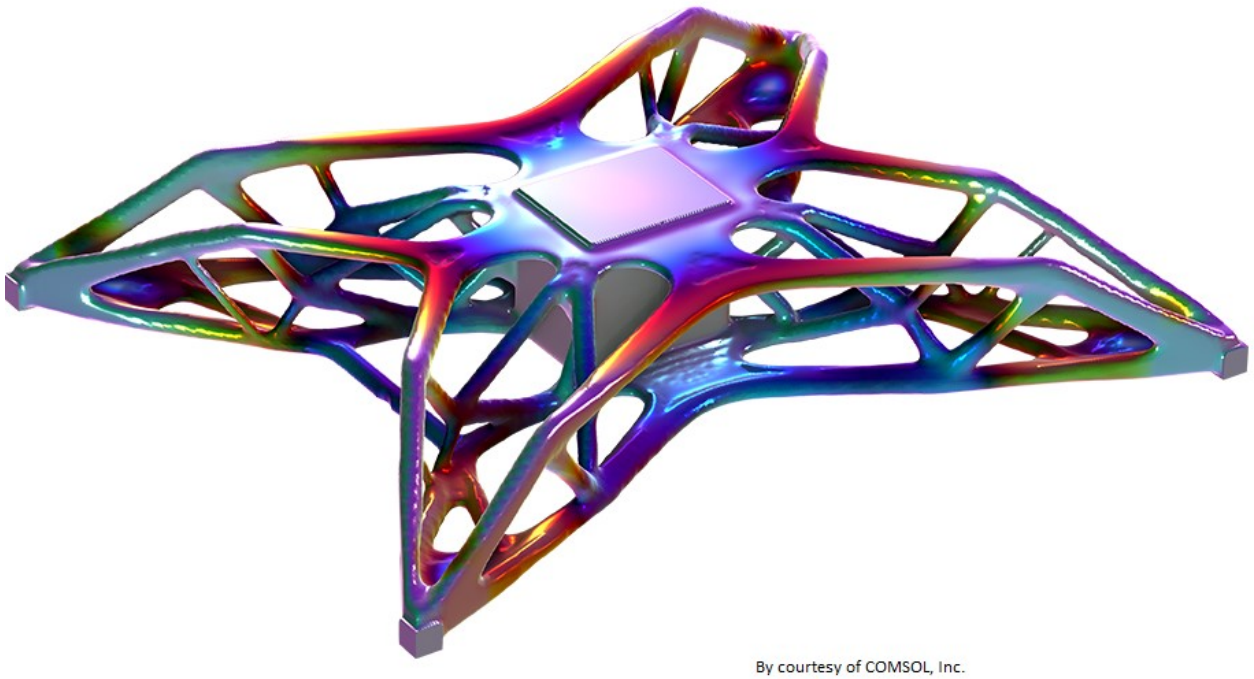
ECCOMAS

1-3 June, Chania, Crete, Greece

EUROGEN 2023

15th INTERNATIONAL CONFERENCE ON EVOLUTIONARY AND DETERMINISTIC METHODS FOR DESIGN, OPTIMIZATION AND CONTROL

PROGRAMME



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Conference Secretariat:
Institute of Structural Analysis and Antiseismic Research
National Technical University of Athens, Greece

EUROGEN 2023

15th International Conference on Evolutionary and Deterministic Methods for Design, Optimization and Control

An ECCOMAS Thematic Conference

Chania, Crete, Greece
1-3 June 2023

Programme

Institute of Structural Analysis and Antiseismic Research
School of Civil Engineering
National Technical University of Athens

PROGRAMME OVERVIEW

WEDNESDAY, MAY 31	
18:00 - 20:00	**REGISTRATION**
20:00 - 21:00	**WELCOME RECEPTION** *Tholos Pool Bar, Minoa Palace Hotel*

DAY 1 - THURSDAY, JUNE 1		
Time	**Athina I**	**Athina II**
8:00 - 8:45	**REGISTRATION**	
9:00 - 9:15	**OPENING**	
9:15 - 10:45	**PLENARY LECTURES I** **Kai-Uwe Bletzinger** **Thomas Rung**	
10:45 - 11:15	**Coffee Break**	
11:15 - 13:15	**TECHNICAL SESSIONS**	
	MS 6 - I ADJOINT METHODS, INCL. MULTI-FIDELITY APPROACHES, FOR MDO IN AEROSPACE APPLICATIONS	**MS 7 - I** FUTURE COMPUTATIONAL NEEDS FOR A CLIMATE NEUTRAL AVIATION: ADVANCED DESIGN METHODS, OPTIMISATION TOOLS AND DISRUPTIVE CONCEPTS
13:15 - 14:15	**Lunch Break**	
14:15 - 15:00	**PLENARY LECTURES II** **Gabriel Bugeda**	
15:00 - 15:45	**PLENARY LECTURES III** **Rauno Cavallaro**	
15:45 - 16:15	**Coffee Break**	
16:15 - 18:15	**TECHNICAL SESSIONS**	
	MS 4 - I MACHINE LEARNING AND DATA-DRIVEN APPROACHES FOR OPTIMIZATION AND UNCERTAINTY QUANTIFICATION IN AERODYNAMICS	**TS 21 - I** MULTIDISCIPLINARY, MULTIPHYSICS AND MULTI-OBJECTIVES AND MULTI-CRITERIA OPTIMIZATION METHODS

DAY 2 - FRIDAY, JUNE 2		
Time	**Athina I**	**Athina II**
9:00 - 11:00	**TECHNICAL SESSIONS**	
	MS 6 - II ADJOINT METHODS, INCL. MULTI-FIDELITY APPROACHES, FOR MDO IN AEROSPACE APPLICATIONS	**TS 28 - I** SHAPE AND TOPOLOGY OPTIMIZATION
11:00 - 11:30	**Coffee Break**	
11:30 - 13:00	**PLENARY LECTURES IV** **Oren Lavan** **Julián Norato**	
13:00 - 14:15	**Lunch Break**	
14:15 - 15:00	**PLENARY LECTURES V** **Joël Brezillon**	
15:00 - 17:00	**TECHNICAL SESSIONS**	
	MS 4 - II MACHINE LEARNING AND DATA-DRIVEN APPROACHES FOR OPTIMIZATION AND UNCERTAINTY QUANTIFICATION IN AERODYNAMICS	**MS 7 - II** FUTURE COMPUTATIONAL NEEDS FOR A CLIMATE NEUTRAL AVIATION: ADVANCED DESIGN METHODS, OPTIMISATION TOOLS AND DISRUPTIVE CONCEPTS
18:30 - 22:30	**Chania city tour & Banquet**	

DAY 3 - SATURDAY, JUNE 3		
Time	**Athina I**	**Athina II**
9:00 - 11:00	**TECHNICAL SESSIONS**	
	MS 5 OPTIMIZATION METHODS AND APPLICATIONS IN STRUCTURAL ENGINEERING	**TS 28 - II** SHAPE AND TOPOLOGY OPTIMIZATION
11:00 - 11:30	**Coffee Break**	
11:30 - 13:00	**SEMI - PLENARY LECTURES I** **Jochen Wild** **Evangelos Papoutsis-Kiachagias**	**SEMI - PLENARY LECTURES II** **Michaël Méheut** **Tom Verstraete**
13:00 - 14:00	**Lunch Break**	
14:00 - 16:00	**TECHNICAL SESSIONS**	
	MS 4 - III MACHINE LEARNING AND DATA-DRIVEN APPROACHES FOR OPTIMIZATION AND UNCERTAINTY QUANTIFICATION IN AERODYNAMICS	**TS 21 - II** MULTIDISCIPLINARY, MULTIPHYSICS AND MULTI-OBJECTIVES AND MULTI-CRITERIA OPTIMIZATION METHODS **MS 3** ADVANCES IN SOFT COMPUTING AND OPTIMIZATION METHODS IN ENGINEERING

Conference Venue

Conference Centre Rooms
ATHINA HALL

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Greetings from the Chairpersons

Dear colleagues and friends,

Welcome to the ***XV International Conference on Evolutionary and Deterministic Methods for Design, Optimization and Control (EUROGEN 2023)***.

The conference is organized under the auspices of ECCOMAS, among the 30 ECCOMAS Thematic Conferences organized every two years, which attract more than 3.000 participants in total. ECCOMAS Thematic Conferences have been established as the top scientific events worldwide in the area of computational methods in applied sciences and engineering and are highly anticipated every two years by the international community.

The current edition of EUROGEN, co-chaired by Nicolas Gauger, Kyriakos Giannakoglou, Manolis Papadrakakis and Jacques Periaux, is the 15th of a series of biannual International Conferences, which were initiated by Jacques Periaux in 1995, years before the creation of ECCOMAS Thematic Conferences, devoted to Evolutionary and Deterministic Computing for Industrial Applications. The first conference was held in Las Palmas de Gran Canaria (1995), followed by Trieste (1997), Jyväskylä (1999), Athens (2001), Barcelona in 2003, and from then onwards as ECCOMAS Thematic Conferences in Munich (2005), Jyväskylä (2007), Kracow (2009), Capua (2011), Las Palmas de Gran Canaria (2013), Glasgow (2015) Madrid (2017), Guimaraes (2019) and as an online event (2021).

The EUROGEN Thematic Conference Series acts as a forum for exchanging ideas and for establishing links between research groups with complementary interests and activities. The communities of mathematical programming and nature-inspired search algorithms are involved from different perspectives to address important application challenges with great societal impact, ranging from practical applications in structural, aerospace, mechanical, civil, chemical, naval, and bio-engineering to applied problems in economics, physics and biology.

Welcome to Crete, the largest island of Greece in the Mediterranean, and particularly, to the beautiful city of Chania. Crete has a very long and rich history dating thousands of years, and nowadays is characterized by its high touristic appeal owed to the island's diverse landscape as well as to its unique and colorful culture. The birthplace of Zeus according to the mythology, and home of the Minoan civilization, Europe's first advanced civilization which flourished from 3.500 to 1.100 BC.

The organizers would like to thank the invited speakers for accepting our invitations, the 18 colleagues who have been involved in the organization of the minisymposia, as well as the authors for presenting their contributions.

The scope of the conference and the idyllic location of the venue will offer the perfect blend for scientific endeavor and recreation. Thus, we invite you to enjoy the conference and to experience an unforgettable stay in Crete.

The Conference Co-chairs

Nicolas Gauger	**Kyriakos Giannakoglou**	**Manolis Papadrakakis**	**Jacques Periaux**
TU Kaiserslautern, Germany	*NTUA,* Greece and ERCOFTAC	*NTUA*, Greece and ECCOMAS	CIMNE, *Univ. Jyvaskyla* and ECCOMAS

EUROGEN 2023 COMMITTEES

Scientific Committee

M. Alves, Portugal
C. Antunes, Portugal
V. Asouti, Greece
T. Bäck, The Netherlands
A. T. Beck, Brazil
A. Bekasiewicz, Iceland
G. Bugeda, Spain
E. F. Campana, Italy
C. Coello, Mexico
L. Costa, Portugal
K. Deb, USA
C. Fonseca, Portugal
M. Fragiadakis, Greece
D. Frangopol, USA
A. Gaspar-Cunha, Portugal
N. Gauger, Germany
D. Greiner, Spain
J. Guest, USA
X. Guo, China
C. Hirsch, Belgium
Z. Kang, China
K. Kapania, India
A. Kaveh, Iran
M. Langelaar, Netherlands
B. S. Lazarov, USA
L. Mallozi, Italy
S. Martorell, Spain
M. Meheut, France
K. Miettinen, Finland
E. Minisci, United Kingdom
F. Monge, Spain
S. Nishiwaki, Japan
S. Obayashi, Sweden
G. Papa, Slovenia
P.Y. Papalambros, USA
G. Papoutsis-Kiachagias, Greece
P.M. Pardalos, USA
D. Pasini, Canada
R. Pavanello, Brazil
J. Periaux, Spain
E.A. Perez, Spain
M. Pini, Netherlands
V. Plevris, Qatar
D. Quagliarella, Italy
G. Roge, France
T. Rung, Germany
M.P. Saka, Turkey
M. Shimoda, Japan
J. Sikora, Poland
Z. Tang, China
H. Telib, Italy
J. Tsompanakis, Greece
E. Valero, Spain
T. Yamada, Japan
G. Yoon, Republic of Korea

Chairpersons

N. Gauger, *TU Kaiserslautern*, Germany

K. Giannakoglou, *National Technical University of Athens,* Greece and ERCOFTAC

M. Papadrakakis, *National Technical University of Athens*, Greece and ECCOMAS

J. Periaux, CIMNE, *Univ. Jyvaskyla* and ECCOMAS

Conference Guide

Programme Format

The Technical Programme consists of 6 Plenary Lectures, 6 semi-Plenary Lectures, 5 Minisymposia and 2 Thematic Sessions. In total 72 presentations will take place during the three days of the conference.

Plenary and Semi - Plenary Lecturers

Kai-Uwe Bletzinger
Technical University of Munich, Germany

19122 CREATING FORM BY SHAPE OPTIMIZATION - ABOUT THE STATE OF THE ART OF BULK-SURFACE FILTERING METHODS AND THEIR APPLICATION AS DESIGN TOOLS IN ENGINEERING
Thursday, 9:15-10:45, Athina I

Joël Brezillon
Airbus Operations SAS

19181 HIGH-FIDELITY AERODYNAMIC SHAPE AND MULTI-DISCIPLINARY OPTIMISATION FOR AIRCRAFT DESIGN: A CAPABILITY PERSPECTIVE WITH APPLICATIONS
Friday, 14:15-15:00, Athina I

Gabriel Bugeda
CIMNE, Spain

18996 HYBRID EVOLUTIONARY-DETERMINISTIC OPTIMISATION BASED ON MULTI-PLAYER STRATEGIES
Thursday, 14:15-15:00, Athina I

Rauno Cavallaro
Universidad Carlos III de Madrid, Spain

19002 ON THE IMPACT OF COUPLED AERO-STRUCTURAL OPTIMIZATION ON HIGHLY FLEXIBLE WINGS
Thursday, 15:00-15:45, Athina I

Oren Lavan
Technion - Israel Institute of Technology, Israel

18956 OPTIMAL DESIGN OF COMPLEX AND ADVANCED STRUCTURAL SYSTEMS SUBJECTED TO DYNAMIC LOADINGS
Friday, 9:00-10:30, Athina I

Michaël Méheut
ONERA, France

18947 ROLE OF MDO TOWARDS CLIMATE-NEUTRAL AIRCRAFT
Saturday, 11:30-13:00, Athina II

Julián Norato
University of Connecticut, USA

19000 ADVANCES IN TOPOLOGY OPTIMIZATION WITH GEOMETRIC PRIMITIVES
Friday, 9:00-10:30, Athina I

Evangelos Papoutsis-Kiachagias
National Technical University of Athens, Greece

18987 CONTINUOUS ADJOINT METHODS FOR SHAPE AND TOPOLOGY OPTIMIZATION WITH INDUSTRIAL APPLICATIONS
Saturday, 11:30-13:00, Athina I

Thomas Rung
Hamburg University of Technology (TUHH), Germany

18998 ADJOINT-BASED TECHNIQUES FOR THE MINIMIZATION OF HEMOLYSIS USING NEWTONIAN AND NON-NEWTONIAN BLOOD MODELS
Thursday, 9:15-10:45, Athina I

Tom Verstrate
von Karman Institute for Fluid Dynamics, Belgium

19148 COMPARISON OF DIFFERENT HYBRID OPTIMIZATION METHODS APPLIED TO TURBOMACHINERY TEST CASES
Saturday, 11:30-13:00, Athina II

Jochen Wild
German Aerospace Center, Germany

19080 CFD AND CFD BASED OPTIMIZATION IN AERODYNAMIC HIGH-LIFT DESIGN
Saturday, 11:30-13:00, Athina I

Minisymposia

MS 3: ADVANCES IN SOFT COMPUTING AND OPTIMIZATION METHODS IN ENGINEERING

MS Organizers: Vagelis Plevris, Sadjad Gharehbaghi, Alejandro Jimenez Rios

MS 3: Saturday, 14:00-16:00, Athina II

MS 4: MACHINE LEARNING AND DATA-DRIVEN APPROACHES FOR OPTIMIZATION AND UNCERTAINTY QUANTIFICATION IN AERODYNAMICS

MS Organizer: Esther Andrés Pérez

MS 4 - I: Thursday, 16:15-18:15, Athina I
MS 4 - II: Friday, 15:00-17:00, Athina I
MS 4 - III: Saturday, 14:00-16:00, Athina I

MS 5: OPTIMIZATION METHODS AND APPLICATIONS IN STRUCTURAL ENGINEERING

MS Organizers: Oren Lavan, Michalis Fragiadakis

MS 5: Saturday, 9:00-11:00, Athina I

MS 6: ADJOINT METHODS, INCL. MULTI-FIDELITY APPROACHES, FOR MDO IN AEROSPACE APPLICATIONS

MS Organizers: Kyriakos C. Giannakoglou, Marco Carini, Gilbert Roge

MS 6 - I: Thursday, 11:15-13:15, Athina I
MS 6 - II: Friday, 9:00-11:00, Athina I

MS 7: FUTURE COMPUTATIONAL NEEDS FOR A CLIMATE NEUTRAL AVIATION: ADVANCED DESIGN METHODS, OPTIMISATION TOOLS AND DISRUPTIVE CONCEPTS

MS Organizer: Jacques Periaux

MS 7 - I: Thursday, 11:15-13:15, Athina II
MS 7 - II: Friday, 15:00-17:00, Athina II

Thematic Sessions

TS 21: MULTIDISCIPLINARY, MULTIPHYSICS AND MULTI-OBJECTIVES AND MULTI-CRITERIA OPTIMIZATION METHODS

TS 21 - I: Thursday, 16:15-18:15, Athina II
TS 21 - II: Saturday, 14:00-16:00, Athina II

TS 28: SHAPE AND TOPOLOGY OPTIMIZATION

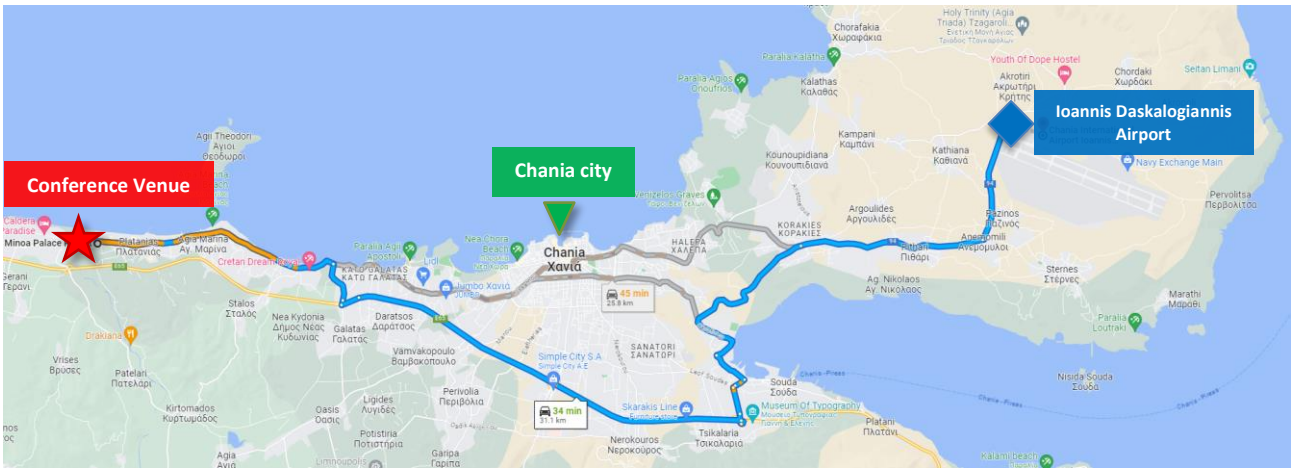
TS 28 - I: Friday, 9:00-11:00, Athina II
TS 28 - II: Saturday, 9:00-11:00, Athina II

Conference Venue

The Conference Venue is the **Minoa Palace Resort Hotel** in **Chania, Crete, Greece.** The "Athina Conference Hall" provides a conference area of 720 m^2, total capacity of 750 persons and exhibition areas of 200 m^2.

Crete Island

Airport to Conference Venue



Transportation

Transfer from and to the Airport: “Ioannis Daskalogiannis” Chania International Airport is located 28 km east side of the Minoa Palace Resort Hotel. “Ioannis Daskalogiannis” Airport is linked directly with “Eleftherios Venizelos” International Airport of Athens with many flights per day (40 minutes). "Ioannis Daskalogiannis" Airport is also connected with regular and charter flights to 50 big cities of Europe and overseas.

Kazantzakis Airport https://www.chq-airport.gr/en

The route from the airport to the Conference venue by taxi takes approximately 30 minutes, while the average cost of the route is 30 €.

City of Chania 15 km from the Conference Venue

Chania is the capital of the prefecture. It is a beautiful town built by the sea and nicely combining old with new traditions that are visible both in its architecture and lifestyle.
A stroll in the Old Town is a like a book on the history of architecture. Venetians, Ottoman Turks, Egyptians developed and influenced the area from the 13th until the 19th century. Today the Old Town’s buildings have been restored and suitably rearranged. The town is lively and buzzing with activity all year round. A multitude of shops, cafebars, modern and traditional restaurants and meze shops attract a lot of local and foreign visitors. There are lots of surprises inside and outside the city. The delicious traditional Cretan cuisine will revitalize the visitor who needs rest, whether it is served in a village cafe, a country tavern or city restaurant. For centuries the locals have been expressing themselves with inspiration and passion.

Important telephone numbers

Emergency Number: 112
Fire Brigade: 199
Police: 100
Ambulance: 166
District Hospital Chania: +30 2821022000, 2821342000
Pharmacies: 14944

Conference Information

Registration and Check in

All attendees are required to check in at the Registration Desks.

Identification Badge

Participants are required to wear badges at all times while in the Conference area.

Secretariat Timetable

Wednesday May 31,	18:00 to 20:00
Thursday June 1,	8:00 to 18:30
Friday June 2,	8:30 to 16:00
Saturday June 3,	8:30 to 16:00

Papers Presentation - Time and Equipment

Most technical sessions will last 2 hours. Typical formats consist of five presentations of 20 minutes each. The allocated time for each presentation includes Q & A.

The Conference will not provide computers for presentation. All presentations will be made with the presenter's laptop computer using LCD projector. You are kindly requested to test your laptop with the projector in your session room during the break preceeding your presentation.

No overhead projectors will be provided; therefore no presentations using transparencies will be possible. We strongly encourage you to have a backup of your presentation in a USB storage device in the event of your laptop has a technical problem or is incompatible with the LCD projector.

Make sure that you have the necessary cords /converters/adapters so that your laptop will work with Greek power outlets CEE 7/4, also called "Schuko" socket and the LCD projector.

Internet Access

Wireless Internet access will be available in the premises of the Conference venue.

Social Events

Welcome Reception:
Wednesday **May 31**, (20:00 to 21:00), Tholos Pool Bar, Minoa Palace Hotel

Conference Dinner & Chania city tour:
Friday **June 2** (18:30 to 22:30), Chania

Accompanying Persons' Programme:
The Accompanying Persons' Programme includes the Welcome Reception and the Conference Dinner

PLENARY LECTURES

Thursday, June 1 **Athina I**
9:15-10:45

Chair: Nicolas Gauger

19122 CREATING FORM BY SHAPE OPTIMIZATION - ABOUT THE STATE OF THE ART OF BULK-SURFACE FILTERING METHODS AND THEIR APPLICATION AS DESIGN TOOLS IN ENGINEERING
***Kai-Uwe Bletzinger**, Reza Najian Asl*

18998 ADJOINT-BASED TECHNIQUES FOR THE MINIMIZATION OF HEMOLYSIS USING NEWTONIAN AND NON-NEWTONIAN BLOOD MODELS
***Thomas Rung**, Georgios Bletsos*

10:45-11:15
Coffee Break

TECHNICAL SESSIONS

Thursday, June 1 **11:15-13:15**	**Athina I**

MS 6 - I: **ADJOINT METHODS, INCL. MULTI-FIDELITY APPROACHES, FOR MDO IN AEROSPACE APPLICATIONS**

MS Organizers: Kyriakos C. Giannakoglou, Marco Carini, Gilbert Roge

Chair: Kyriakos Giannakoglou

18965 THE THINK DISCRETE-DO CONTINUOUS ADJOINT IN AERODYNAMIC SHAPE OPTIMIZATION
***Kyriakos Giannakoglou**, Varvara Asouti, Evangelos Papoutsis-Kiachagias, Nikolaos Galanos, Marina Kontou, Xenofon Trompoukis*

18908 MULTI-PHYSICS SIMULATION AND OPTIMISATION OF A HEAT-EXCHANGER
***Shahrokh Shahpar**, L. Fowler, I. Tristanto, E. Lomardi, Alessandro Alaia*

18925 BIDISCIPLINARY GRADIENT-BASED SHAPE OPTIMIZATION OF A GENERIC AIRCRAFT IN ORDER TO REDUCE DRAG UNDER LOW OBSERVABILITY CONSTRAINTS
***Charles Thoulon**, Gilbert Rogé, Olivier Pironneau*

18920 COMPARISON OF EFFICIENT UNCERTAINTY QUANTIFICATION TECHNIQUES ON A TRANSONIC AIRFOIL, USING RANS COMPUTATIONS AND ADJOINT METHOD
***Quentin Bennehard**, Jacques Peter, Marco Carini*

19017 STRUCTURE OPTIMIZATION FOR IMPROVING AERO-ELASTIC CRUISE PERFORMANCE OF AN AIRCRAFT USING THE ADJOINT APPROACH
Fabian Volle

18932 AN ADJOINT BODY-FORCE APPROACH FOR FULLY-COUPLED AERO-PROPULSIVE OPTIMIZATIONS
***Cyril Dosne**, R. Barrier, Sébastien Bourasseau, Marco Carini, Rocco Moretti, Jacques Peter*

Thursday, June 1 **11:15-13:15**		**Athina II**
MS 7 - I:	**FUTURE COMPUTATIONAL NEEDS FOR A CLIMATE NEUTRAL AVIATION: ADVANCED DESIGN METHODS, OPTIMISATION TOOLS AND DISRUPTIVE CONCEPTS**	
MS Organizer:	Jacques Periaux	
Chair:	Jacques Periaux	
19098	A RADIATIVE TRANSFER SOLVER COUPLED WITH THE NAVIER-STOKES EQUATIONS FOR CONTRAILS OVER AIRPORTS ***Olivier Pironneau***	
19053	MODELLING AND SIMULATION FOR INNOVATIVE AERONAUTIC DEVELOPMENTS ***Jos Vankan****, N. van Hoorn, A.J. de Wit, R. Maas*	
19083	EFFICIENT INDUSTRIAL AERODYNAMIC SHAPE OPTIMIZATION BY COMBINING SOBOLEV METHODS WITH ARBITRARY PARAMETERIZATIONS ***Nicolas R. Gauger****, Stephan Schmidt, Thomas Dick*	
19100	AERO-STRUCTURAL OPTIMIZATION OF TURBOMACHINERY USING AN ADJOINT APPROACH ***Tom Verstraete***	
18825	MICROEXTRUSION OF FILLED POLYPROPYLENE ***Janusz Sikora****, Agnieszka Krząkała*	

13:15-14:15 **Lunch Break**

PLENARY LECTURES

Thursday, June 1 **14:15-15:00**	**Athina I**

Chair: Kai-Uwe Bletzinger

18996 HYBRID EVOLUTIONARY-DETERMINISTIC OPTIMISATION BASED ON MULTI-PLAYER STRATEGIES
***Gabriel Bugeda**, J. Pons-Prats, M. Coma*

Thursday, June 1 **15:00-15:45**	**Athina I**

Chair: Joël Brezillon

19002 ON THE IMPACT OF COUPLED AERO-STRUCTURAL OPTIMIZATION ON HIGHLY FLEXIBLE WINGS
Rauno Cavallaro

15:45-16:15
Coffee Break

TECHNICAL SESSIONS

Thursday, June 1 **Athina I**
16:15-18:15

MS 4 - I: **MACHINE LEARNING AND DATA-DRIVEN APPROACHES FOR OPTIMIZATION AND UNCERTAINTY QUANTIFICATION IN AERODYNAMICS**

MS Organizer: Esther Andrés Pérez

Chair: Esther Andrés Pérez

18872 A NOVEL FRAMEWORK FOR INDUCTION MACHINE PARAMETER IDENTIFICATION
***Gregor Gregorčič**, Thomas Haidinger, Erwin Reisinger*

18886 AN AERODYNAMIC SHAPE DESIGN OPTIMIZATION PROCEDURE BASED ON MACHINE LEARNING
Domenico Quagliarella

18859 PHYSICS-BASED REGULARIZATION OF NEURAL NETWORKS FOR AERODYNAMIC FLOW PREDICTIONS
***Derrick Armando Hines Chaves**, Mateus Dias Ribeiro, Philipp Bekemeyer*

18879 USING MACHINE LEARNING FOR DATA-DRIVEN MODELLING IN THE CONTEXT OF AIRCRAFT AERODYNAMIC CONCEPT DESIGN - A COMPARATIVE STUDY
Olivier Amoignon

18880 GENERALIZATION CAPABILITIES OF CONDITIONAL GAN FOR TURBULENT FLOW UNDER CHANGES OF GEOMETRY
***Claudia Drygala**, Francesca di Mare, Hanno Gottschalk*

Thursday, June 1 **Athina II**
16:15-18:15

TS 21 - I: **MULTIDISCIPLINARY, MULTIPHYSICS AND MULTI-OBJECTIVES AND MULTI-CRITERIA OPTIMIZATION METHODS**

Chair: Yoshiaki Abe

18845 MULTI-MODAL FULLY PARTITIONED METHOD FOR THE STATIC AEROELASTIC ANALYSIS OF COMPOSITE AIRCRAFT WINGS
*Tomoki Yamazaki**, Yoshiaki Abe**, Shugo Date, Tomonaga Okabe, Shigeru Obayashi*

18861 REDUCING THE NUMBER OF OBJECTIVES FOR MANY-OBJECTIVES OPTIMIZATION: EMPIRICAL ANALYSIS OF A MACHINE LEARNING APPROACH
***António Gaspar-Cunha**, Paulo Costa, Francisco Monaco, Alexandre Delbem*

18875 DEVELOPMENT OF DESIGN OPTIMISATION TECHNIQUES FOR COMPUTATIONALLY EXPENSIVE MODELLING PROCESSES
***Ben Smith**, Benjamin Evans, Sean Walton, Martin Dodds*

18945 MULTI-OBJECTIVE LATTICE STRUCTURE DESIGN BASED ON MACHINE LEARNING
***Ajit Panesar**, Jier Wang*

18951 ON IMPORTANCE OF VARIOUS PULLEYS IN FINGER FLEXOR TENDON BIOMECHANICS VIA A COMPUTATIONAL MODEL
***Vitthal Khatik**, Shyam Sunder Nishad, Anupam Saxena*

TECHNICAL SESSIONS

Friday, June 2 **9:00-11:00**	**Athina I**

MS 6 - II: **ADJOINT METHODS, INCL. MULTI-FIDELITY APPROACHES, FOR MDO IN AEROSPACE APPLICATIONS**

MS Organizers: Kyriakos C. Giannakoglou, Marco Carini, Gilbert Roge

Chair: Marco Carini

18949 AN ADJOINT-BASED, PARAMETERIZATION-FREE FRAMEWORK FOR AERODYNAMIC SHAPE OPTIMIZATION IN OPENFOAM
***Evangelos Papoutsis-Kiachagias**, Kyriakos Giannakoglou*

18930 THE NEXTAIR PROJECT: AN OVERVIEW OF CHALLENGES AND OBJECTIVES
Marco Carini

18969 APPLICATION OF AERO-STRUCTURAL WING DESIGN UNDER HIGH-FIDELITY BASED LONGITUDINAL STATIC STABILITY CONSTRAINTS
***Mohammad Abu-Zurayk**, Stefan Görtz*

18946 TOWARDS REAL-TIME CFD
***Anirudh Rao**, Sina Stapelfeldt, Andrew Duncan, Shahrokh Shahpar, Francesco Montomoli*

18952 HYDRODYNAMIC OPTIMIZATION OF ACTIVELY DEFORMING FLAPPING-FOIL THRUSTERS FOR AUV PROPULSION
***Dimitra Anevlavi**, Evangelos Filippas, Kostas Belibassakis*

Friday, June 2 **Athina II**
9:00-11:00

TS 28 - I: SHAPE AND TOPOLOGY OPTIMIZATION

Chair: Niclas Strömberg

18928 A GAME FOR MULTI-SCALE TOPOLOGY OPTIMIZATION OF STATIC AND DYNAMIC COMPLIANCES OF TPMS-BASED LATTICE STRUCTURES
Niclas Strömberg

19045 MAXIMIZATION OF DAMPING ENERGY DISSIPATION USING TOPOLOGY OPTIMIZATION WITH DISCRETE VARIABLES CONSIDERING TRANSIENT LOADS
Lidy Marcela Anaya Jaimes*, Jarir Mahfoud, Renato Pavanello*

18839 OPTIMISATION OF A NOVEL DUCTED WINGLET ON A WIND TURBINE BLADE FOR REDUCED WAKE
Jakub Vincalek*, Sean Walton, Ben Evans*

18870 RISK-AVERSE SHAPE OPTIMIZATION IN APPLICATIONS OF BIOMEDICAL FLUID DYNAMICS
Georgios Bletsos*, Alexander Mainka, Winnifried Wollner, Thomas Rung*

11:00-11:30
Coffee Break

PLENARY LECTURES

Friday, June 2 **Athina I**
11:30-13:00

Chair: Zhen Luo

18956 OPTIMAL DESIGN OF COMPLEX AND ADVANCED STRUCTURAL SYSTEMS SUBJECTED TO DYNAMIC LOADINGS
Oren Lavan

19000 ADVANCES IN TOPOLOGY OPTIMIZATION WITH GEOMETRIC PRIMITIVES
Julián Norato

13:00-14:15
Lunch Break

PLENARY LECTURES

Friday, June 2 **Athina I**
14:15-15:00

Chair: Yiannis Tsompanakis

19181 HIGH-FIDELITY AERODYNAMIC SHAPE AND MULTI-DISCIPLINARY OPTIMISATION FOR AIRCRAFT DESIGN: A CAPABILITY PERSPECTIVE WITH APPLICATIONS
Joël Brezillon

TECHNICAL SESSIONS

Friday, June 2 **15:00-17:00**	**Athina I**

MS 4 - II: **MACHINE LEARNING AND DATA-DRIVEN APPROACHES FOR OPTIMIZATION AND UNCERTAINTY QUANTIFICATION IN AERODYNAMICS**

MS Organizer: Esther Andrés Pérez

Chair: Gregor Gregorčič

18940 A COMPARISON OF MACHINE LEARNING APPROACHES FOR AERODYNAMIC SHAPE DESIGN OPTIMIZATION
***Alessandro Alaia**, Domenico Quagliarella, Angelo Iollo, Tommaso Taddei, Haysam Telib*

18964 DNN-ASSISTED EA-BASED SHAPE OPTIMIZATION OF A HYDRAULIC TURBINE
*Marina Kontou**, Varvara Asouti**, Xenofon Trompoukis, Kyriakos Giannakoglou*

18882 MULTI-FIDELITY AERODYNAMIC DESIGN OPTIMIZATION FRAMEWORK USING GRADIENT ASSISTED SURROGATE MODELING
*Emre Özkaya, **Jan Rottmayer**, Nicolas Gauger*

18885 NON-LINEAR SURROGATE MODEL DESIGN FOR AERODYNAMIC DATASET GENERATION
***Guillermo Suarez**, Emre Özkaya, Nicolas R. Gauger, Hans-Joerg Steiner, Michael Schaefer, David Naumann*

18887 TOWARDS AERODYNAMIC SHAPE OPTIMISATION BY MANIFOLD LEARNING AND NEURAL NETWORKS
***Rodrigo Castellanos**, Javier Nieto-Centenero, Alejandro Gorgues, Stefano Discetti, Andrea Ianiro, Esther Andrés*

Friday, June 2 **15:00-17:00**		**Athina II**
MS 7 - II:	**FUTURE COMPUTATIONAL NEEDS FOR A CLIMATE NEUTRAL AVIATION: ADVANCED DESIGN METHODS, OPTIMISATION TOOLS AND DISRUPTIVE CONCEPTS**	
MS Organizer:	Jacques Periaux	
Chair:	Olivier Pironneau	
19061	COOPERATIVE CONCURRENT DESIGN OPTIMIZATION OF A KRUEGER HIGH-LIFT SYSTEM ***Jochen Wild**, Domenico Quagliarella*	
19102	NON-PARAMETRIC TURBINE BLADE TIP SHAPING USING ADJOINT OPTIMISATION ***Ning Qin**, Guo Ye*	
19104	FREEFEM A NUMERICAL TOOLS FOR ADVANCED DESIGN METHODS, OPTIMISATION ***Frederic Hecht***	
19106	A EVALUATION OF DATA DRIVEN, MODAL DECOMPOSITION METHODS, AND THEIR APPLICATIONS TO INDUSTRIAL PROBLEMS ***Eusebio Valero***	
19108	AN EFFICIENT HYBRID EVOLUTIONARY OPTIMIZATION METHOD COUPLING CULTURAL ALGORITHM WITH GENETIC ALGORITHMS AND ITS APPLICATION TO AERODYNAMIC SHAPE DESIGN ***Xin Zhao,** Zhili Tang, Fan Cao, Caicheng Zhu, Jacques Periaux*	
18935	ANALYSIS AND OPTIMIZATION OF PEM FUEL CELLS USING OPENFOAM ***Morteza Monfaredi**, Evangelos Papoutsis-Kiachagias, Varvara Asouti, Kyriakos Giannakoglou*	

TECHNICAL SESSIONS

Saturday, June 3	**Athina I**
9:00-11:00	

MS 5: **OPTIMIZATION METHODS AND APPLICATIONS IN STRUCTURAL ENGINEERING**
MS Organizers: Oren Lavan, Michalis Fragiadakis
Chair: Michalis Fragiadakis

18959 MULTI-OBJECTIVE OPTIMIZATION OF LIQUID STORAGE TANKS EQUIPPED WITH A HYBRID SEISMIC ISOLATION SYSTEM
*Alexandros Tsipianitis**, Yiannis Tsompanakis***

18850 OPTIMIZATION OF FLUID VISCOUS DAMPERS FOR SEISMIC RETROFITTING BY OUTER APPROXIMATION
Nicolò Pollini

18858 OPTIMAL DESIGN OF FOOTBRIDGES USING ADVANCED TECHNOLOGIES FOR IMPROVING THE DYNAMIC RESPONSE
***Nir Itzhak Ben-Israel**, Oren Lavan*

18911 A NEW BIO-INSPIRED PRINCIPLE FOR SHAPE OPTIMIZATION TO IMPROVE STRUCTURAL RESISTANCE
***Chunmei Liu**, Eduardo Souza de Cursi, Renata Troian*

18943 A MULTIOBJECTIVE APPROACH FOR SURROGATE MODELLING OF SKELETAL METALLIC FRAMES WITH ARTIFICIAL NEURAL NETWORKS
*David Greiner, **Nestor Lopez***

19153 DATABASE EXPLORATION AND GROUND MOTION RECORD SELECTION USING OPTIMIZATION ALGORITHMS
***Michalis Fragiadakis**,, Manolis Georgioudakis*

18856 OPTIMIZATION-BASED SEISMIC DESIGN OF FRAMES WITH SELF-CENTERING CONNECTIONS
***Ohad Idels**, Oren Lavan*

Saturday, June 3 **Athina II**
9:00-11:00

TS 28 - II: SHAPE AND TOPOLOGY OPTIMIZATION

Chair: Niclas Strömberg

18981 A GRADIENT DESCENT AKIN METHOD FOR INEQUALITY CONSTRAINED OPTIMIZATION: ALGORITHMS AND APPLICATIONS
***Long Chen**, Kai-Uwe Bletzinger, Nicolas R. Gauger, Yinyu Ye*

18876 AGGREGATION-FREE FATIGUE CONSTRAINED TOPOLOGY OPTIMIZATION USING THE CONSTRAINED NATURAL ELEMENT METHOD
***Yanda Chen**, Eric Monteiro, Imade Koutiri, Véronique Favier*

18921 VOLUME CONSERVING BOUNDARY SMOOTHING FOR 2D TOPOLOGY OPTIMIZATION SOLUTIONS
***Nikhil Singh**, Anupam Saxena*

18918 TOPOLOGY OPTIMIZATION FOR TWO-PHASE FLUID
Gil Ho Yoon

18926 A MULTI-SCALE TOPOLOGY OPTIMIZATION APPROACH WITH IMPLICIT FUNCTION-BASED MICRO-STRUCTURES
***Andrea Nale**, Andrea Chiozzi*

11:00-11:30
Coffee Break

SEMI - PLENARY LECTURES

Saturday, June 3 **Athina I**
11:30-13:00

Chair: Kyriakos Giannakoglou

19080 CFD AND CFD-BASED OPTIMIZATION IN AERODYNAMIC HIGH-LIFT DESIGN
Jochen Wild

18987 CONTINUOUS ADJOINT METHODS FOR SHAPE AND TOPOLOGY OPTIMIZATION WITH INDUSTRIAL APPLICATIONS
Evangelos Papoutsis-Kiachagias*, Kyriakos Giannakoglou*

Saturday, June 3 **Athina II**
11:30-13:00

Chair: Jacques Periaux

18947 ROLE OF MDO TOWARDS CLIMATE-NEUTRAL AIRCRAFT
Michaël Méheut

19148 COMPARISON OF DIFFERENT HYBRID OPTIMIZATION METHODS APPLIED TO TURBOMACHINERY TEST CASES
Tom Verstraete

13:00-14:00
Lunch Break

TECHNICAL SESSIONS

Saturday, June 3 **Athina I**
14:00-16:00

MS 4 - III: **MACHINE LEARNING AND DATA-DRIVEN APPROACHES FOR OPTIMIZATION AND UNCERTAINTY QUANTIFICATION IN AERODYNAMICS**
MS Organizer: Esther Andrés Pérez
Chair: Igor Averbakh

18944 NETWORK RESTORATION PROBLEMS
Igor Averbakh

19076 A METHODOLOGY TO CHARACTERIZE AN OPTIMAL ROBOTIC MANIPULATOR FOR SELECTIVE SPRAYING IN VINEYARDS
Roni Azriel*, Avital Bechar*

18890 FUSING AERODYNAMIC DATA USING MULTI-FIDELITY GAUSSIAN PROCESS REGRESSION
Javier Nieto-Centenero*, Rodrigo Castellanos, Alejandro Gorgues, Esther Andrés*

18902 SCALABLE CLUSTERED ACTIVE SUBSPACES FOR KRIGING REGRESSION IN HIGH DIMENSION
Maxime Chapron*, Christophe Blondeau, Michel Bergmann, Itham Salah el Din, Denis Sipp*

Saturday, June 3 **Athina II**
14:00-16:00

TS 21 - II: **MULTIDISCIPLINARY, MULTIPHYSICS AND MULTI-OBJECTIVES AND MULTI-CRITERIA OPTIMIZATION METHODS**
Chair: Michalis Fragiadakis

18963 STOCHASTIC GRADIENT BASED MONTE CARLO SAMPLING OF PARETO OPTIMAL SOLUTIONS
Zachary Jones*, Olivier Le Maitre, Pietro Congedo*

19046 FRAMEWORK-ASSISTED IMPLEMENTATION OF AN AIRCRAFT AERO-STRUCTURAL-POWERPLANT MULTIDISCIPLINARY OPTIMIZATION PROCESS USING GEMSEO
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MS 3: **ADVANCES IN SOFT COMPUTING AND OPTIMIZATION METHODS IN ENGINEERING**
MS Organizers: Vagelis Plevris, Sadjad Gharehbaghi, Alejandro Jimenez Rios

18992 CLASSIFICATION AND COMPUTING THE DEFECTED AREA OF KNOTS IN WOODEN STRUCTURES USING IMAGE PROCESSING AND CNN
Rana Ehtisham*, Waqas Qayyum, Vagelis Plevris, Junaid Mir, Afaq Ahmad*

18889 SURROGATE MODEL BASED ON ARTIFICIAL NEURAL NETWORK FOR THE FAST PREDICTION OF HYDRODYNAMIC RESISTANCE FOR BULBOUS BOW VESSELS
Samuel Ruiz-Capel*, Aase Reyes, Dimitris Kraniotis*

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European Community on Computational Methods in Applied Sciences (ECCOMAS)

International Centre for Numerical Methods in Engineering (CIMNE)

National Technical University of Athens

Technical University of Kaiserslautern

University of Jyväskylä

European Research Community On Flow, Turbulence and Combustion (ERCOFTAC)