



9th-2023 International Conference on Control, Decision and Information Technologies

CoDiT 2023
July 03-06, 2023 - Rome, Italy



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Welcome Message

It is with great pleasure that we welcome all the participants of the 9th Conference on Control, Decision and Information Technologies (CoDIT 2023) at the University of Rome La Sapienza, Facoltà di Ingegneria Civile e Industriale, July 3-6, 2023.

CoDIT, at its 9th edition, is now an affirmed conference in the field of Control, Optimization, Decision, Computer Science and Information Technologies. From its first edition in 2013 in Tunisia, CoDIT has gained more and more international importance, reaching this year over 700 submissions, which yield to the organization of 68 Technical sessions. The Conference is enriched by 4 plenary talks from internationally recognized researchers on emerging research topics. This year the Conference features also a cultural event with the Gala Dinner held at The Botanical Garden of Rome, between Via della Lungara and Gianicolo Hill.

The conference is organized under the technical sponsorship of the IEEE Control Systems Society, the IEEE Systems, Man, and Cybernetics Society, the IEEE Robotics and Automation Society, and the International Federation of Automatic Control (IFAC) with the great support of the University of Rome “La Sapienza”.

Finally, an event of this size and importance couldn't be organized without the strong commitment of all the members of the organizing committee and support and help of a large number of volunteers. Thank you all!

On behalf of the Organizing Committee

General co-chairs



Claudia Califano

University of Rome La Sapienza
Italy



Achraf Jabeur Tilmoudi

University of Tunis
Tunisia



Enrique Herrera Viedma

University of Granada
Spain

Sponsors



*Advancing Technology
for Humanity*



**IEEE
SMC**
Systems, Man, and Cybernetics Society



INTERNATIONAL FEDERATION
OF AUTOMATIC CONTROL



SAPIENZA
UNIVERSITÀ DI ROMA



CoDIT 2023 Committees

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Achraf Jabeur Telmoudi, *Tunisia*
Enrique Herrera Viedma, *Spain*

Advisory committee co-Chairs

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Alessandro Giua, Italy	Achraf Jabeur Telmoudi, Tunisia
Nicholas Karampetakis, Greece	Enrique H. Viedma, Spain

Venue and Practical Information

CONFERENCE LOCATION

The conference will take place in **Rome**, at the Faculty of Civil and Industrial Engineering – the University of Rome “La Sapienza” at the following address:

Via Eudossiana, 18

00184 Rome

Italy

CoDIT 2023 in Rome will be held at the ancient building of the **Faculty of Engineering of the University of Rome La Sapienza**, located in **Via Eudossiana 18, Rome, Italy, in the historic center of the city**. The Faculty, which is located in the former convent of San Lorenzo in Panisperna, is situated on the Esquiline Hill directly overlooking the Colosseum and the Imperial Fora, next to the Basilica di San Pietro in Vincoli (St Peter in Chains) which is home to one of the magnificent sculptures of Michelangelo, namely the marble statue of Moses (1513-1515).



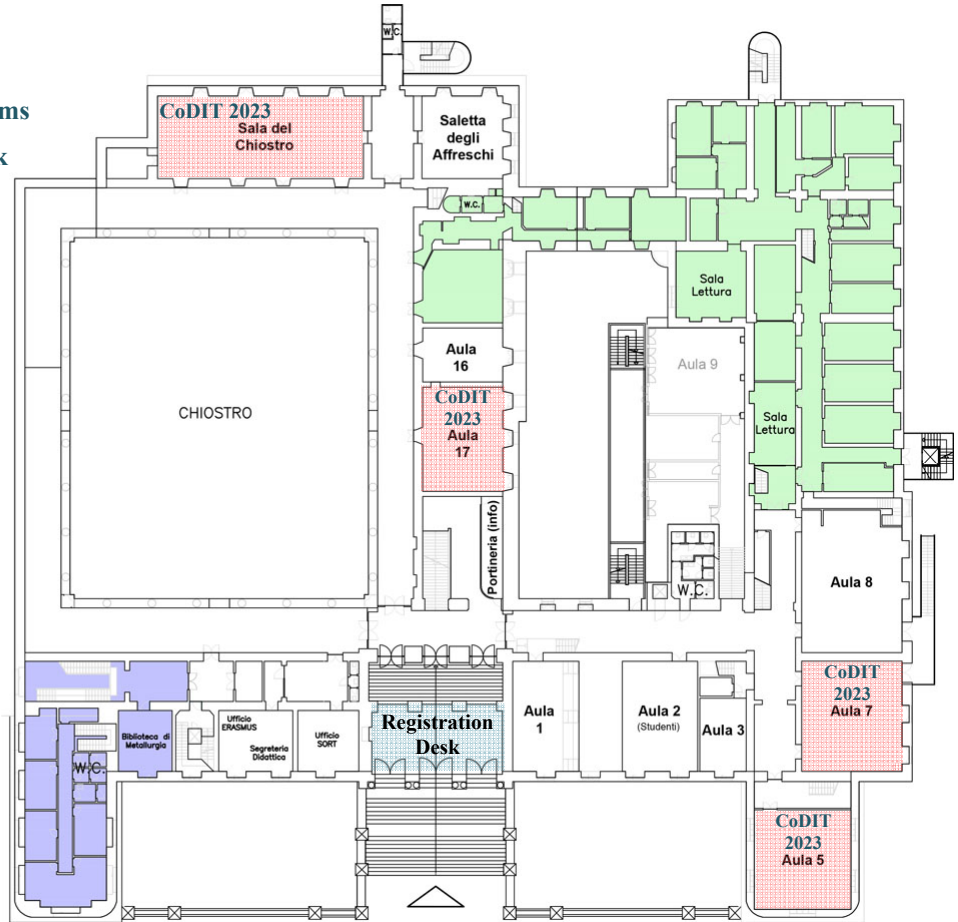
The site is less than 20 minutes walking distance from RomaTermini rail Station and a few minutes' walking distance from the metro stations of “Cavour” and “Colosseo” ([Blue line B](#)).

FACULTY MAP (CoDIT 2023 Rooms)






Piano 1

CoDIT 2023 Rooms

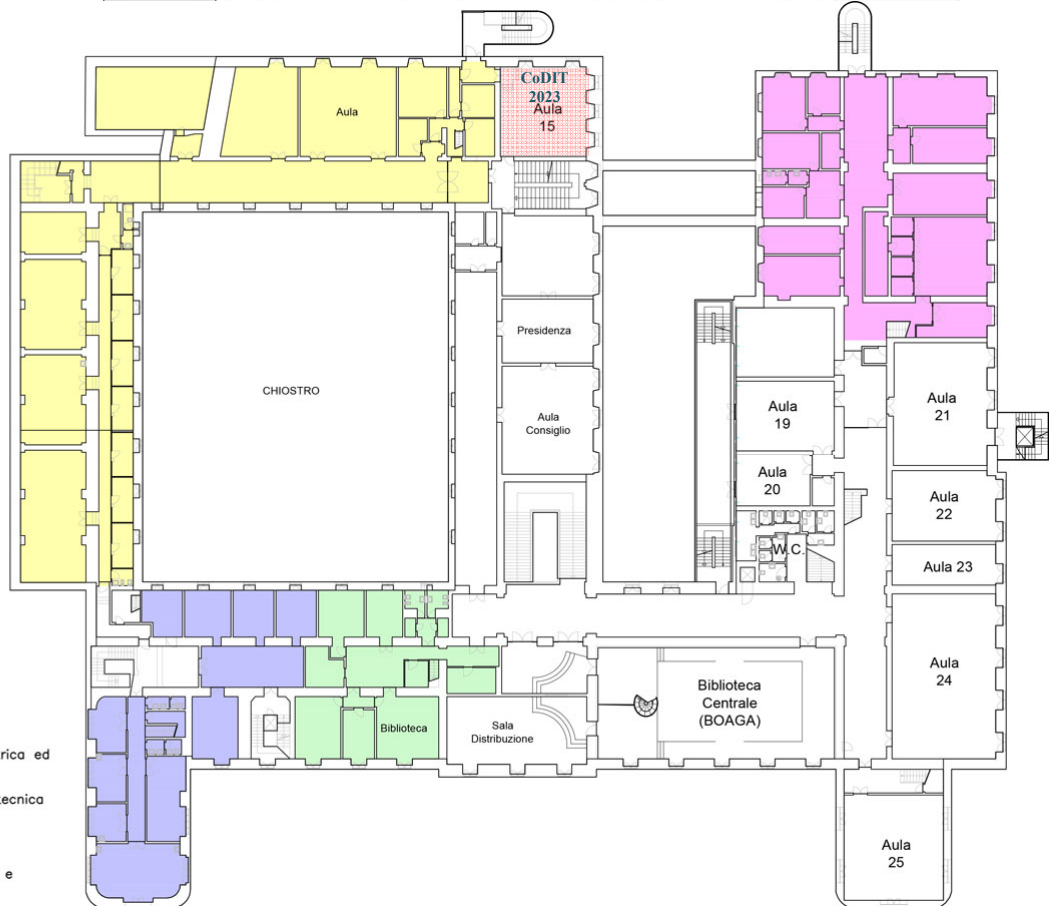
Registration Desk








LEGENDA: DIPARTIMENTI

-  Ingegneria Civile, Edile e Ambientale
-  Ingegneria Astronautica, Elettrica ed Energetica
-  Ingegneria Strutturale e Geotecnica
-  Ingegneria Meccanica e Aerospaziale
-  Ingegneria Chimica, Materiali e Ambientale

Piano 2



LEGENDA: DIPARTIMENTI

-  Ingegneria Civile, Edile e Ambientale
-  Ingegneria Astronautica, Elettrica ed Energetica
-  Ingegneria Strutturale e Geotecnica
-  Ingegneria Meccanica e Aerospaziale
-  Ingegneria Chimica, Materiali e Ambientale

GALA DINNER

The **Gala Dinner** will take place at the **Botanical Garden of Rome** and will start at 6 :30 pm. Guests are invited to get there around 6:30 pm to taste a welcome cocktail and have the chance to visit the garden with a guided tour. The Botanical Garden of Rome is one of the Museums of the Department of Environmental Biology of the Sapienza University of Rome. It covers an area of about 12 hectares in the very heart of the city.



How to reach the Botanical Garden of Rome from the Faculty of Civil and Industrial Engineering ?

The Botanical Garden of Rome is in Trastevere located in: Orto Botanico di Roma, Largo Cristina di Svezia, 23 A – 24, 00165, Rome.

To reach the Botanical Garden from San Pietro in Vincoli you can have a nice walk if you have time. The walk will last around 30-35 minutes depending on which direction you take. You can choose to walk along the Fori Imperiali, give a look to piazza Campo dei Fiori and Via Giulia. Cross the river through Ponte Sisto and walk inside Trastevere, from Piazza Trilussa to the Botanical Garden.

Otherwise you can take the bus 75 and get off in Trastevere, have a look to Piazza Santa Maria in Trastevere and get to the Botanical Garden of Rome.

The following Google Maps QR code can help you to quickly find the exact location and ways to reach the Botanical Garden of Rome from the Faculty of Civil and Industrial Engineering:



CoDIT 2023 Program

Monday - July 03, 2023						Tuesday - July 04, 2023					Wednesday - July 05, 2023				Thursday - July 06, 2023			
Registration (7:30 - 15:30)	(8:00 - 10:00) T-Sessions 1					(8:00 - 10:00) T-Sessions 5					(8:00 - 10:00) T-Sessions 9				(8:00 - 10:00) T-Sessions 14			
	VS-01	VS-02	VS-03	VS-04	VS-05	S-16	S-17	S-18	S-19	S-20	S-36	S-37	S-38	S-39	S-44	S-45	S-46	S-47
	(10:00 - 10:20) Coffee break					(10:00 - 10:20) Coffee break					(10:00 - 10:20) Coffee break				(10:00 - 10:20) Coffee break			
	(10:20- 11:20)					(10:20- 11:10)					(10:20 - 12:20) T-Sessions 10				(10:20 - 12:20) T-Sessions 15			
	Opening Ceremony & Keynote 1					Keynote 3					S-40	S-41	S-42	S-43	S-48	S-49	S-50	VS-18
	(11:20 - 13:00) T-Sessions 2					(11:10 - 12:50) T-Sessions 6					(12:20 -14:20) T-Sessions 11							
	S-01	S-02	S-03	S-04	S-05	S-21	S-22	S-23	S-24	S-25	VS-06	VS-07	VS-08	VS-09				
	(13:00 - 14:20) Lunch					(12:50 - 14:10) Lunch					(1420 -16:20) T-Sessions 12							
	(14:20- 15:10)					(14:10- 15:00)					VS-10	VS-11	VS-12	VS-13				
	Keynote 2					Keynote 4					(16:20 - 18:00) T-Sessions 13							
	(15:10 - 16:50) T- Sessions 3					(15:00 - 17:00) T-Sessions 7					VS-14	VS-15	VS-16	VS-17				
	S-06	S-07	S-08	S-09	S-10	S-26	S-27	S-28	S-29	S-30	Free time							
	(16:50- 17:10) Coffee break					(17:00 - 17:15) Coffee break												
	(17:10 - 19:10) T-Sessions 4					(17:15 - 19:15) T-Sessions 8					(18:30 - 22:00) Gala dinner							
	S-11	S-12	S-13	S-14	S-15	S-31	S-32	S-33	S-34	S-35								

IMPORTANT

PRESENTATIONS - DURATION

- **Keynote:** The duration of each presentation is of 40 minutes plus 10 minutes for questions.
- **Oral presentation (Regular):** The max duration of each presentation is of 13 minutes plus 5 minutes for questions.

Accepted file formats for all presentations are PDF and PPT.

Sessions Titles - Papers ID/Session & Rooms

Day, Time, TS			Code	Title	Papers ID	Rooms
Monday - July 03, 2023	8:00 - 10:00	T-Sessions 1 (Virtual)	VS-01	Fault Detection and Diagnosis	151, 402, 558, 248, 270, 211, 593	Sala del Chiostro
			VS-02	Energy Control with Applications	103, 573, 519, 1, 498, 533, 639	Aula 5
			VS-03	Robotics	275, 481, 266, 603, 367, 644, 78	Aula 7
			VS-04	Operational Research and Scheduling	625, 616, 175, 202, 170, 507, 431	Aula 17
			VS-05	Hybrid and Discrete Event Systems	324, 84, 353, 181, 178, 261, 246	Aula 15
	11:20 - 13:00	T-Sessions 2	S-01	Sensors, Mobile and Wireless Communications	642, 242, 146, 64, 199, 408	Sala del Chiostro
			S-02	Optimization with Control Applications	469, 403, 505, 539, 321, 658	Aula 5
			S-03	Control Design Methods (Part 1)	420, 126, 200, 100, 118, 274	Aula 7
			S-04	Predictive Control	86, 154, 508, 356, 105, 461	Aula 17
			S-05	Neural Networks in Control	560, 604, 238, 235, 633, 364	Aula 15
	15:10 - 16:50	T-Sessions 3	S-06	Special Session - Optimization problems related to telecommunication network	137, 629, 135, 185, 115, 250	Sala del Chiostro
			S-07	Intelligent Control	612, 440, 436, 522, 152, 445	Aula 5
			S-08	Control Applications (Part 1)	196, 65, 595, 584, 569, 265	Aula 7
			S-09	Modeling and Simulation	447, 362, 340, 124, 407, 559	Aula 17
			S-10	Image Processing and applications	393, 396, 370, 608, 493, 464	Aula 15
	17:10 - 19:10	T-Sessions 4	S-11	Learning Systems	647, 348, 132, 450, 415, 369, 213	Sala del Chiostro
			S-12	Software Engineering	215, 610, 617, 276, 162, 388, 562	Aula 5
			S-13	Diagnosis and Fault Detection	479, 214, 21, 229, 82, 424, 204	Aula 7
			S-14	Combinatorial Optimization	292, 575, 429, 256, 381, 478, 413	Aula 17
			S-15	Control Design Methods (Part 2)	251, 328, 392, 484, 594, 326, 307	Aula 15

Day, Time, TS			Code	Title	Papers ID	Rooms
Tuesday - July 04, 20230	8:00 - 10:00	T-Sessions 5	S-16	Energy Control	280, 525, 93, 384, 83, 515	Aula 5
			S-17	Optimal Control (Part 1)	273, 365, 463, 46, 483, 325, 306	Sala del Chiostro
			S-18	Linear Systems	322, 489, 581, 510, 164, 203, 89	Aula 7
			S-19	Predictive Control with Applications	506, 281, 79, 35, 77, 550, 69	Aula 17
			S-20	Transport Optimization	156, 269, 117, 116, 309, 136, 283	Aula 15
	11:10 - 12:50	T- Sessions 6	S-21	Energy Control and Power Systems	163, 571, 263, 389, 139, 437	Aula 5
			S-22	Special Session - Optimization of Healthcare Management Systems	36, 335, 626, 543, 45, 390, 311	Sala del Chiostro
			S-23	Special Session - Advanced ICT, optimization and control for Industry 4.0	561, 526, 549, 397, 587, 504, 372	Aula 7
			S-24	Special Session - Robotics for logistics and transportation systems	518, 443, 94, 503, 17, 374	Aula 17
			S-25	Control of Nonlinear Systems	434, 232, 225, 566, 51, 161, 308	Aula 15
	15:00 - 17:00	T-Sessions 7	S-26	Special Session - Models and decision support methods for logistics, transportation, and manufacturing systems	44, 318, 320, 52, 337, 80, 554	Sala del Chiostro
			S-27	Monitoring and Supervision	29, 494, 189, 417, 157, 385, 536	Aula 5
			S-28	Multi-Objective Optimization	125, 145, 661, 92, 601, 580, 72	Aula 7
			S-29	Artificial Intelligence with Applications	511, 131, 172, 41, 297, 314, 282	Aula 17
			S-30	Robotics (Part 1)	467, 532, 624, 339, 357, 296	Aula 15
	17:15 - 19:15	T-Sessions 8	S-31	Graphs and Networks	485, 216, 197, 313, 572, 247, 201	Sala del Chiostro
			S-32	Scheduling Problems	206, 56, 432, 342, 514, 42, 236	Aula 5
			S-33	Prediction and Supervision in Control and Engineering	502, 497, 97, 8, 333, 409, 153	Aula 7
			S-34	Discrete Event Systems	271, 277, 191, 500, 547, 655, 50	Aula 17
			S-35	Applied Control Design Methods	327, 476, 165, 541, 234, 133, 418	Aula 15

Day, Time, TS			Code	Title	Papers ID	Rooms
Wednesday - July 05, 2023	8:00 - 10:00	T-Sessions 9	S-36	Special Session - Learning methods in modeling and control of robotic systems	244, 386, 465, 304, 209, 141, 704	Aula 5
			S-37	Optimal Control (Part 2)	198, 74, 143, 531, 425, 363, 657	Aula 7
			S-38	Process Control	310, 567, 378, 379, 179, 520, 144	Aula 17
			S-39	Artificial Intelligence	4, 102, 470, 106, 345, 501, 419	Aula 15
	10:20 - 12:20	T-Sessions 10	S-40	Robotics (Part 2)	557, 373, 456, 349, 430, 540, 427	Aula 5
			S-41	Artificial Intelligence Approaches	428, 521, 113, 556, 32, 545, 530	Aula 7
			S-42	Sensors and Instrumentation	350, 492, 195, 287, 138, 147, 177	Aula 17
			S-43	Signal Processing	278, 49, 535, 405, 551, 442, 448	Aula 15
	12:20 -14:20	T-Sessions 11	VS-06	Forecasting in Control and Engineering	512, 268, 260, 623, 55, 98, 319	Virtual
			VS-07	Intelligent Systems	290, 474, 28, 338, 34, 54, 341	Virtual
			VS-08	Artificial Intelligence	60, 148, 224, 237, 291, 377, 605	Virtual
			VS-09	Control Applications	134, 471, 279, 529, 259, 628, 597	Virtual
	14:20 -16:20	T-Sessions 12	VS-10	Control Design Methods	262, 509, 75, 68, 449, 598, 112	Virtual
			VS-11	Control Theory	660, 398, 513, 568, 110, 451, 570	Virtual
			VS-12	Software Engineering	564, 169, 194, 239, 317, 218, 352	Virtual
			VS-13	Image Processing	355, 233, 70, 404, 517, 395, 231	Virtual
	16:20 - 18:00	VT-Sessions 13	VS-14	Nonlinear Systems	39, 81, 387, 323, 588, 95, 99	Virtual
			VS-15	Optimal Control	619, 184, 73, 635, 108, 634, 73	Virtual
			VS-16	Energy Control and Power Systems	592, 590, 190, 632, 637, 600	Virtual
			VS-17	System Identification	636, 524, 462, 228, 414, 659, 516	Virtual
Thursday - July 06, 2023	8:00 - 10:00	T-Sessions 14	S-44	Modeling and Simulation with Applications	122, 53, 609, 128, 222, 85, 361	Aula 5
			S-45	Applied Intelligent Approaches	129, 548, 410, 286, 219, 58, 426	Aula 7
			S-46	Nonlinear Systems	366, 299, 66, 435, 534, 295, 646	Aula 17
			S-47	Supply Chain Management	527, 59, 455, 284,123, 358, 645	Aula 15
	10:15 - 12:15	T-Sessions 15 (Hybrid)	S-48	System Identification	460, 618, 359, 305, 468, 611, 654	Aula 5
			S-49	Control Applications (Part 2)	343, 496, 486, 577, 376, 371	Aula 7
			S-50	Computer Science with applications	347, 621, 329, 114, 394, 360, 599, 585	Aula 17
			VS-18	Transport Optimization	615, 400, 88, 354, 150, 312, 90	Aula 15

Keynotes

KEYNOTE 1

(July 03, 2023 / 10:30-11:20)

“Recent trends in opinion dynamics modeling”

Prof. Maria Elena Valcher

University of Padova, Italy

Chair: Prof. Bahram Shafai, Northeastern University, USA

Room : Sala del Chiostro

Abstract

Over the last few decades, the study and analysis of sociological phenomena have attracted the interests of researchers from various fields, such as sociology, economics, and mathematics.

Opinion dynamics models aim at describing and predicting the evolution of the opinions of a group of individuals as a result of their mutual influence/appraisal.

Some of the most celebrated models to describe how opinions of a group of mutually interacting individuals evolve are the Hegselmann-Krause (or Bounded-Confidence) model and the Friedkin-Johnsen (FJ) model. The former captures the natural attitude of individuals to be influenced only by the individuals whose opinions are reasonably close to their own. The latter, instead, models the attitude of individuals to form their opinions by balancing exogenous and endogenous influences, namely to find a compromise between the opinions of the other individuals and their a priori beliefs.

In this talk we will present recent results about extended versions of these two models, and present some future directions and challenges related to opinion dynamics models.

Biography of Prof. Maria Elena Valcher



Maria Elena Valcher received the Master's degree in electrical engineering and the Ph.D. degree in system engineering from the University of Padova, Padova, Italy, in 1991 and 1995, respectively.

Since January 2005, she has been a full Professor with the University of Padova. She has authored or co-authored 80 papers, which appeared in international journals, 95 conference papers, 2 text-books, and several book chapters. Her research interests include multidimensional systems theory, polynomial matrix theory, behavior theory, cooperative control and consensus, positive switched systems, and Boolean control networks.

Dr. Valcher was in the Editorial Board of the IEEE Transactions on Automatic Control from 1999 to 2002 and Systems and Control Letters from 2004 to 2010.

She has been on the Editorial Boards of Automatica since 2006, Multidimensional Systems and Signal Processing since 2004, SIAM Journal on Control and Optimization since 2012, European Journal of Control since 2003, and IEEE Access since 2014. She was Vice President Member Activities of the CSS from 2006 to 2007, Vice President Conference Activities of the CSS from 2008 to 2010, and CSS President in 2015. She was a recipient of the 2011 IEEE CSS Distinguished Member Award. Since January 2017, she has been the Editor-in-Chief for the IEEE Control Systems Letters.

KEYNOTE 2

(July 03, 2023 / 14:20-15:10)

“State estimation and event inference in discrete event systems”

Prof. Carla Seatzu

University of Cagliari, Italy

Chair: Prof. Maria Pia Fanti, Polytechnic University of Bari, Italy

Room : Sala del Chiostro

Abstract

Partially observed discrete event systems are a general formalism dating back to the definition of nondeterministic finite state automata. The assumption is that the sequence of events generated by a system is observed through a mask, so that an observer may have incomplete information concerning the system's evolution and, correspondingly, the past and current state. This framework has been used to formalize and solve several problems. The most basic problem is that of state estimation, which in the automatic control literature is usually solved by building an observer. A related problem is that of fault diagnosis which consists in establishing if a system is affected by a malfunctioning and identifying its nature. An additional interesting problem in the context of fault diagnosis is diagnosability analysis, which aims to determine if a system is diagnosable, i.e., if the occurrence of a fault can be identified in a finite number of steps. More recent problems in the area of cyber-security, are opacity, a privacy issue of great importance to ensure data secrecy, and the dual notion of intrusion detection, i.e., understanding if a system's evolution has been affected by the action of some external agent. In the case of cyber-physical systems, all the above problems become more challenging because the estimation may be subject to malicious cyber attacks, thus ad hoc approaches need to be formulated.

The objective of this talk is that of describing the general setting of partially observable discrete event systems showing, by means of examples, how some of the above-mentioned problems can be addressed. A 13aifeng13he on the most relevant open issues in this area is finally presented.

Biography of Prof. Carla Seatzu



Carla Seatzu is Full Professor of Automatic Control at the Department of Electrical and Electronic Engineering of the University of Cagliari where in 2018-2022 she was Coordinator of the B.Sc. Degree in Electrical, Electronic and Computer Engineering; in 2015-2018 she was Vice-President of the Faculty Committee of Engineering and Architecture; in 2014-2019 she was Vice-Coordinator of the Ph.D. Program in Electronic and Computer Engineering. Her research interests include discrete-event systems, Petri nets, hybrid systems, networked control systems, manufacturing and transportation systems. She is author of over 270 publications, including over 80 papers in international journals and 1 textbook. Her h-index in Scopus is equal to 38.

She is editor of 2 international books and the proceedings of 2 international conferences. Currently she is Senior Editor of the IEEE Control Systems Letters and the IEEE Trans. On Automation Science and Engineering. She is Department Editor of Discrete event dynamic systems. She actively collaborated to the organization of several international events: she was Program Chair of the 23rd IEEE Int. Conf. on Emerging Technologies and Factory Automation (2018), Workshop Chair of the 55th IEEE Conf. on Decision and Control (2016) and General Co-chair of the 18th IEEE Int. Conf. on Emerging Technologies and Factory Automation (2013). She is Chair of the IFAC Technical Committee on Discrete Event and Hybrid Systems and has been Co-Chair of the IEEE Industrial Electronic Society – Technical Subcommittee on Industrial Automated Systems and Control. She has been visiting professor in several foreign universities in Spain (Zaragoza), USA (Atlanta), Mexico (Guadalajara), and China (Xi'an, Hangzhou).

KEYNOTE 3

(July 04, 2023 / 10:20-11:10)

“Modeling, Analysis, and Design of Influence in Multi-Agent Systems”

Prof. Bruno Sinopoli

Washington University, USA

Chair: Prof. James H. Lambert, University of Virginia, USA

Room : Sala del Chiostro

Abstract

Systems of intelligent agents interacting according to their own policies may yield behavior that is contrary to the social good of the community. To achieve regulatory control objectives that change the group's equilibrium behavior, an intelligent central planner (CP) must understand the learning mechanisms at the individual level, characterize how global intervention disrupts these learned action processes, and choose control policies that induce the desired change. This framework describes phenomena such as social media, financial networks, and cyber-physical systems like power grids. In this talk I model this influence structure as a Markov decision process (MDP) with the CP as the controller. I characterize the CP's capabilities for a given scenario by analyzing the reachability of control objectives and finding policies that attain reachable objectives. I discuss how to implement cluster-based control policies, from how to efficiently compute near-optimal clustered policies to using properties of submodular optimization to assign agents to clusters. Next, I consider the problem of model-free policy design that is robust to agent dropout. First, game theoretic techniques measure the potential impact of each agent on the CP's value function, and the desired robustness criterion is embedded into the MDP. The post-dropout MDP can be evaluated with high probability via policy importance sampling, and safe policy search routines find desirable robust policies while maintaining a baseline value. Future work is motivated that would enable more sophisticated control techniques to handle systems at scale and with greater complexity.

Biography of Prof. Bruno Sinopoli



Bruno Sinopoli is the Das Family Distinguished Professor at Washington University in St. Louis, where he is also the founding director of the center for Trustworthy AI in Cyber-Physical Systems and chair of the Electrical and Systems Engineering Department. He received the Dr. Eng. Degree from the University of Padova in 1998 and his M.S. and Ph.D. in Electrical Engineering from the University of California at Berkeley, in 2003 and 2005 respectively. After a postdoctoral position at Stanford University, Dr. Sinopoli was member of the faculty at Carnegie Mellon University from 2007 to 2019, where he was a professor in the Department of Electrical and Computer Engineering with courtesy appointments in Mechanical Engineering and in the Robotics Institute and co-director of the Smart Infrastructure Institute. His research interests include modeling, analysis and design of Resilient Cyber-Physical Systems with applications to Smart Interdependent Infrastructures Systems, such as Energy and Transportation, Internet of Things and control of computing systems. More recently, he has been working on understanding connections between Machine and human learning and influence mechanisms in multi agent systems.

KEYNOTE 4

(July 04, 2023 / 14:10-15:00)

“Optimization of Multi-Robot Systems”

Prof. Dimitri Lefebvre

Université Le Havre Normandie, France

Chair: Prof. Dimos Dimarogonas, KTH Royal Institute of Technology, Sweden

Room : Sala del Chiostro

Abstract

In the last years, Multi-Robot Systems (MRS) have experienced considerable recognition due to various real-world applications. Multi-Robot Task Allocation (MRTA) is among the most interesting MRS problems. This problem concerns the situation when a set of given tasks must be performed by a team of mobile robots that collaborate with the intention of optimizing an objective function. The first objective of this talk is to present the MRTA challenges and applications, and to give a summary of the different optimization techniques proposed recently by researchers to solve MRTA problems.

The second objective is to provide an operational and methodological response for the monitoring of industrial areas in the perspective of MRTA. The aim is to optimize monitoring patrols of mobile agents that are responsible for the surveillance of such areas. Such agents are mostly formed by automated guided vehicles or unmanned aerial vehicles that carry various sensors. Apart from the specificities of each class of agents, the proposed approach is motivated by the need to inspect sites that may be dangerous or difficult to access, in particular after an event or a disaster.

The optimization of the missions is carried out in compliance with functional and operational constraints in the triple perspective of tasks allocation, patrol planning and trajectories routing as far as these aspects are strongly correlated. The questions that will be discussed are as follows. How to define the patrol and trajectory of each robot? How many agents are required to perform a given set of tasks? How many sensors and what types of sensors must each of these agents equip? Such questions are studied in an MRTA setting, and an approach based on an informed search method is proposed for that purpose.

The longer-term challenge that is initiated here is to manage the resources for monitoring and intervention in high risk areas in an automated way by combining predictive and decision-making methods, and using model-based approaches as well as database-based approaches. Future challenges will be presented in the last part of the presentation including tasks updating, reliability aspects, optimization in distributed settings, infrastructure changes, maps recovery, security and communication issues and many others.

Biography of Prof. Dimitri Lefebvre



Dimitri Lefebvre (Senior Member, IEEE) received the S.B. in Science and Engineering in 1990, the M.Eng. degree in Automatic Control and Computer Science in 1992, and the Ph.D. degree Automatic Control and Computer Science in 1994, all from University of Sciences and Technologies and Ecole Centrale in Lille, France. In 1995, he joined the University of Franche Comté, Belfort, France, where he served as Associate Professor with the Department of Electrical Engineering and the Research Group about Systems and Transportations. Since 2001, he has been with University Le Havre Normandie, France as Full Professor. He is currently with the Research Group on Electrical Engineering and Automatic Control (GREAH) in Le Havre and was from 2007 to 2012 the head of the group. His current research interests include discrete event systems and stochastic systems with applications to

security and safety in the domains of electrical engineering, robotics, transportations and logistics. He is the authors of more than 100 articles published in indexed journals and more than 200 communications in international conferences.

Papers / Session & Sessions chairs

Session VS-01: Fault Detection and Diagnosis

Session chair(s): Samah Kahouadji & Mohamed Ghazel

Paper ID	Title	Authors
151	Fault Tolerant Control of HVAC System Based on Reinforcement Learning Approach	Yanis Masdoua*, Moussa Boukhniher, Kondo Hloindo Adjallah (France)
402	Multi-Sensors Fault Tolerant Detection and Isolation for Cooperative Control in Highway Merging	Samah KAHOUADJI*, Chouki Sentouh, Cindy Cappelle, Jean-Christophe POPIEUL, Maan EL BADAQOUI EL NAJJAR (France)
558	Deep Generative Model with Isolation Forest (DGM-IF) for Unsupervised Anomaly Detection in Wireless Sensor Network and Internet of Things	Miloud Mihoubi*, Meriem Zerkouk, Belkacem Chikhaoui (Canada)
248	Detection of Event-Based Covert Attacks in Cyber-Physical Systems	Ali Eslami*, Khashayar Khorasani (Canada)
270	Detection of Inter Turn Short Circuit Fault on Stator of Doubly Fed Induction Machine by Perimeter Analysis	Habachi BILAL, Svetlana DYAGILEVA, Nicolas HERAUD*, Eric Jean Roy SAMBATRA (France)
211	Speed Estimation of Induction Motor using Gaussian Process Regression	Chinmayi Wagh*, SHIVAM CHAURASIA, Revati gunjal (India)
593	State Estimation and Fault Reconstruction for a Class of Linear Uncertain Time-Delay Systems	Iskander Boulaabi*, Amal NASRI, Anis SELLAMI, Fayçal BEN HMIDA (Tunisia)

Session VS-02: Energy Control with Applications

Session chair(s): Diego Greff

Paper ID	Title	Authors
103	Electrical Power Optimization in an LED Lighting System Using Artificial Deep Neural Network	Mohammed Amine JOUAHRI*, Zakaria BOULGHASOUL, abdelouahed tajer (Morocco)
573	Non-Invasive Fault Detection through External Magnetic Field Aided by Sigma-Delta Microcontroller	Vilson Garcia, Alberto Maciel de Oliveira Teles Filho, Diego Santos Greff* (Brazil)
519	Analysis, Modelling and Cancellation of Acoustic Disturbances in DC Motors	Mirza Cizmic*, Fabian Bayer, Abid Ali (Germany)
1	Intelligent Internal Climate Control System for Agricultural Greenhouses Based on IoT Technology	Asma Tanazefti, AMIRA HADDOUK*, Hfaiedh Mechergui (Tunisia)
498	A Multilevel Optimization Model for a Distribution Power Grid with the Active Participation of Electric Vehicles Via Aggregators	Daniel Fernández Valderrama*, Giulio Ferro, Luca Parodi, Michela Robba (Italy)
533	Single Phase Shift Control Strategy of Isolated Single Phase Dual Active Bridge DC/DC Converter	Faouzi Tlili*, Faouzi Bacha (Tunisia)
639	Study and Analysis of the Indirect Matrix Converter for Wind Energy System Based on FOC-SVM and MPC Control Techniques	Abdessami Soyed*, Abdelkarim Aouiti, Faouzi Bacha (Tunisia)

Session VS-03: Robotics

Session chair(s): Ngoc Thinh Nguyen & Valeri Kroumov

Paper ID	Title	Authors
275	Pre-Cooling of Milk in Robotic Milking	Dimitar Karastoyanov*, Elena Blagoeva, Kancho Peychev (Bulgaria)
481	Gripper Design Optimization for Effective Grasping of Diverse Object Geometries	Marco Todescato*, Andrea Giusti, Dominik Matt (Italy)
266	Adaptive High Order Sliding Mode Control of a Robotic Arm: Experimental Application	Fatma Abdelhedi* (Saudi Arabia)
603	Effect of Magnetic Moments towards Swimming Behavior and Performance of the Soft Milli-Robots	Xiuzhen Tang, Laliphat Manamanchaiyaporn* (Thailand)

367	Autonomous PSO-DVSF ² in the Control of Real Mobile Robots in Unknown Environments	Safa ZIADI*, Abderraouf BENALI, Njah Mohamed (Tunisia)
644	B-spline-To-Bézier Conversion and Applications on Path Planning	Ngoc Thinh Nguyen*, Pranav Tej Gangavarapu, Floris Ernst (Germany)
78	Neural Network Control of a SOTM Antenna	Oğuz Kaan Hancioğlu*, Mehmet Önder Efe (Turkey)

Session VS-04: Operational Research and Scheduling

Session chair(s): Ivan Samylovskiy & Gabor Kiss

Paper ID	Title	Authors
625	Energy Efficient Operational Scheduling Framework for Electric Vehicle Battery Swapping Station	Dhyaan S Nayak, Shamik Misra* (India)
616	Hybrid Algorithm for Multiprocessor Scheduling with Makespan Minimization and Constraint on Interprocessor Data Exchange	Vasily Balashov*, Valery Kostenko (Russia)
175	Discrete Invasive Weed Optimization and Greedy Hybridization Algorithm for Home Care Multi-Days Assignment Scheduling and Routing Problems	Mira BOU SALEH*, Olivier Grunder, Amir HAJJAM EL HASSANI (France)
202	A Linear Algorithm for the Eternal Feedback Vertex Set on Interval Graphs	Nour DYAB, Mohammed LALOU*, Hamamache KHEDDOUCI (France)
170	No-Wait Two-Machine Permutation Flow Shop Scheduling Problem with a Single Server and Separable Setup Times to Minimize Total Tardiness	Fouad MEDOUAR*, Abdelhak ELIDRISSI, Rachid Benmansour, Jatinder Gupta (Morocco)
507	Distributed Load Balancing Based on Modified Local Voting Protocol	Elena Borisoglebskaia*, Victoria Erofeeva, Oleg Granichin, Yury Ivanskiy (Russia)
431	Heat Transfer Performance of a Heat Sink Using Triply Periodic Minimal Surfaces (TPMS) Structures	Issam EL KHADIRI*, Mohamed Abouelmajd, Maria Zemzami, Nabil Hmina, Manuel Lagache, Bandar AlMangour, Ahmed Bahlaoui, Ismail Arroub, Soufiane Belhouideg (Morocco)

Session VS-05: Hybrid and Discrete Event Systems

Session chair(s): Giuseppe Franze & Sébastien Lahaye

Paper ID	Title	Authors
324	Transfer Function Modeling Approach for Inverter-Dominated Grid	Devangee Bhurawalla*, Chinmayi Wagh (India)
84	Verification of Detectability for Unambiguous Weighted Automata Using Self-Composition	Shaowen Miao, Aiwen LAI*, Sébastien Lahaye, Jan Komenda (China)
353	Fractal Programming Elastic Networks	Alexander Semenov* (Russia)
181	A Hybrid Trust Update Solution for Dynamic Social IoT Trust Management Model	Rim Magdich*, Hanen Jemal, Mounir Ben Ayed (Tunisia)
178	Large Language Models and Adversarial Reinforcement Learning to Automate PLCs Programming: A Preliminary Investigation	Abderrahmane Boudribila*, Mohamed-Amine Chadi, Abdelouahed Tajer, Zakaria Boulghasoul (Morocco)
261	The Multiple Pairs Shortest Path Problem for Sparse Graphs: Exact Algorithms	Roland Grappe, Mathieu Lacroix*, Sébastien Martin (France)
246	Multiple-Input Reset-And-Hold Control of Systems with Delay	Jose F. Saez*, ALFONSO BAÑOS, Aurelio Arenas (Spain)

Session S-01: Sensors, Mobile and Wireless Communications

Session chair(s): Owen Casha & Imene Jegham

Paper ID	Title	Authors
642	Federated Learning Architecture to Integrate AI Models from Different Internet Service Providers: Using Bandwidth Slicing Resource Management As Case Study	Yen-Hung Chen* (Taiwan, R.O.C)
242	Communication Efficient Cooperative Visual-Range-Inertial Localization	Chunyu Li, Jianan Wang*, Junhui Liu, Jiayuan Shan (China)

146	A Defense Strategy for Securing Wireless Sensor Networks	Djamel MANSOURI*, Malika IOUALALEN (Algeria)
64	A Greedy Method for Coverage Path Planning of Autonomous Heterogeneous UAVs	Francesco Buccafurri*, Francesca Scoleri (Italy)
199	Speech Command Recognition Systems Based on Two Different Artificial Intelligence Approaches	Faycal Nait Irahah*, Chaimaa Lebdaoui, Dagmar Meyer (Germany)
408	ID-Based Routing: A Grid Topology Protocol	Anas Alroubaiey*, Mojeeb Alkhiaty (Saudi Arabia)

Session S-02: Optimization with Control Applications

Session chair(s): Daniela Iacoviello & Branimir Mrak

Paper ID	Title	Authors
469	An Automatic Algorithm in the AAA Framework for Fitting Noisy Frequency Responses	Rastko Zivanovic* (Austria)
403	Output Feedback Design for a Class of Nonlinear Sampled-Data Systems Based on a Hybrid Observer	Fatima Bassot*, Tarek AHMED-ALI, salim ziani, Homere Nkwawo (Algeria)
505	Optimal and Charge-Sustainable Energy Management Systems for Industrial DC Grids	Taranjitsingh Singh*, Jeroen Willems, Bruno Depraetere, Glenn Emmers, Thomas Vandenhove, Jeroen Stuyts (Belgium)
539	Finite-Time Feedback Stabilization of Linear Descriptor Systems	Dmitry Konovalov, Konstantin Zimenko, Artem Kremlev, Dmitrii Dobriborsci*, Alexey Margun (Germany)
321	Optimal Cooperative Circumnavigation Control of Multiple Robots: A Mean Field Method	Yangguang Yu, Xiangke Wang*, Lincheng Shen (China)
658	Comparative study of different types of PV plant grounding on the Potential Induced Degradation.	Khammassi Zied*, Jawher chroua, Abderrahmen ZAAFOURI (Tunisia)

Session S-03: Control Design Methods (Part 1)

Session chair(s): James Pickering & Raziye Tekin

Paper ID	Title	Authors
420	Experimental Study on Output Robust Control of a Surface Vessel with Uncertainties and Exogenous Disturbances	Andrei Zhivitskii*, Zakharov Dmitrii, Oleg Borisov (Russia)
126	Evaluating the Performance of the Well-Known Controller Tuning Methods for the Flow Control Using the Process Model	Nur Assani*, Petar Matić, Danko Kezić (Croatia)
200	Analytical Safety Bounds for Trajectory Following Controllers in Autonomous Vehicles	Robert Jacumet*, Christian Rathgeber, Vladislav Nenchev (Germany)
100	An Improved Stability Analysis for the L1 Adaptive Augmentation of a Baseline Controller	Andrea Dan Ryals*, Giulia Bertolani, Lorenzo Pollini, fabrizio giulietti (Italy)
118	Research on Fractional-Order Controllers for Liquid Level Control of Nonlinear System Using Optimization Technique	Jayaram Sabavath, Nithya Venkatesan* (India)
274	Output Stabilization of Lure-Type MIMO Nonlinear Control Systems in Given Set	Ba Huy Nguyen*, Igor Furtat (Russia)

Session S-04: Predictive Control

Session chair(s): Marco Frego & Luis Recalde

Paper ID	Title	Authors
86	Model Predictive Control of Industrial Trucks with AI-Based Plant Model Selection	Timm Sauer*, Luca Spielmann, Manuel Gorks, Klaus Zindler, Ulrich Jumar (Germany)
154	Model Predictive Control for UAV Geofencing	Luca Cavanini, Francesco Ferracuti*, Gianluca Ippoliti, Giuseppe Orlando (Italy)
508	A Stochastic Model Predictive Control Approach to Deal with Cancerous Tumor Growth	Andrés Hernández-Rivera*, Pablo Velarde, Ascension Zafra Cabeza, J. M. Maestre (Spain)
356	Path Tracking for Wheeled Mobile Robot Using Non Linear Model Predictive Control in Indoor Environment	Alessandro Bozzi, Simone Graffione*, Michiel Maria Wilhelmus Kockelkoren, Roberto Sacile, Enrico Zero (Italy)

105	Data-Driven Model Predictive Control Using Deep Double Expected Sarsa	MoradiMaryamnegari Hoomaan*, Marco Frego, Angelika Peer (Italy)
461	Influence of Controller on Cable Driven Lower Limb Rehabilitation Exoskeleton (C-LREX): PD vs MPC	Rajan Prasad, Kinda Khalaf, Mohammad I. Awad, Marwan El-Rich* (United Arab Emirates)

Session S-05: Neural Networks in Control

Session chair(s): Ahdrian Camilo Gernale & Chaoyi Dong

Paper ID	Title	Authors
560	A CNN and GRU based composite classification method for motor imagery EEG signals	huanzi Liu, Chao-Yi Dong*, Pengfei Ma, Ruijing Ruijing Lin, Dongyang Lei, 晓艳 陈 (China)
604	Adaptive NMPC-RBF with Application to Manipulator Robots	Luis F Recalde* (Ecuador)
238	A Neural Network and Model Predictive Control Based Resilient Architecture for Constrained Cyber-Physical Systems	Luigi D'Alfonso, Giuseppe Franze', Francesco Giannini*, Francesco Tedesco (Italy)
235	Model Predictive Control of Fuel Cells Using a Neural Network Based Inverted Model	Jean-Yves Dieulot* (France)
633	Maximizing CNN Accuracy: A Bayesian Optimization Approach with Gaussian Processes	Abed AlRaoof BSOUL* (Jordan)
364	Hypercomplex Multilayer Perceptron for Planetary Orbits Prediction	Arturo Buscarino, Carlo Famoso*, Luigi Fortuna, Gabriele Puglisi (Italy)

Session S-06: Special Session – Optimization problems related to telecommunication network

Session chair(s): Amal Benhamiche & Sébastien Martin

Paper ID	Title	Authors
137	Optimal Admission Control in Damper-Based Networks: Branch-And-Price Algorithm	M. Yassine Naghmouchi, Shoushou Ren, Paolo Medagliani, Sébastien Martin*, Jérémie Leguay (France)
629	A GOA-Optimized Visible Light Communication System For Indoor High-Precision 3-D Positioning Service	Ahmad Tavana, Ziamanesh Sam, Hadi S. Salimi*, Amir Aminzadeh Ghavifekr, Paolo Visconti (Iran)
135	The Multi-Commodity Flow Problem with Disjoint Signaling Paths: A Branch-And-Benders-Cut Algorithm	Jiachen Zhang, Youcef Magnouche, Sébastien Martin*, Antoine Fressancourt, Chris Beck (France)
185	A Branch-And-Benders-Cut Approach to Solve the Maximum Flow Blocker Problem	Isma Bentoumi*, Sébastien Martin, A. Ridha Mahjoub, Furini Fabio (France)
115	Unsplittable Multi-Commodity Flow Problem Via Quantum Computing	Miguel Pineda Martín, Sébastien Martin* (France)
250	Unsplittable Shortest Path Routing: Extended Model and Matheuristic	Amal Benhamiche*, Morgan Chopin, Sébastien Martin (France)

Session S-07: Intelligent Control

Session chair(s): Alexandra-Iulia Szedlak-Stinean

Paper ID	Title	Authors
612	Multi-Agent Reinforcement Learning with Epistemic Priors	Thayne Walker*, Jaime, S. Ide, Kevin Alcedo, Minkyu Choi, Michael Guarino (USA)
440	SMA-Based Tuning of PI Controller Using Takagi-Sugeno Fuzzy Observers for an Electromechanical System with Variable Parameters	Alexandra-Iulia Szedlak-Stinean*, Radu-Emil Precup, Raul-Cristian Roman, Emil Petriu (Romania)
436	Opinion Dynamics Optimization through Noncooperative Differential Games	Hossein Barghi Jond* (Czech Republic)
522	Modelling and Simulation of a Mamdani Fuzzy PID Controller Using Non-Uniformly Distributed Fuzzy Sets	Khushboo Kumari*, Murali Mohan (India)

152	Data-Driven Adaptive Torque Allocation for Electric Vehicles	Luca Cavanini, Francesco Ferracuti*, Sauro Longhi, Andrea Moneriù (Italy)
445	Optimisation of a Renewable Energy System by PSO Algorithms	Abdelhak Ghalem*, Abdellatif NACERI, Y.DJERIRI DJERIRI Youcef (Algeria)

Session S-08: Control Applications (Part 1)

Session chair(s): **Ciro Natale & Ruben Garrido**

Paper ID	Title	Authors
196	Model-Based Adaptation for Sample Efficient Transfer in Reinforcement Learning Control of Parameter-Varying Systems	Ibrahim Ahmed*, Marcos Quinones-Grueiro, Gautam Biswas (USA)
65	Modeling Knowledge-Based Systems Using GFP-Nets	Zbigniew Suraj* (Poland)
595	An Optimal Method for Testing Jobs' Execution in MapReduce Based Systems	Oussama Maakoul, Salma Azzouzi, Moulay El Hassan Charaf* (Morocco)
584	Moving Horizon Planning and Control under Uncertainties with Guarantees – Combining Operational Choices and Motion Primitives	Bahaaeldin Elsayed, Mohamed Ibrahim, Rolf Findeisen* (Germany)
569	Users' Emotional Experiences on E-Commerce Websites: A Study with EEG and FACS Data	Esra Özmen, Ersin Karaman, nurcan Alkış-Bayhan* (Turkey)
265	Towards the Automation of Wire Harness Manufacturing: A Robotic Manipulator with Sensorized Fingers	Andrea Andrea, Gianluca Laudante, Michele Mirto, Ciro Natale, Salvatore Pirozzi* (Italy)
334	Simulating the Dynamic Behavior of Heat Exchange	Maher Mkhinini* (Tunisia)

Session S-09: Modeling and Simulation

Session chair(s): **Ilhem Slama & Carmen Del Vecchio**

Paper ID	Title	Authors
447	Hybrid Modeling of an Adhesive Bonding Process, Case Study: Polyphenylene Sulfide	Saeideh Khatiry Goharoodi*, Jeroen Jordens, Bart Van Doninck, Guillaume Crevecoeur (Belgium)
362	Optimal Control Strategy to Reduce HIV-1 Infection in the Brain	Sofia Baiocchi, Federica Blengini, Francesca Caleno, Paolo Di Giamberardino, Daniela Iacoviello* (Italy)
340	A Consensus-Based Multi-Criteria Group Decision-Making Method Based on an Aggregated Operator Customised by Experts	José Ramón Trillo*, Francisco Javier Cabrerizo, María José Del Moral, Juan Antonio Morente-Molinera, Juan Miguel Tapia, Enrique Herrera-Viedma (Spain)
407	Model of Eukaryotic Cell Protein Control Schemes Via Manufacturing System Simulator	Esha Ranade*, Fabio Fruggier, Carmen Del Vecchio (USA)
559	Classification Type of Asynchrony Breathing Image Using 2 Dimensional Convolutional Neural Network	Nur Sa'adah Muhamad Sauki, Nor Salwa Damanhuri*, Nor Azlan Othman, Yeong Shiong Chiew, Belinda Chiew Meng Chong, Mohd Basri Mat Nor, Geoffrey Chase (Malaysia)
124 (v)	Toward interoperability of multi-agent systems on autonomous ships	Lada Males*, Dean Sumic, Marko Rosic (Croatia)

Session S-10: Image Processing and Applications

Session chair(s): **Petr Dolezel & Sergey Belikov**

Paper ID	Title	Authors
393	Noise Analysis to Guide Denoising of Scanning Electron Microscopy Images	Sheikh Shah Mohammad Motiur Rahman*, Michel Salomon, Soukalo Denbélé (France)
396	Flying Objects Classification Using Trajectory Characterization	Mohamed El Hedi Ouerteteni, Ahmed Zaafour*, Tijeni Delleji, Moez Bouchouicha, Aymen Mouelhi, Zied Chtourou, Mounir Sayadi (Tunisia)
370	Automated Dataset Enhancement Using GAN for Assessment of Degree of Degradation Around Scribe	Petr Dolezel*, Veronika Rozsivalova, Marek Pakosta, Dominik Stursa (Czech Republic)
608	Constrained Nonlinear Programming for Image-Based Hysteresis Compensation in Atomic Force Microscope Piezo Actuators	Sergey Belikov, John Alexander, and Sergei Magonov (USA)

493	Building a Vision-Based Mixed-Reality Framework for Autonomous Driving Navigation	Imane Argui*, Maxime GUERIAU, Samia Ainouz (France)
464	Implementing an FPGA System for Motion Recognition for Prosthesis Elbow	Malika KEDIR* (Algeria)

Session S-11: Learning Systems

Session chair(s): Ala' Khalifeh & Luis Ricardez-Sandoval

Paper ID	Title	Authors
647	A Review on Machine Learning-Based Customer Churn Prediction in the Telecom Industry	Sawsan Barham, Nowfal Aweisi, ALA KHALIFEH* (Jordan)
348	Online Signature Verification Using Logistic Regression	Mohammad Saleem* (Hungary)
132	Comparison of Data Cleansing Methods for Network DDoS Attacks Mitigation	Ali EL ATTAR*, Fadlallah Chbib, JAMAL Adonis, Rida KHATOUN (France)
450	Implementation of a Sudoku Puzzle Solver on a FPGA	Owen Cash*, Keith George Ciantar (Malta)
415	Application of Reinforcement Learning with Recurrent Neural Networks for Optimal Scheduling of Flow-Shop Systems under Uncertainty	Daniel Rangel-Martinez, Luis Ricardez-Sandoval* (Canada)
369	Comfort Analysis in Buildings Based on Machine Learning Methods	Mehdi HADJ SASSI*, Asma KAROUI, Mounir Ayadi, Isam SHAHROUR (Tunisia)
213	A Data-Driven Based Approach for Soil Moisture Estimation with Intermittent Measurements	Giovanni de Carolis, Andrea Gasparri* (Italy)

Session S-12: Software Engineering

Session chair(s): Nor Salwa Damanhuri & Nitin Kumar Singh

Paper ID	Title	Authors
215	On the Functional Properties of Automatically Generated Fixed-Point Controllers	Dorra Ben Khalifa*, Matthieu Martel (France)
610	Balancing Requests for Multi-Agent Distributed Servers in Augmented Reality Services	Ekaterina Moseyko* (Russia)
617	Application of Soft Computing Techniques for the Prediction of Seismic Wave Velocity	Abir Sarkar, Ankita Mazumdar, Debjit Bhowmik* (India)
276	Towards a Meta-Modeling Approach for Business Process Models Improvement Based on Ontological Analysis	Sarah Ayad* (Saudi Arabia)
162	A Blockchain-Based Modular Architecture for Managing Multiple and Quantum-Safe Encryption Algorithms	Marco Fiore*, Federico Carrozzino, Marina Mongiello, Gaetano Volpe, Agostino Marcello Mangini (Italy)
388	Deontological Ethics for Safe and Ethical Algorithms for Navigation of Autonomous Vehicles (C-NAVS) on a Highway	James Pickering*, Joshua D'Souza (United Kingdom)
562	Emotion-Based User Experience Study on E-Commerce Websites: An Experimental Study with Pulse and GSR Data	Esra Özmen*, Ersin Karaman, nurcan Alkış-Bayhan (Turkey)

Session S-13: Diagnosis and Fault Detection

Session chair(s): Bahram Shafai & Kamal Medjaher

Paper ID	Title	Authors
479	Robust Data-Driven Fault Diagnostics for Rotating Machinery Operating under Varying Working Conditions	David LATIL*, Raymond HOUÉ NGOUNA, Kamal MEDJAHHER, LHUISSET Stéphane (France)
214	Experience Feedback and Probabilistic Graphical Model for Failure Causes Isolation	Walid Mechri, Christophe Simon* (France)
21	Signal Processing and Deep Learning Based Smartwatch Photoplethysmography Data Classification of Atrial Fibrillation, Premature Atrial and Ventricular Contraction	Aaisha Javed, Muhammad Usman Akram, Norah Saleh Alghamdi* (Saudi Arabia)

229	Modeling the Health Status of a Ball Bearing for Predictive Maintenance Purposes	Elisavet Karapalidou*, Agisilaos Efraimidis, Stavros Vologiannidis, Efstathios Antoniou (Greece)
82	A Comparative Study on the Failure Detection Methods Using Time-Series Data Image Generation and CNN for Driving Module of Cobots	Seung-Hwan Choi, Jun-Kyu Park, Chang-Hyun Kim, Gunseok Park, Jongbum Park, Tae-Keun Kim, Byungjin Jung, Suwoong Lee* (Korea, South)
424	Advancing Fault-Tolerant Learning-Oriented Control for Unmanned Aerial Systems	Moh Kamalul Wafi, Rozhin Hajian, Bahram Shafai*, Milad Siami (USA)
204	Anomaly Detection for Multi-Zone Buildings Using Cluster-Trained LSTM Autoencoders	Austin Coursey*, Marcos Quinones-Grueiro, Gautam Biswas, Timothy Darrah (USA)

Session S-14: Combinatorial Optimization

Session chair(s): Sébastien Martin & Alain Quilliot

Paper ID	Title	Authors
292	Offline Power Management Strategy for Fuel Cell Electric Race Car Sizing Using Bi-Level Optimization Based Methodology	Essolizam Planté*, Mylène Delhommais, Eric Bideaux, Mathias Gerard (France)
575	A Tracking Augmented Lagrangian Method for \$ell_0\$ Sparse Consensus Optimization	Alireza Olama*, Guido Carnevale, Giuseppe Notarstefano, Eduardo Camponogara (Brazil)
429	Improving Integrated Circuit Security Using Mathematical Model Based on Clique Covering Reformulation	Jonathan Fontaine*, Mohamed Benazouz, Lilia Zaourar, Roselyne Chotin (France)
256	An Improved Tabu Search Algorithm for the Green Vehicle Routing Problem	Dalila Tayachi*, Atef Dridi (Tunisia)
381	Improved Formulations and Branch-And-Cut Algorithm for the Unrelated Parallel Machines Scheduling Problem with a Common Server and Job-Sequence Dependent Setup Times	Youssef HADHBI*, Laurent Deroussi, Nathalie Grangeon, Sylvie Norre (France)
478	A Multi-Robot Mission Planner by Means of Beam Search Approach and 2-Opt Local Search	Hamza Chakraa*, Edouard LECLERCQ, François Guerin, Dimitri Lefebvre (France)
413	Integration of Machine Scheduling and Personnel Allocation for an Industrial-Scale Analytical Services Facility	Daniela Lubke, Ricardo Fukasawa, Luis Ricardez-Sandoval* (Canada)

Session S-15: Control Design Methods (Part 2)

Session chair(s): Sergej Celikovsky & Roberd Saragih

Paper ID	Title	Authors
251	Active Disturbance Rejection Control: Tuning by PSO Considering Stability Conditions	Diego Tristán-Rodríguez*, Olga lidia Jimenez, Rubén Garrido, Efrén Mezura-Montes (Mexico)
328	Predefined-Time Tracking Control of Fixed-Wing Unmanned Aerial Vehicles Subject to External Disturbance and Unmodeled Dynamics	Qipeng Wang, Shen Lincheng Shen Lincheng, Feng Yi, Shulong Zhao, Xiangke Wang* (China)
392	Designing Proportional Delayed Integral Control for Fast Regulation in Second-Order Systems: A Geometric Approach	Julián-Alejandro Hernández-Gallardo*, Adrián Josué Guel Cortez, César Fernando Méndez-Barrios (Mexico)
484	Parameter Estimation and Indirect Adaptive Control of a Dynamically Positioned Surface Vessel	Andrei Zhivitskii*, Anton Golubev, Zakharov Dmitrii, Kirill Shabanov, Oleg Borisov, Sergei Shavetov, Anton Pyrkina (Russia)
594	The Double Inverted Pendulum with Real Mass Distribution Stabilization	Milan Anderle, Sergej Celikovsky* (Czech Republic)
326	An Explorative Study of Search Algorithms Applied to the Gain Scheduling in PID Controllers	Luis Ismael Minchala*, Michael Alexander Criollo, Luis Garza-Castañón (Ecuador)
307	Deep Reinforcement Learning for Microgrid Power Management System	Ahmed Amine Ladjici*, Ahmed Tiguercha (Algeria)

Session S-16: Energy Control

Session chair(s): Raouia Aouini & Moussa Boukhnifer

Paper ID	Title	Authors
280	On Higher-Order Averaging and Flatness	Adam Kastner*, Lutz Groell, Veit Hagenmeyer (Germany)

525	Deep Reinforcement Learning-Based Pitch Control for Floating Offshore Wind Turbines	Flavie Didier*, Salah Laghrouche, Daniel Depernet (France)
93	Torque Ripple Minimization Scheme of Synchronous Reluctance Machine for Electric Vehicle	Olaoluwa Demola ALADETOLA, Mondher Ouari, Tedjani Mesbahi, Moussa Boukhniher*, Kondo Hloindo Adjallah (France)
384	A Comparative Study on Time Series Prediction of Photovoltaic-Power Production through Classic Statistical Techniques and Short-Term Memory Networks	Juan Francisco Durán, Luis Ismael Minchala* (Ecuador)
83	Sampled-Data Observer for Supercapacitor Parameters Estimation with NEDC Cycles	Eric Magarotto*, Philippe Dorleans, Tarek AHMED-ALI (France)
515	Simulation and Control of a Continuously Cast Steel Billet in an Induction Furnace	Sohaibullah Zarghoon*, Lukaš Bartalský, Cyril Belavy (Slovakia)

Session S-17: Optimal Control (Part 1)

Session chair(s): Ilyasse Aksikas & Vadim Azhmyakov

Paper ID	Title	Authors
273	Real-Time Modification of a Spline-Based Time-Optimal Motion Trajectory with Load-Sway Reduction for Rotary Cranes	Min Set Paing*, Abdallah Farrage, Nur Azizah Amir, Hideki Takahashi, Kenichi Terauchi, Shintaro Sasai, Hitoshi Sakurai, Masaki Okubo, Naoki Uchiyama (Japan)
365	On the Approximate Optimal Feedback Control for Dynamical Systems Modeled by Ordinary Differential Equations	Vadim Azhmyakov*, Luz Adriana Guzman Trujillo, Fabian Sanchez Salazar (Colombia)
463	Flatness-Based Mixed-Integer Obstacle Avoidance MPC for Collision-Safe Automated Urban Driving	Alexander L. Gratzner*, Maximilian M. Broger, Alexander Schirrer, Stefan M. Jakubek (Austria)
46	Boundary Output-Feedback Regulation of a Catalytic Cracking Reactor	Ilyasse Aksikas* (Qatar)
483 (v)	Sequential Inverse Optimal Control of Discrete System	Sheng Cao*, Zhiwei Luo, Changqin Quan (Japan)
325	Application of Lyapunov Control for Analysis Spread of COVID-19 in Indonesia	Roberd Saragih* (Indonesia)
306	Hybrid VSC-HVDC Optimal Power Based on Evolutionary Algorithm	Ahmed Tiguercha*, Ahmed Amine Ladjici (Algeria)

Session S-18: Linear Systems

Session chair(s): Vittorio De Iuliis & Alejandro Rojas

Paper ID	Title	Authors
322	A Norm-Free Event-Triggering Architecture for Scheduling Control Data Transmissions in the Presence of Sensor Uncertainties	Deniz Kurtoglu, Tansel Yucelen* (USA)
489	Parameter Estimation of Multiple Poles by Subspace-Based Method	Prabhu Vijayan*, Philippe Dreesen, Ivan Markovsky, Mariya Ishteva (Belgium)
581	Generalized Predictive Proportional Integral Controller Design for Unstable Plant Models with Long-Dead Times	Alejandro Rojas*, Daniel G. Sbarbaro (Chile)
510	Some Remarks on the Stability of Time-Varying Discrete-Time Positive Delay Systems	Vittorio De Iuliis*, Costanzo Manes (Italy)
164	A Subspace System Identification Method for Positive Systems	Yueyang Wang, Bahram Shafai* (USA)
203	A nonlinear water level controller for reservoirs in cascade	Filipa N. Nogueira*, José L.S. Pinho (Portugal)
89	Fault Tolerant Attitude Estimation for Satellite at Low Earth Orbit	Hicham Henna*, Elhadi Gasmi, Mohamed Redouane Kafi, Mohamed Amine Sid, Moamar Sayed-mouchaweh, Houari Toubakh (Algeria)

Session S-19: Predictive Control with Applications**Session chair(s): Claudio Carnevale & Silvia Maria Zanoli**

Paper ID	Title	Authors
506	Model Predictive Control of a Highly Dynamic Parallel SCARA Robot	Branimir Mrak*, Taranjitsingh Singh, Quentin Docquier, Joris Gilis (Belgium)
281	A Set-Theoretic Receding Horizon Control Based on a Q-Learning Approach for Sustainability Purposes	Francesco Giannini*, Giuseppe Franze', Francesco Pupo, Giancarlo Fortino (Italy)
79	A Model Selection Criterion to Use Gap Metric, Stability Margin, and Model Order Reduction Tools in Control of Nonlinear Systems	Pouya Rikhtehgar, Mohammad Haeri* (Iran)
35	Predictive Control Scheme Compensation in Feed-Forward Control Scheme for Interleaved Connected PFC Power Converter System	Khalid Javed* (Belgium)
77	Model Predictive Control for Temperature Regulation of Professional Ovens	Juan Marcelo Castellino, Francesco Forte, Gianfranco Fenu, Felice Andrea Pellegrino* (Italy)
550	On the Design of Nonlinear MPC and LPVMPC for Obstacle Avoidance in Autonomous Driving	Maryam Nezami*, DIMITRIOS KARACHALIOS, Georg Schildbach, Hossam Abbas (Germany)
69	Comparative Analysis of Model-Based Predictive Control for NPC and ANPC Multilevel Converters Considering Practical Implementations	Adriano Fazolo Nardoto*, David Molinero, Emilio José Bueno Peña, Walbermark Marques dos Santos, Lucas Encarnação (Brazil)

Session S-20: Transport Optimization**Session chair(s): Sana Belmokhtar-Berraf & Maria Pia Fanti**

Paper ID	Title	Authors
156	Distributed Artificial Intelligence for Traffic Assignment in Smart Cities	Manal ELIMADI*, Abdeljalil Abbas-Turki, Abderafiaa Koukam (France)
269	Comparison of Traffic Control with Model Predictive Control and Deep Reinforcement Learning	Muhammad Imran, Riccardo Izzo, Andrea Tortorelli, Francesco Liberati* (Italy)
117	Optimal Design and Scheduling of Natural Gas Storage Facilities under Multiple Time Scales	Jinghong Peng*, Jun Zhou, Guangchuan Liang (China)
116	Trajectory Planning for Tethered Robots in Uncertain Environments	Pedro Henrique dos Santos*, Fredy Ruiz, Lorenzo Fagiano (Italy)
309	Energy Consumption of a Battery Electric Vehicle for a Comfort Ride on Moroccan Roads	Salma Ariche*, Zakaria BOULGHASOUL, ABDELHAFID El Ouardi, Abdelhadi ELBACHA, abdelouahed tajer, stéphanie Espié (Morocco)
136	Application of Traveling Salesman Problem for Logistics Relief Effort	Panchalee Praneetpholkrang*, Sarunya Kanjanawattana (Thailand)
283	A Multi-Objective Approach to Deal with International Airspace Closure/Opening in Spain in an Early-Stage Pandemic Situation	Antonio Jiménez-Martín*, Alfonso Mateos Caballero, Gabriel Peña, Arminda Moreno-Díaz (Spain)

Session S-21: Energy Control and Power Systems**Session chair(s): Jean-Yves Dieulot & Pablo Velarde Rueda**

Paper ID	Title	Authors
163	Brushless Double-Fed Induction Generator Control: Passivity with High Order Sliding Modes Control	Héctor Huerta* (Mexico)
571	Solar Energy Management System with Hybrid Battery/Supercapacitor Storage for Residential Applications	Raouia Aouini* (France)
263	Study on Minimum Annual Electricity Bill of a Campus Microgrid Using the Sparrow Search Algorithm and Bin Packing Method	WEITZER HUANG*, WEI-CHEN LIN, kaichao yao, Li Chun Li, Chang Si Huang (Taiwan, R.O.C)
389	Linear and Non-Linear Observers for Hydropower Plants with Surge Tank	Augustin Alonso*, Gérard ROBERT, Gildas Besancon (France)

139	Optimization Method for the Control Law of an Electrical Trimmable Horizontal Stabilizer Actuator Operating at Low Temperatures	Haolin MA*, Jian FU, Tianxiang XIA (China)
437	Robust Input Output Linearizing Control Augmented with Only One Hidden Layer Neural Network for Induction Motors	Hamou AIT ABBAS* (Algeria)

Session S-22: Special Session – Optimization of Healthcare Management Systems

Session chair(s): Yassine Ouazene, Fabio Fruggier, & Nhan-Quy NGUYEN

Paper ID	Title	Authors
36	Nurse Scheduling Problem Considering Workload Balance and Nurse Preferences: A Case Study in a French Hospital	yasmine alaouchiche*, Yassine Ouazene, Farouk Yalaoui, Hicham Chehade (France)
335	Enhancing the Reliability of Existing Healthcare Systems through an Optimized Investment Strategy	Isaline Baret*, Nhan Quy Nguyen, Yassine Ouazene, Farouk Yalaoui (France)
626	Intelligent Methods for Early Prediction of Heart Disease	Hamdi Al-Jamimi* (Saudi Arabia)
543	A New Simultaneous Pickup and Delivery Problem with Time Windows Using an Heterogeneous Fleet of Electric Vehicle and Considering Energy Consumption	Yves Devaux*, Oumayma BAHRI, Lionel Amodeo (France)
45	Recurrent Lassa Fever Outbreaks: Spatiotemporal Analysis and Modelling of Environmental Intervention Strategies	Sampson Akwafuo*, Ali Hussain, Christopher Ihinegbu (USA)
390	Scheduling in an Emergency Department, Linear Formulation and Heuristic Approach	Lahcene Mezouari*, Lucas Wicher, Jean-Paul Boufflet, Aziz Moukrim (France)
311	Approximate Methods for the Emergency Medical Services Optimization Models: A Literature Review	Takwa Tlili*, Krichen Saoussen, Ben Nasser Sirine (Tunisia)

Session S-23: Special Session – Advanced ICT, optimization and control for Industry 4.0

Session chair(s): Francesco Liberati & Alessandro Di Giorgio

Paper ID	Title	Authors
561	Setup, Start-Up and Data Analysis of a Multi-Compressor Control System for Cold Storage Refrigeration	Silvia Maria Zanolli*, Crescenzo Pepe, Marco Luciani (Italy)
526	Explainable Symbolic Regression Model for Tool Wear Diagnosis	Debashish Mishra, Seulki Han, Krishna Pattipati, George Bollas* (USA)
549	Uncertainty sources affecting remanufacturing business environment	FRANCESCO MANCUSI*, Fabio Fruggier, Sotirios Panagou (Italy)
397	Task Scheduling in Assembly Lines with Single-Agent Deep Reinforcement Learning	Muhammad Imran, Giovanni Antonucci, Alessandro Di Giorgio, Francesco Delli Priscoli, Andrea Tortorelli, Francesco Liberati* (Italy)
587	Modeling of Smart Batteries for the Realization of a Digital Twin Prototype	Fatemeh Taei, Mohammed Adel HAMZAOU*, Nathalie JULIEN (France)
504	Experimental Comparison of Models of the Drying-Cooling Process of Flatbreads for Optimized Automated Production: the Case Study of Carasau Bread	Diego Deplano, Mauro Franceschelli*, Carla Seatzu (Italy)
372 (V)	Comparison of Three Reconfiguration Levers to Optimize a Reconfigurable Production	Rémy Dupas*, Jean-Baptiste Clarion, Julien FRANCOIS, Igor Grebennik (France)

Session S-24: Special Session – Robotics for logistics and transportation systems

Session chair(s): Graziana Cavone & Maria Pia Fanti

Paper ID	Title	Authors
518	Reinforcement Learning and Automatic Control for Resilience of Maritime Container Ports	Davis Loose*, Timothy L. Eddy, Thomas L. Polmateer, Negin Moghadas, Daniel C. Hendrickson, James H.

		Lambert (USA)
443	Human Adaptive Tracking and Localization in Logistic Operations	Federica Pascucci, Simone Morosi, Marco Dolfi, Laura Giarre'* (Italy)
94	A Trip Planner Tool for Electric Vehicles in Long Distance Journeys	Michele Roccotelli*, Maria Pia Fanti, Agostino Marcello Mangini (Italy)
503	Towards a Long Trip Management Strategy for Electric Vehicles with Uncertain Traveling Conditions	Luis Alfredo Wulf Ribelles*, Guillaume Colin, Antoine Simon, Dominique Nelson-Gruel, yann chamaillard (France)
17	A Colored Petri Net Tool for the Design of Robotic Palletizing Cells	Graziana Cavone*, Silvia Stella, Paolo Scarabaggio, Raffaele Carli, Stefano Lisi, Achille Claudio Garavelli, Mariagrazia Dotoli (Italy)
374	Automatic Control of Drones' Missions in a Hybrid Truck-Drone Delivery System	Silvia Proia, Graziana Cavone*, Giulia Tresca, Raffaele Carli, Mariagrazia Dotoli (Italy)

Session S-25: Control of Nonlinear Systems

Session chair(s): Lale Canan Dulger & Alexandra-Iulia Szedlak-Stinean

Paper ID	Title	Authors
434	Harmonics Suppression in a Class of Switched Mechanical System: A Contraction Theory Approach	Bhabani Shankar Dey*, Udayan Banerjee, Indra Narayan Kar (India)
232	Biased Proportional Navigation with Decaying Error for 3D Impact Angle Control	Raziye Tekin*, Koray Erer (Turkey)
225	Koopman-Based Economic Model Predictive Control for Nonlinear Systems	Fahad Albalawi*, Syed Hameed (Saudi Arabia)
566	Reference Tracking Control of a Nonlinear Epidemiological Model with State Estimation	Balázs Csutak*, Gábor Szederkényi (Hungary)
51	Nonlinear Model Identification of a Ball and Beam Mechanism Using Experimental Data	Masoud Abedinifar, Seniz Ertugrul*, Serdar Hakan Argüz (Turkey)
161	On Global Asymptotic Stability of Heterogeneous Modular Networks with Three Time-Scales	Anes Lazri*, Elena V. Panteley, Antonio Loria (France)
308 (v)	Actuator Fault Tolerant Control Design for Time Delay Systems	Omayma MANSOURI , Fayçal BEN HMIDA, Anis SELLAMI (Tunisia)

Session S-26: Special Session – Models and decision support methods for logistics, transportation, and manufacturing systems

Session chair(s): Mustapha Oudani & James H. Lambert

Paper ID	Title	Authors
44	A Prescriptive Analytics Approach for Port Logistics Planning	Mustapha Oudani*, Anass Sebbar, karim zkik, Amine Belhadi (Morocco)
318	Ranking of Human Factors in the Incidence of Road Crashes Based on Fuzzy Decision-Making Technique (a Case Study in Southern Italy)	Sina Shaffiee Haghshenas*, Giuseppe Guido, Sami Shaffiee Haghshenas, vittorio astarita, Saeid Jafarzadeh Ghouschi (Italy)
320	Review of Applications of Machine Learning (ML) Approaches in Driver Behavior Analysis Using Qualitative and Quantitative Analysis	Sami Shaffiee Haghshenas, Giuseppe Guido, Sina Shaffiee Haghshenas*, vittorio astarita, Saeid Jafarzadeh Ghouschi (Italy)
52	A Multi-Criteria Decision-Making Approach for the Sustainable Location of Urban Farms: Towards Farming 4.0	Kenza Oufaska*, Doha Haloui, Mustapha Oudani, Khalid El Yassini (Morocco)
337	A Graph Neural Network Approach for Detecting Smart Contract Anomalies in Collaborative Economy Platforms Based on Blockchain Technology	Karim Zkik*, Anass Sebbar, Oumaima FADI (France)
80	Enhancing Resilience against DDoS Attacks in SDN-based Supply Chain Networks Using Machine Learning	Anass Sebbar, Karim Zkik* (France)
554	Platoon-Based Distributed Control for Automated Material Handling Systems	Alessandro Bozzi*, Jose-Fernando Jimenez, Camilo Hernandez-Rodriguez, Eliana Maria Gonzalez-Neira, Damien Trentesaux (Italy)

Session S-27: Monitoring and Supervision**Session chair(s): Eric Duviella & Joanna Staniszezwska**

Paper ID	Title	Authors
29	Augmented Flight Management System for Future Single Pilot Operations	Ali Zolghadri* (France)
494	Renovation of the Control System of a High-Pressure Water Rinsing Machine for Superconducting RF Cavities Using the UNICOS-CPC Framework	Joanna Staniszezwska*, João Rodrigo Ferreira, Gregory Pigny (Switzerland)
189	Comparative Analysis of Theoretical and Experimental Determination of Ball Mill Critical Speed Simulation	Nikolay Stoimenov* (Bulgaria)
417	Advances in Emotion Recognition for Driving: A Review of Uni-Modal and Multi-Modal Methods	Marina CHAU*, Abdelmoudjib Benterki, Christophe Portaz, Choubeila Maaoui, Moussa Boukhnifer (France)
157	Particle Filter-Based Diagnosis, Prognosis, and Health Monitoring of EMAs	Hamed Kazemi, Khashayar Khorasani* (Canada)
385	Digital Twin Development for a Quality Control Cell	Marcella Cavalcanti*, Hugo Costelha, Carlos Neves, André Martins, Luis Perdigoto (Portugal)
536	IoT-based Surveillance Camera Distribution using Triangle Geometry	Islam Almalkawi*, Loiy Al-Abed, Jamal Al-Karaki, Manel Guerrero Zapata (Jordan)

Session S-28: Multi-Objective Optimization**Session chair(s): Hongyan Li & Claudio Carnevale**

Paper ID	Title	Authors
125	Integrated Approach of Lost-Sales Costing and Service Level Constraint for Continuous-Review Inventory Control	Marco Giacomelli*, Francesco Pilati, Matteo Brunelli (Italy)
394	An Efficient Non-dominated Sorting Genetic Algorithm For Multi-objective Optimization	Abir Chaabani*, Lamjed Ben Said, Mouna Karaja (Tunisia)
661	Lateral Transshipment in Two-Echelon Inventory Control for Sustainable Pharmaceutical Supply Chain	Chaima Romdhani*, Issam NOUAOURI, Jihene Tounsi, Hamid Allaoui, Said Gattoufi (Tunisia)
92	A Fault-Tolerant Task Allocation Framework for Overactuated Multi-Robot Systems	Lorenzo Govoni*, Andrea Cristofaro (Italy)
601	Integrated Assignment and Guidance for Distributed Multi-Pursuer-Target Interception	Hong Tao, Hongyan Li, Tao Song*, Defu Lin (China)
580	Dynamic Reward in DQN for Autonomous Navigation of UAVs Using Object Detection	Adam Lagoda*, Seyedeh Fatemeh Mahdavi Sharifi, Thomas Pedersen, Daniel Ortiz-Arroyo, Petar Durdevic (Denmark)
72	Simultaneous Minimization of Energy Cost and CO2 Emissions in a Microgrid	Juana López Redondo, José Domingo Álvarez Hervás*, Luis Orlando Polanco Vasquez, Jose Luis Torres Moreno, Victor Manuel Ramirez Rivera (Spain)

Session S-29: Artificial Intelligence with Applications**Session chair(s): Sarah Ayad, Maria Zemzami & Zbigniew Suraj**

Paper ID	Title	Authors
511 (v)	A Fully Bayesian Inference Approach for Multivariate McDonald's Beta Mixture Model with Feature Selection	Darya Forouzanfar*, Narges Manouchehri, Nizar Bouguila (Canada)
131	Comparative Analysis of Machine Learning Algorithms for Classification of Thai Fake News	Phumchai Siriphanpornchana, Sarunya Kanjanawattana* (Thailand)
172	Weighted Classification Model to Predict Traffic Accident Severity	Mohamed MOUAICI*, Frédéric Royet (France)
41	Architectural Design of Metadata Management Tool	Soňa Karkošková* (Czech Republic)

297	Reverse Engineering of Feedback Control Systems and Classification of Resistance Spot Welding Times Using Random Forest in Automotive Body-In-White Manufacturing	Jan Michael Spoor*, Dawid Stade, Jivka Ovtcharova, Martin Manns (Germany)
314 (v)	Sentiment Analysis Using Smoothed Probabilistic-Based Models	Fatma Najar*, Nizar Bouguila (Canada)
282	Ugly Duckling Concept for Melanoma Detection: A PCA-Based Outlier Detection Method with CNN-Based Feature Vectors	Jinen Daghrir*, Lotfi Tlig, Moez Bouchouicha, Nouredine Litaïem, Faten Zeglaoui, Mounir Sayadi (Tunisia)

Session S-30: Robotics (Part 1)

Session chair(s): Daniel Condurache & Marvin Bugeja

Paper ID	Title	Authors
467	Reactive and Human-In-The-Loop Planning and Control of Multi-Robot Systems under LTL Specifications in Dynamic Environments	Pian Yu*, Gianmarco Fedeli, Dimos V. Dimarogonas (United Kingdom)
532	Implementation of an Adaptive Control Algorithm on a Six DOF Robot Manipulator	Muhammet Umut Daniş*, Zeki Yagiz Bayraktaroglu (Turkey)
624	Data-Driven Feedback Linearizing Controller for Robotic Manipulators with Uncertain Dynamics	Udayan Banerjee*, Indra Narayan Kar, Subir Kumar Saha (India)
339	Multi-output Identification and Robust Control of a Two-Wheeled Robot	Tsonyo Slavov, Jordan Kravlev, P.Hr. Petkov* (Bulgaria)
357	A Row Following Algorithm for Agricultural Multi-Robot Systems	Arianna Rana, Annalisa Milella, Antonio Petitti* (Italy)
296	Robot-Assisted Gait Trajectory Optimization Using the User-Centric Lower Extremity Training Platform	Shamanth Shanmuga Prasad, YoungWoo Kim* (Korea, South)

Session S-31: Graphs and Networks

Session chair(s): Dimos Dimarogonas & Alain Quillio

Paper ID	Title	Authors
485	Community-Augmented Local-Link Intensity: A Score for Anomaly Detection in Graphs	Theodor-Adrian Badea, Bogdan Dumitrescu* (Romania)
216	Communication Behavior Analysis to Understand Employee Attrition	Korichi Abdel-Rahmen*, Hamamache KHEDDOUCI, Taha Tehseen (France)
197	Associations between Social Media Attributes for Demand Forecasting of New Products	Yvonne Badulescu*, Khelil Kassoul, Naoufel Cheikhrouhou (Switzerland)
313	A Graph Matching Approach by Aggregated Search	Farid KACIMI*, Hamamache KHEDDOUCI, Abdelkamel TARI (France)
572	On Buffer Centering for Bittide Synchronization	Sanjay Lall*, Calin Cascaval, Martin Izzard, Tammo Spalink (USA)
247	Alternate Testing Strategy for Unavailability Analysis of Multi-State Safety System	Walid Mechri, Christophe SIMON*, Wahbi Rajhi (France)
201	Bearing-Only Formation Control for Double Integrators and Non-Holonomic Agents with Elevation-Angle Rigidity	Chinmay Garanayak*, Dwaipayan Mukherjee (India)

Session S-32: Scheduling Problems

Session chair(s): Lionel Amodeo & Mohammadmohsen AGHELINEJAD

Paper ID	Title	Authors
206	A Multi-Stage Model for Sustainable Scheduling in a Hybrid Flow Shop	Lingxin Wang*, Rosa Abbou, Catherine Da Cunha (France)
56	An Efficient A* Like Algorithm for the Scheduling of Unit-Time Jobs with Release and Due Dates under Non Idling Constraints	Alain Quilliot* (France)
432	Optimization of the Electronic Queuing System Based on the LJSF Online Scheduling Algorithm	Elizaveta Tarasova* (Russia)
342	An ILP for Scheduling Rolling Stock Maintenance Activities under Operational and Logistical Constraints	Pietro Folco* (France)

514 (v)	Energy-Efficient Multi-Objective Hybrid Flowshop Scheduling Problem with Blocking Constraints	Ahmed Missaoui*, Cemalettin Ozturk, Barry O'Sullivan (Ireland)
42	Rescheduling of a Single Machine Problem Thanks to Time Dependent Variable Weights	Ayoub TIGHAZOU*, Christophe Sauvey, Nathalie Sauer, Bertrand Rose (France)
236	Distributed Cooperative Task Planning for Autonomous Mobile Robots in Intralogistics	Xiang Chen*, Steven Liu (Germany)

Session S-33: Prediction and Supervision in Control and Engineering

Session chair(s): Adolfo Perrusquia & Taranjit Singh

Paper ID	Title	Authors
502	An Alternative Hybrid Super-Twisting Differentiator for a Motor Control System	Shabnam Shakourzadeh, Giammarco Tonti, Corrado Guarino Lo Bianco* (Italy)
497	A Comprehensive Method for Measuring Flexibility at the Individual and Global Levels: A Case Study in the Automotive Industry	Anthony CHEHAMI, Armand BABOLI*, Eva ROTHER, Behnam EINABADI, Mojtaba EBRAHIMI (France)
97	Prediction of Hotspots in Injection Moulding by Using Simulation, In-Mould Sensors, and Machine Learning	Mandana Kariminejad*, David Tormey, 29aifeng29her O'Hara, Marion McAfee (Ireland)
8	A Two-Stages Unsupervised/Supervised Statistical Learning Approach for Drone Behaviour Prediction	Singh Gurpreet, Adolfo Perrusquia*, Weisi Guo (United Kingdom)
333	Towards an ontology-based fault detection and diagnosis framework – a semantic approach	László Nagy*, Ruppert Tamas, Abonyi Janos (Hungary)
409	A Region-Based Approach to Monocular Mapless Navigation Using Deep Learning Techniques	ZAKARIAE MACHKOUR*, Daniel Ortiz-Arroyo, Petar Durdevic (Denmark)
153	Approximate Model Predictive Control Based on Neural Networks in a Cloud-Based Environment	Joshua Adamek*, Sergio Lucia (Germany)

Session S-34: Discrete Event Systems

Session chair(s): Dimitri Lefebvre & Carla Seatzu

Paper ID	Title	Authors
271	Mode Recognition in Attack Graphs Based on Conditional State Probability	Omar Amri, Dimitri Lefebvre* (France)
277	Energy Aware Strategy for Discrete Event Systems Using Inhibitor P-Time Petri Nets and Deep Reinforcement Learning	Patrice Bonhomme, Clément Lecomte* (France)
191	PLCs Training in Hybrid Mode Using the PLC3000 Solution: Feedback and Analysis from Students	Eric Duviella*, Cedrick Beler, Noury bouraqadi (France)
500	Enforcing the Opacity of Modular Discrete Event Systems using Supervisory Control	Nour Elhouda SOUID*, Kaïs KLAI, Chiheb Ameur Abid, Samir BEN AHMED (France)
547	Surgical Scheduling Based on Timed Coulored Petri Nets and (max, +) Algebra	Oumaima BOULKHOUGH*, El houcin Chakir El Alaoui, Ahmed Nait-Sidi-Moh (France)
655	Verification of Current State Opacity Using Switching Output Automata	Tianyu Liu*, Carla Seatzu, Alessandro Giua (Italy)
50	Representation of Time Petri Nets Using Interval Weighted Automata	Berangere Daviaud*, Sébastien LAHAYE, Mehdi Lhommeau, Jan Komenda (France)

Session S-35: Applied Control Design Methods

Session chair(s): Enrique Barbieri & Kentaro Hirata

Paper ID	Title	Authors
327	Power Assisting Control System for Electric Bicycles Based on Simple Adaptive Control	Kazuyoshi Hatada*, Kentaro Hirata (Japan)
476	Differential Braking Based Controller for Mitigating Un-Tripped Rollover in a Heavy Commercial Road Vehicle	Remya Sukumaran, Harshal Patil, Shankar Subramanian* (India)
165	Design of Adaptive PID Controllers Subject to Process Constraints	Vassilios Tzouanas, Enrique Barbieri* (USA)
541 (v)	In-Depth Analysis and Creation of Vital Alerts System for Offshore Submerged Work	Felipe Seabra D' almeida, William de Souza*, F. Gonçalves, F. Ribeiro Henriques, F. C. Gouvea (Brazil)

234	A Bounded E-Modification Applied to Adaptive Control of Servo Systems	Olga lidia Jimenez*, Rubén Garrido (Mexico)
133	Daisy Chaining Kalman Filter Control Allocation	Wissam Sayssouk*, Rodolfo Orjuela, Mario Cassaro, Clément Roos, Michel Basset (France)
418	Adaptive Control for High-Performance Trajectory Tracking in Multirotor UAVs	Salvatore Meraglia*, Giovanni Gozzini, Shang Liu, Davide Invernizzi (Italy)

Session S-36: Special Session – Learning methods in modeling and control of robotic systems

Session chair(s): Paolo Di Lillo & Ecker Lukas

Paper ID	Title	Authors
244	Enhanced 6D Pose Estimation for Robotic Fruit Picking	Marco Costanzo, Marco De Simone, Sara Federico, Ciro Natale*, Salvatore Pirozzi (Italy)
386	Comparison of Deep Reinforcement Learning-Based Guidance Strategies under Non-Ideal Conditions	Sevket Utku Aydinli*, Ali Turker Kutay (Turkey)
465	Data-driven control and transfer learning using neural canonical control structures	Lukas Ecker*, Markus Schöberl (Austria)
304	Teaching a Robot to Toss Arbitrary Objects with Model-Based Reinforcement Learning	Niccolo' Turcato*, Alberto Dalla Libera, Giulio Giacomuzzo, Ruggero Carli (Italy)
209	Model-Based Learning Controller Design for a Furuta Pendulum	Daniel Nikovski*, William Yerazunis, Abraham Goldsmith (USA)
141	When Local Optimization Is Bad: Learning What to (Not) Maximize in the Null-Space for Redundant Robot Control	Giacomo Golluccio*, Paolo Di Lillo, Alessandro Marino, Gianluca Antonelli (Italy)
704	DDS-Based ADAPTIVE CRUISE CONTROL	Najood Hamoud Alshammari*, Anas Alroubaiey, Basem Almadani

Session S-37: Optimal Control (Part 2)

Session chair(s): Eli Gershon & Naoki Uchiyama

Paper ID	Title	Authors
198	Application of Stochastic Zero-Order Output-Feedback to Flight Control Systems	Eli Gershon* (Israel)
74	An Application of Pontryagin Neural Networks to Solve Optimal Quantum Control Problems	Nahid Dehaghani*, A. Pedro Aguiar (Portugal)
143	Optimization of External Stimuli for Populations of Theta Neurons Via Mean-Field Feedback Control	Roman Chertovskih*, Nikolay Pogodaev, Maxim Staritsyn, Joaquim Da Silva Sewane, A. Pedro Aguiar (Portugal)
531	Motion Control of Beat up Mechanism: GA-PID Implementation	Lale Canan DULGER*, Halil İbrahim Çelik, Mehmet Topalbekiroğlu (Turkey)
425	Indefinite Risk-Sensitive Control for a Class of Nonlinear Systems	Mashael Algoulity*, Bujar Gashi (United Kingdom)
363	A Novel Approach for Production Quality Improvement in Textile Industry: A TOPSIS-Based Assignment Model	CHAKIB MECHERI*, Yassine Ouazene, Nhan Quy Nguyen, Farouk Yalaoui, Thierry Scaglia (France)
657	Self-Tuning PID based on Genetic Algorithm for the Position Control of a Biomedical Actuator	Imen Saidi*, Ines Mahmoud (Tunisia)

Session S-38: Process Control

Session chair(s): Lale Canan Dulger & Ixbalank Torres

Paper ID	Title	Authors
310	Discrete-Time Extremum Seeking Control Applied to a Fermentation Process	Ixbalank Torres Zúñiga*, Fernando Lopez-Caamal, Héctor Hernández-Escoto (Mexico)
567	Robust Multivariable Model Reference Adaptive State Feedback Output Tracking Control: An Offshore Produced Water Treatment Case Study	Mahsa Kashani, Stefan Jespersen, Zhenyu Yang* (Denmark)
378	Selectivity and Yield Evaluation in the Design of Control Systems for a Type of Parallel Reaction Carried Out in a Tubular Reactor	Isai Garcia*, Denis Cantú-Lozano, Guadalupe Luna Solano, Galo Rafael Urrea-García (Mexico)

379	Effect of Control Design on Yield and Selectivity for Multiple Reactions in a Tubular Type Reactor	Magdalena Manica*, Guadalupe Luna Solano, Denis Cantú-Lozano, Galo Rafael Urrea-García (Mexico)
179	Macroscopic Dynamic Modeling of Metabolic Shift to Lactate Consumption of Mammalian Cell Batch Cultures	Guilherme Araujo Pimentel*, Laurent Dewasme, Fernando N. Santos-Navarro, Adrien Boes, François Côte, Patrice Filée, Alain Vande Wouwer (Belgium)
520	Adaptive Kalman Filter for On-Line Spectroscopic Sensor Corrections	Daniel G. Sbarbaro*, Tor Arne Johansen, Jorge Yañez (Chile)
144	Binary Hypotheses Test for Degradation Process and Reliability Improvement Used Wald Test	Med Hedi MOULAH* (Tunisia)

Session S-39: Artificial Intelligence

Session chair(s): Nor Azlan Othman & Miyamoto Ryusuke

Paper ID	Title	Authors
4	A Pre-Distillation Strategy for Object Detection Task	Yu-Chen Lin*, Wen-Hui Chen, Hung-Cheng Chen, Chia-Hung Wang (Taiwan, R.O.C)
102	CloverNet: A Real-Time Network for Semantic Segmentation Onboard Edge Devices towards Planetary Exploration	Damiano Gasperini*, Watcharawut Masawat, Shreya SANTRA, Kazuya Yoshida (Italy)
470	Evaluating Regression Models with Partial Data: A Sampling Approach	Farhad Pourkamali-Anaraki*, Mohammad Amin Hariri-Ardebili (USA)
106	A Privacy-Preserving Federated Learning for IoT Intrusion Detection System	Riadh Ben Chaabene*, Darine Ameyed, Fehmi Jafer, Alexis Roger, Aimeur Esma, Mohamed Cheriet (Canada)
345	Driving Style and Road Characteristics from a Motion Sickness Perspective Using a Methodology Based on Clustering	Jon Ander Ruiz Colmenares*, Estibaliz Asua (Spain)
501	Enhancing Brain MRI Classification through a Hybrid Machine Learning Methodology	Jawad Haider, Muhammad Fayaz*, Muhammad Shuaib Qureshi (Kyrgyzstan)
419	DeepCNN-DTI: A Deep Learning Model for Detecting Drug-Target Interactions	Wiem Ben Ghazzi, Abir Chaabani, Zahra Kodja*, Lamjed Ben Said (Tunisia)

Session S-40: Robotics (Part 2)

Session chair(s): Daniel Condurache & Nor Salwa Damanhuri

Paper ID	Title	Authors
557	Educational Mobile Robot Equipped with Intelligent Camera Huskylens	Nayden Chivarov* (Bulgaria)
373	Two-Stage Time-Optimal Planning of Robots Along Pre-Scribed Paths with Integral Optimization of Redundancy	Federica Storiato*, Enrico Ferrentino, Pasquale Chiacchio (Italy)
456	A Graph-Optimized SLAM with Improved Levenberg-Marquardt Algorithm	Kang Zhang, Chao-Yi Dong*, liangliang Gao, Jianfei Zhao, Fu Hao, Shuai Xiang (China)
349	Efficient UAV Autonomous Navigation with CNNs	Daniel Ortiz-Arroyo*, Petar Durdevic, Martin Lauersen, Kamil Wojciech Mikolaj, Tomer Tchelet (Denmark)
430	Advancing Autonomous UAV Target Localization in GPS-Denied Environments	Axel Dawne*, Yul Yunazwin Nazaruddin, Raisal Pradipta Wardana, Azhar Ikhtiarudin, Irina Mardhatillah, Ihsan Muhammad Fauzan (Indonesia)
540	A Multi-Robot Allocation Scheme for Coverage Control Applications with Multiple Areas of Interest	Rachael N. Duca*, Marvin K. Bugeja (Malta)
427	Improvement of Visual Odometry Based on Robust Feature Extraction Considering Semantics	Miho Adachi*, JunFeng Xue, Kazufumi Honda, Marin Wada, Ryusuke Miyamoto (Japan)

Session S-41: Artificial Intelligence Approaches

Session chair(s): Nathalie Al Makdessi & Abed Al Raoof Bsoul

Paper ID	Title	Authors
428	Dataset Generation for Semantic Segmentation from 3D Scanned Data Considering Domain Gap	Marin Wada*, Miho Adachi, Yuriko Ueda, Ryusuke Miyamoto (Japan)

113	A Combined Learning Based Classifier Using Decision Tree and Logistic Regression	Seong-Jun Kim*, Jihee Kim (Korea, South)
521	Design of an Automatic Subtype Classifier of Breast Carcinoma Using XresNet with Cyclic Scheduling	Vivek Harshey*, Amar Partap Singh Pharwaha (India)
556	Is the DISST Applicable to a Malaysian Cohort?	Mohd Hussaini Abbas, Sarah Addyani Shamsuddin, Nor Azlan Othman*, Nor Salwa Damanhuri, Belinda Chiew Meng Chong, Nur Sa'adah Muhamad Sauki, Samsul Setumin, Mastura Mohd Sopian, Yeong Shiong Chiew, Geoffrey Chase (Malaysia)
32	Automated Multimodal Brain Tumor Classification Using a YOLOv7 Approach	Berlin Shaheema S, Naresh Babu Muppalaneni* (India)
545	Classification and Prediction of Overloaded Trucks Passing the Southbound Lane of North-Luzon Expressway Using Artificial Neural Network	Ahdrian Camilo Gernale* (Philippines)
530	Privacy Calculus and Personal Data Disclosure: Investigating the Roles of Personality Traits	Saleh Alwahaishi*, Zulkurnain Ali, Mohammad Saad Al-Ahmadi, Ibrahim Al-Jabri (Saudi Arabia)

Session S-42: Sensors and Instrumentation

Session chair(s): Xinyao Hu & Zouhair Haddi

Paper ID	Title	Authors
350	Low-Cost System for Foot Plantar Pressure Distribution Sensing and Gait Phase Detection	32aifeng zheng, Wenyue Zhang, GaoFeng Deng, peng yue, xinyao hu* (China)
492	An Algorithm to Ascertain Driver Braking Intent and Fault with an Electronic Brake Pedal	Mahesh Jakka, Chitrartha Dixit, Pavel Gaurkar, Gunasekaran Vivekanandan, Sriram Sivaram, Shankar Subramanian* (India)
195	IoT Gas Sensors Array for Unobtrusive Tracking of Cooking Activity	Zouhair Haddi*, Joshua Llano , Miquel Alfaras , Daniel Marín, Alexandre Perera-Lluna, Alberto Fernández, Xavier Llauradó, Narcís Avellena, Jordi Fonollosa, and Eduard Llobet (Spain)
287	Vision-Based Geolocation of Ground Target Using On-Board Gimbal Camera of UAV	Jaemin Kim, SuHyeon Kim, Dongwon Jung* (Korea, South)
138	Design and Deployment of Dissolved Oxygen Remote Monitoring and Control for the Environmental Agency Using IoT	Magdi Nabi* (United Kingdom)
147	Product of Exponential Formula of Multidual Quaternions and Higher-Order Kinematics	Daniel Condurache* (Romania)
177	On motion artifacts arising when integrating inertial sensors into loose clothing such as a working jacket	Michael Lorenz*, Rebecca Keilhauer, Takayuki Akiyama, Takehiro Niikura, Didier Stricker, Bertram Taetz, Gabriele Bleser (Germany)

Session S-43: Signal Processing

Session chair(s): Aydin Akan & Malika KEDIR

Paper ID	Title	Authors
278	Development of Shear Force Estimation Method by Vibration Measurement Using a Piezoelectric Wire Sensor	Kosei Higuchi*, Yuhi Asanuma, Sora Takahashi, Jun Inoue (Japan)
49	Detection of Alzheimer's Dementia Using Intrinsic Time Scale Decomposition of EEG Signals and Deep Learning	Sena Yagmur Sen, Ozlem Karabiber Cura, Aydin Akan* (Turkey)
535	Optimizing the Performance of Kalman Filter and Alpha-Beta Filter Algorithms through Neural Network	Junaid khan*, Eunkyu Lee, Kyungsup Kim (Korea, South)
405	Design and Development of a Knee Rehabilitation Exoskeleton with Four-Bar Linkage Actuation	Chandra Yuvesh Aubeeluck*, Sebastian Kölbl, Dmitrii Dobriborsci, Wolfgang Aumer (Germany)
551	Assessment of Muscle Fatigue Using Phase Entropy of sEMG Signals during Dynamic Contractions of Biceps Brachii	Sowmya Sundar*, Shib Sundar Banerjee, Ramakrishnan Swaminathan (India)

442	Polyneuropathy Early Detection based on Electrodermal Activity Features and Support Vector Machines	Jaouher Ben Ali* (Tunisia)
448	Myoelectric Signal Analysis and Processing in View Hand Muscle Movement Detection	Malika KEDIR* (Algeria)

Session VS-06: Forecasting in Control and Engineering

Session chair(s): Jyotindra Narayan & Milka Uzunova

Paper ID	Title	Authors
512	Data-Based Solar Radiation Forecasting with Pre-Processing Using Variational Mode Decomposition	Saida EL BAKALI, Hamid Ouadi*, Fouad Giri, Saad GHEOUANY, Jamal El-bakkouri (Morocco)
268	Gradient Boosting Approach to Predict Zero Carbon Achievement of Households in Kitakyushu*	Nitin Kumar Singh*, Takuya Fukushima, Masaaki Nagahara (Japan)
260	Adaptive Model-Free Control for Robust and Dynamic Management of Perishable Products	Danielle NYAKAM NYA*, Hassane Abouaissa (France)
623	Nonlinear combination of time-series forecasting models, a case study with ARIMA and Prophet	Zoltán Nagy* (Romania)
55	Dynamic Mode Decomposition for the Environmental Forecasting Tasks	Takwa Omri*, Asma Karoui, Didier Georges, Mounir Ayadi (Tunisia)
98	Multi-Level Fusion of Multi-Source Information Based Deep Learning and Ensemble Deep Learning Models	Hiba Chelabi*, Mohamed Tarek Khadir, Belkacem Chikhaoui (Algeria)
319	Optimized Sliding Control Based on Firefly Algorithm for Rigid Robot Manipulator	Hatem Tlijani* (Tunisia)

Session VS-07: Intelligent Systems

Session chair(s): Peter Panfilov & Rahib Abiyev

Paper ID	Title	Authors
290	Industry 4.0: Digital Twin's Industrial Applications	Heni Zribi*, Abdelkarim Elloumi, Yasmina HANI, Abderrahman El mhamedi (Tunisia)
474	Computationally Light Spectrally Normalized Memory Neuron Network Based Estimator for GPS-Denied Operation of Micro-UAV	Nishanth Rao*, Suresh Sundaram, Varun CR (India)
28	Automatic Detection and Reduction of Compensation in Stroke Patients During Robotic Rehabilitation	Siqi Cai, Longhan Xie* (China)
338	Bearing Information-Based Trajectory Planning for Window Traversal	MIDHUN E K*, Ashwini Ratnoo (India)
34	Evaluation of the GOOSE Protocol in an Energy Distribution Network through Wireless Private 4G	Ricardo Serra Simoes Junior* (Brazil)
54	A Multi-agent Reinforcement Learning-Based Approach for UAV-assisted Vehicle-to-Everything Network	Aqeel Thamer Jawad* (Iraq)
341	Bézier Curve Based Guidance for Autonomous Landing of Quadrotor	AMIT SHIVAM*, Neon S, Ashwini Ratnoo (India)

Session VS-08: Artificial Intelligence

Session chair(s): Luis A Marquez-Martinez & Sondes Ajili

Paper ID	Title	Authors
60	Combining MLP and Feature Engineering to Predict Avalanche Severity	Mounira Sassi*, Hanen Idoudi, Khadija Bousselmi (Tunisia)
148	Detection and Classification of Knee Ligament Pathology Based on Convolutional Neural Networks	Stefan-Vlad Voinea*, Ioana Andreea Gheonea, Dan Selisteanu, Rossy Teica, Lucian Mihai Florescu, Cristina Mihaela Ciofiac, Raluca Elena Nica (Romania)
224	Adoption of Big Data and AI in UAE SMEs in Unpredictable Environment	Vivek Kumar Shrivastava*, Sadia Riaz (United Arab Emirates)

237	Multistep Hyperparameter Tuning Via Reinforcement Learning for Simulated Annealing	Hiroshi Yoshitake*, Takuya Okuyama, Yudai Kamada, Taisuke Ueta, Junya Fujita (Japan)
291	ChatGPT vs Sarcasm – How Well Do State of the Art Language Models Handle Sarcasm?	Costin Baroiu*, Stefan Trausan-Matu (Romania)
377	A Prospective Disrupting Effect of Three-Dimensional Body Scanning Enabled Technology on the Downstream Garment Supply Chain	Arij Lahmar* (United Arab Emirates)
605	Rendering Involved and Machine-Learning-Based Environment Interpretation Applying Depth Estimation	Kunbum Park*, Takeshi Tsuchiya (Japan)

Session VS-09: Control Applications

Session chair(s): Alessandro Piloni & José Boaventura

Paper ID	Title	Authors
134	A Computationally and Data-Efficient Reference Slip Estimation Algorithm for Antilock Brake System	Shravan Devadiga, Pavel Gaurkar, Gunasekaran Vivekanandan, Sriram Sivaram, Shankar Subramanian* (India)
471	A Robust Wheel Slip Controller for 4-Wheel Drive Electric Vehicle Using Integral Sliding Mode Control	Jamal El-bakkouri*, Hamid Ouadi, Mohamed Khafallah, Abdelaziz EL AOUMARI, Abdallah Saad (Morocco)
279	Production of Parts from Metal Powder – Powder Characteristics	Dimitar Karastoyanov*, Todor Penchev, Vladimir Monov (Bulgaria)
529	An Efficient Fixed-Time Filter for Backstepping Attitude Control of Quadcopter	Truong-Dong Do*, Xuan Mung Nguyen, Yong-Seok Lee (Korea, South)
259	Aircraft Jet-Engine Exhaust Nozzle with Pneumatic-Hydraulic Control Unit	Alexandru Tudosie* (Romania)
628	Experimental Validation of Quadruple Tank System Using STM32 Microcontroller	ANUJ JOSHI*, ARCHANA THOSAR (India)
597	Nonlinear Observer for Quadrotor Waypoint Navigation Using Only Range Measurements	Mahmood Rezaee Qotb Abadi, Luis Rodrigues* (Canada)

Session VS-10: Control Design Methods

Session chair(s): Petko Petkov & Lale Canan Dulger

Paper ID	Title	Authors
262	H_{∞} Control of One Class of Bilinear Positive Continuous-Time Systems	Dusan Krokavec*, Anna Filasova (Slovakia)
509	Robust Data-Driven Stabilization with Mixed Performance Guarantees	Mousumi Mukherjee, Vikas Kumar Mishra, Naim Bajcinca* (Germany)
75	A new combined controller for an industrial heavy-duty 3D overhead crane system with load hoisting or lowering	Yi Zhang, Niu Dan*, Qi Li, Minghao Liu, Chen Xisong, Mei Zhang (China)
68	PID Controllers in the Trajectory Tracking Control Problem of Robotic Manipulators with Time-Delayed Feedback	Aleksandr Andreev*, Katherine Sutyorkina, Lubov Kolegova (Russia)
449	Contribution in Modelling and Control of Traffic Flow System Using Bond Graph	Milka Uzunova*, Alexander Grantcharov, Konstantin Dimitrov, Rositsa Velichkova (France)
598	Combining 3D Planning and Control Barrier Functions for Safe Motion of Quadrotor UAVs among Obstacles	Andrea Cristofaro, Marco Ferro, Flavio Galasso, Mirko Mizzoni, Adriano Pacciarelli, Marilena Vendittelli* (Italy)
112	Analysis of Frequency-Robust Multivariable Dynamical Systems under Parametric Perturbations	Roman Omorov, Akylai Akunova, Taalaibek Akunov* (Kyrgyzstan)

Session VS-11: Control Theory

Session chair(s): Bijoy Ghosh & Fatma Abdelhedi

Paper ID	Title	Authors
660	Mountaineering Team-Based Optimization approach for solar cell model parameter	Ahmed JERIDI*, Jawher Chroua, Abderrahmen ZAAFOURI (Tunisia)

	identification	
398	The State-Space Representation of MIMO LTI Systems Using the Future Inputs Elimination Approach	Nermin Covic, Almir Salihbegovic* (Bosnia and Herzegovina)
513	Induction Motor Current Control with Torque Ripples Optimization Combining a Neural Predictive Current and Particle Swarm Optimization	HASSAN RAFIA*, Hamid Ouadi, Brahim Elbhiri (Morocco)
568	Bearing and Distance Formation Control of Rigid Bodies in $SE(3)$ with Bearing and Distance Constraints	Sara Mansourinasab*, mahdi sojoodi, Reza moghadasi (Iran)
110	Thermal Monitoring of Transformer Via Finite Time Parameter Estimator	Mohd Yaqub Shaikh*, Devangee Bhurawalla, Revati gunjal (India)
451	The Extended Optimal Control Problem and Numerical Techniques of Its Solving	Askhat Diveev* (Russia)
570	Robust Gait Tracking Control of a Pediatric Exoskeleton System: An Adaptive Non-Singular Fast Terminal Sliding Mode Approach	Jyotindra Narayan*, Santosha K. Dwivedy (India)

Session VS-12: Software Engineering

Session chair(s): Denis Chikurtev & José Machado

Paper ID	Title	Authors
564	Exploring Coexistence of Software Architecture Development and Agility through a Multivocal Literature Review	Gülşah Kırtıloğlu, Özden Özcan-Top* (Turkey)
169	The Impact of Grid Search on Bug Resolution Prediction for Open-Source Software	Chaymae Miloudi, Laila Cheikhi*, Ali Idri, Alain Abran (Morocco)
194	Bug Resolution Prediction for Open-Source Software using Ensembles of Instance Selection Algorithms	Chaymae Miloudi, Laila Cheikhi*, Ali Idri, Alain Abran (Morocco)
239	Mining Association Rules for a Sustainable Supply Chain Using Improved MultiObjective Crystal Structure Algorithm	Salma Yacoubi*, Ghaith Manita, Ouajdi KORBAA (Tunisia)
317	Area Filtering Method Is Used to Control and Improve the Detection of Shape Edges in Images	Boulbaba Guedri*, Naji Guedri, Gharbi Rached (Tunisia)
218	Multi-Agent Economic Modeling Automation Technologies	Aleksandra Zhukova*, Nikolay Pilnik, Ivan Kamenev, Batyrzhan Iusup-Akhunov (Russia)
352	Control of SCARA Robot and Rotary Table in ROS and Gazebo As Part of a Cyber-Physical System	Denis Chikurtev* (Bulgaria)

Session VS-13: Image Processing

Session chair(s): Donia Ammous & Dorel Aiordachioaie

Paper ID	Title	Authors
355	Evaluation of the Improvement in Hierarchical Lossless Video Compression	Donia Ammous*, Amina Ksontini, Khelif Naziha, Fahmi Kammoun, Nouri Masmoudi (Tunisia)
233	Automatic Diagnosis of Pectus Excavatum from CT Images using a Joint CNN-LSTM Model	Yizhi Liao, Haiyu Zhou, Longhan Xie, Siqi Cai* (Singapore)
70	Performance Comparison of Machine Learning Methods Based on Convolutional Neural Network for Satellite Imagery Classification	Slimani Nawel, Imen Jdey*, Khirallah Mongi (Tunisia)
404	Detecting and Classifying Surface Defects in Rolled Steel Sheets Using Deep Learning Techniques	Oleg Evstafev*, Sergei Shavetov (Russia)
517	Blind Watermarking/Encryption Schema for Security Medical Image Applying DWT-SVD-AES-Chaos Combination	Sondes Ajili*, Mohamed Ali Hajjeji, Abdellatif Mtibaa (Tunisia)
395	A Temporal Human Activity Recognition Based on Stacked Auto Encoder and Extreme Learning Machine	Mariam Gnouma*, Ridha Ejbeli, Mourad Zaied (Tunisia)

231	Garbage Classification Based on Fine-Tuned State-Of-The-Art Models	Ramil Shukurov* (Azerbaijan)
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Session VS-14: Nonlinear Systems

Session chair(s): Andrzej Bartoszewicz & Binoy Krishna Roy

Paper ID	Title	Authors
39	Stability Analysis of Nonlinear Switched Systems with Mode-Dependent Event-Triggered Mechanism	Peilin Yu, Feiqi Deng* (China)
81	Analysis Method for Parameter Sensitivities of Periods in Rhythm Phenomena –Sensitivity and Adjoint Equations	Yasuaki Kuroe*, Yoshihiro Mori (Japan)
387	3D Trajectory Tracking of a Quad-Rotor Unmanned Aerial Vehicle via the First Order Sliding Mode Control	Almir Salihbegovic*, Azra Talic, Nedim Osmic, Emir Sokic (Bosnia and Herzegovina)
323	Consensus-Based Leader-Follower Formation Tracking for Control-Affine Nonlinear Multiagent Systems	Clinton Enwerem*, John S. Baras (USA)
588	Robust Actuator Fault Reconstruction for Uncertain Time-Delay One-Sided Lipschitz Nonlinear Systems Based on a New Sliding Mode Observer	Amal NASRI*, Iskander Boulaabi, Anis SELLAMI, Fayçal BEN HMIDA (Tunisia)
95	Dynamic Mode Decomposition and Koopman Operator for Iterated Function Systems	Ramen Ghosh*, Mahmoud Tahmasebi, Marion McAfee (Ireland)
99	Vibration Control for a Second-Order System Via a Magnetorheological Damper	Andrés Rodríguez-Torres*, Jesús Morales Valdez, Wen Yu, Jesús David Avilés (Mexico)

Session VS-15: Optimal Control

Session chair(s): Ivan Samylovskiy & Askhat Diveev

Paper ID	Title	Authors
619	Model Predictive Control-Based Guidance with Impact Angle Constraints for Visual Quadrotor Interception	Ahmet Talha Cetin*, Emre Koyuncu (Turkey)
184	Machine Learning Control Synthesis by Symbolic Regression for Avoidance of Arbitrary Positioned Obstacles	Elizaveta Shmalko*, Askhat Diveev (Russia)
73	Adaptive DC Link Voltage Controller in PV Grid Connected under Two-Stage Transformerless Configuration	Fethi Messaoudi*, Fethi FARHANI, Abderrahmen ZAAFOURI (Tunisia)
635	Study of Numerical Methods for Solving Optimal Control Problem for a Group of Robots	Askhat Diveev*, Elena Sofronova (Russia)
108	Numerical Method for Complete Solution of the Optimal Control Problem	Askhat Diveev* (Russia)
634	Optimal Control Problems and Cross-Platform Instrumental Software Related to Constellation Cooperative Control	Ivan Samylovskiy* (Russia)

Session VS-16: Energy Control and Power Systems

Session chair(s): Chaoyang Chen & Diego Greff

Paper ID	Title	Authors
592	Short-Term Forecasting of Non-Conforming Net Load Using a Fusion Model with Machine Learning and Deep Learning Methods	Mohammad Shahidehpour*, Matin Farhoumandi, Anahita Bahrami, Chiranjeevi Madvesh, Trevor Ludlow, Ankit Mishra, Keerthi Kakumanu, Hani Alarian, Khaled Abdul-Rahman, Jay Jones (USA)
590	A Contribution to the Diagnosis of Submarine Power Cables by Model-Based Approach	Mabrouki Hichem, Slah Farhani*, Emmanuel Schaeffer, Hadj Abdallah Hsan (Tunisia)
190	DC Grid Droop Control for Charging Electric Boats	Fedor Boendermaker, Diëgo Zuidervliet, Peter van Duijsen* (Netherlands)

632	Sliding Mode Control of a Photovoltaic System Connected to the Electrical Grid	Sabrina Soltani, Haythem GRISSA, Slah Farhani, Faouzi Bacha* (Tunisia)
637	Study and Control of the 3 ϕ -DAB DC-DC Converter with a Boost Structure	Abdelkarim Aouiti, soyed Abdessami Soyed, Faouzi Bacha* (Tunisia)
600	MPPT using PSO technique comparing to Fuzzy Logic and P&O Algorithms for Photovoltaic System	Mahboub Brahmi*, Chiheb Ben Regaya, Hichem Hamdi, Abderrahmen ZAAFOURI (Tunisia)

Session VS-17: System Identification

Session chair(s): Alain Vande Wouwer

Paper ID	Title	Authors
636	Research on Multi-Agent State Estimation Algorithm under Intermittent Observation	Haobo Li, Chen Chao-Yang*, Pei Li, Zuguo Chen (China)
524	Change-Point and Model Estimation with Heteroskedastic Noise and Unknown Model Structure	Anas Al-Hashimi*, Thomas Nolte, Alessandro Vittorio Papadopoulos (Sweden)
462	Optimal Parameter Estimation Algorithms from Quantized Outputs	Juan Carlos Gomez*, Gonzalo Daniel Sad (Argentina)
228	Exponentially Stable MRAC of MIMO Switched Systems with Matched Uncertainty and Unknown Control Matrix	Anton Glushchenko*, Konstantin Lastochkin (Russia)
414	Spectral Characteristics Analysis of Electromyography Signals Recorded During Dynamic Contractions	Pâmela de Souza Schiaber*, Paulo Scalassara, Wagner Endo, Cristiano Marcos Agulhari, Leandro Altinari, Sylvio Barbon Junior (Brazil)
659	Comparative study of MPPT algorithms: P&O, INC, and PSO for PV system optimization	Houssine EL HAMMEDI*, Jawher Chroua, Abderrahmen ZAAFOURI (Tunisia)
516	Fractional Modeling of the Speed of a DC Motor and Control with FOPID Controller	Bilel KANZARI*, Adel Taieb (Tunisia)

Session S-44: Modeling and Simulation with Applications

Session chair(s): James Pickering & Claudio Carnevale

Paper ID	Title	Authors
122 (v)	Recent Challenges and Initiatives for Cloud Computing Adoption in Healthcare	Fedaa Altawara*, ALA KHALIFEH (Jordan)
53	Small Signal Modeling of Fractional-Order Boost Converter with Non-Singular Fractional Derivative	Donghui Yu*, Xiaozhong Liao, Yong Wang, Manjie Ran, Da Lin (China)
609	Governing Equations of Three-Axis Flight Motion Simulator	Puneet Panwar*, Shiju Varghese, S.R. Shimjith, Clement C Verghese, Ramakrishna P, P. K. Limaye (India)
128	Container Based Distributed Simulation for Temperature Control in Textile Dyeing Processes	Mustafa Com*, Hasan Burak Ketmen, Betül Sena Çağlar, Mustafa Sencer Sultanoglu, Baris Bulut (Turkey)
222 (v)	Improving Positioning Performance of Positive Position Feedback Scheme with Delay Compensation	Paul Ager*, Ibrahim Beklan Kucukdemiral, Geraint Bevan (United Kingdom)
85	A Receding Horizon Approach for Climate Change Control	Claudio Carnevale*, Lucia Sangiorgi (Italy)
361	Friction Modelling with Slip for Planetary Exploration Rovers	Stuart Shilliday*, Sarah Swinton, Salim A Al Oufi, Euan McGookin, Douglas Thomson, Kevin James Worrall (United Kingdom)

Session S-45: Applied Intelligent Approaches

Session chair(s): Mashael Algoulity & Ala Khalifeh

Paper ID	Title	Authors
129	On Parameter Selection for First-Order Methods: A Matrix Analysis Approach	Eder Baron Prada, Salman Alsubaihi, Khaled Alshehri, Fahad Albalawi* (Saudi Arabia)
548	Optimal financial Benchmark Tracking in a Market with Unbounded Random Coefficients	Mashael Algoulity*, Bujar Gashi (United Kingdom)

410	Semantic Approach for Auto-Driven Medical Database Construction	Zina Nakhla*, Kaouther Nouira (Tunisia)
286	Fully Distributed Continuous-Time Algorithm for Nonconvex Optimization Over Unbalanced Digraphs	Jin Zhang, Yahui Hao, Lu Liu, Xinghu Wang, Haibo Ji* (China)
219	Sales' Forecasting Based on Big Data and Machine Learning Analysis	Fatma Abubaker, ALA KHALIFEH* (Jordan)
58	Estimating the Probability of Falling Share Price Below the Minimum Level	Sergei Semakov* (Russia)
426	Artificial Bee Colony Algorithm for Lean Software Reuse	Mojeeb Alkhiaty*, Anas Alroubaiey (Saudi Arabia)

Session S-46: Nonlinear Systems

Session chair(s): Moussa Boukhnifer

Paper ID	Title	Authors
366	A Decentralized Based Approach Using Hybrid Filtered Beam Search Algorithm for Monitoring Patrols	Sara Hsaini*, Rabah Ammour, Leonardo Brenner, Moulay El Hassan Charaf, Isabel Demongodin (France)
299	Flight Path Optimization and Control of Morphing Cross-Domain Unmanned Vehicle for Entering Water	Chun Qin, Junhui Liu*, Jiayuan Shan, Jianan Wang (China)
66	Automatic Control of Launch Vehicles' Flight Path Slope Angle by Means of the Backstepping Control Method	Romulus Lungu, Florentin-Alin Butu, Mihai-Aureliu Lungu*, Mou Chen (Romania)
435	Investigation on Synchronization of Two Identical Class of Chaotic Systems Using Back-Stepping Control Technique in the Presence of Time Delays	RIDDHI MOHAN BORA*, Bharat Bhushan Sharma, Bhabani Shankar Dey, Indra Narayan Kar (India)
534	Offset-Free Motor Position Control of an Elastic Drive System through Reference Position Correction	Charlotte Tkany*, Martin Grotjahn, Torben Jonsky (Germany)
295	Model Reference Adaptive Control of a Ball Valve for Hybrid Rocket Throttling Application	Zuo-Ren Chen*, Rongshun Chen, Jong-Shinn Wu (Taiwan, R.O.C)
646	Automatic Speech Recognition for Unmanned Aerial Vehicles	GAMAL Bohouta* (Libya)

Session S-47: Supply Chain Management

Session chair(s): Matthieu Godichaud & Farouk Yalaoui

Paper ID	Title	Authors
527	Securing an Agri – Food Marketplace: An Implementation of a Robust Security Layer with API Gateway Integration	Nikolaos Papageorgopoulos, Danai Vergeti, Elena Politi, Dimitrios Ntalaperas, Xanthi Papageorgiou* (Greece)
59	Blockchain Service Layer for ERP Data Interoperability among Multiple Supply Chain Stakeholders	Vangelis Malamas*, Thomas Dasaklis, Theodore Voutsinas, Panayiotis Kotzanikolaou (Greece)
455	Impact of Energy Consumption in a Production Inventory Model with Price and Carbon Emission-Sensitive Demand	Hong Nguyen Nguyen*, Matthieu Godichaud, Lionel Amodeo (France)
284	A Rubber Tyred Gantry Crane Scheduling in Container Terminals in Port of Sfax-Tunisia	SABER BEN ZINA* (Tunisia)
123	A Mathematical Model for Energy Management in a Clothing Supply Chain	Eric Papain MEZATIO*, Mohammadmohsen Aghelinejad, Lionel Amodeo, Isabelle Ferreira (France)
358	Petri Nets Application for Supply Chain Management: A Review of Recent Literature	Daffa Reza Kaiyandra*, N/A Farizal, Naly Rakoto-Ravalontsalama (France)
645	Assembly line balancing with collaborative robots under uncertainty of human processing times	Ilhem Slama, Taha Arbaoui*, Masood Fathi, Amir Nourmohammadi (France)

Session S-48: System Identification

Session chair(s): Dan Stefanoiu & Camilo Garcia Tenorio		
Paper ID	Title	Authors
460	An Identification Algorithm for FIR Systems from Binary Output Measurements	Ali Mestrah*, Mathieu Pouliquen, Eric Pigeon, Hicham Oualla (France)
618 (v)	Model-based Voltage Prediction for a Zinc-Air Cell subject to Piecewise Constant Discharge Currents	Juan Diego Pineda Rodriguez*, Sorin Olaru, Cristina Vlad, Pedro Rodriguez-Ayerbe, Woranunt Lao-atiman, Soorathep Kheawhom (France)
359	Data-Driven Modeling of PFR Kiln	Camilo Garcia-Tenorio*, Alain Vande Wouwer (Belgium)
305	Development of LPV Models for Nonlinear Systems Based on Simplified Additive Nonlinear Autoregressive Exogenous Models	Fabian Kreutmayr*, Christoph Ament (Germany)
468	Nonlinear Identification for Control by Using HARMAX Models	Janetta Culita*, Dan Stefanoiu, Andreea-Maria Nica (Romania)
611	Hammerstein-Wiener Model Identification of De-Oiling Hydrocyclone Separation Efficiency	Stefan Jespersen, Mahsa Kashani, Zhenyu Yang* (Denmark)

Session S-49: Control Applications (Part 2)

Session chair(s): Enrique Barbieri & Daniela Iacoviello		
Paper ID	Title	Authors
343	Modeling and Control of an Aerial Flight Platform Using for Fixed-Wing UAV Landing	Liming Wang, Jian Di, Zhenlong Zhang, Fei Liao, Haibo Ji* (China)
496	Comparison of Adaptive Control Laws on a Satellite Attitude Control Benchmark	Yoni Lahana*, Mauro Mancini, Dimitri Peaucelle, Elisa Capello, Helene EVAIN (France)
486	Fuzzy Logic Controller for the Chemotherapy of Brain Tumor	Muhammad Zubair*, Daniela Iacoviello, Iqra Shafeeq Mughal (Italy)
577	Identification and Control of a Linear Time-Periodic Test Bench Using Harmonic Transfer Functions and LQR Controllers	Basak SERT*, BAHADIR CATALBAS, Ismail Uyanik (Turkey)
376	Output Feedback Reinforcement Learning for Temperature Control in a Fused Deposition Modelling Additive Manufacturing System	Eleni Zavrakli*, Andrew Parnell, Subhrakanti Dey (Ireland)
371	An SIR Recovery-Rate Control Model for Piecewise Constant Transmission Rates	Enrique Barbieri*, Vassilios Tzouanas (USA)
641	Dahlin Deadbeat Internal Model Controller Design for Discrete Systems with Time Delay	Imen Saidi*, Nahla Touati (Tunisia)

Session S-50: Computer Science with applications

Session chair(s): Nhan-Quy NGUYEN & Maria Zemzami		
Paper ID	Title	Authors
347	Using Innovation Diffusion Theory to Understand the Factors Impacting the Adoption of Competency-Based Applications	Rezgui Kalthoum*, Hédia Mhiri Sellami Hédia Mhiri Sellami (Tunisia)
621	Optimal Investment in a Market with Borrowing and a Combined Interest Rate Model	Nuha Alasmi*, Bujar Gashi (United Kingdom)
329	Best fit decreasing algorithm for virtual machine placement modeled as a bin packing problem	Takwa Tlili*, Krichen Saoussen (Tunisia)
114	Energy-Efficient Scheduling Problem under Speed-Scaling and Power-Saving Machine States	Mohammadmohsen Aghelinejad*, Yassine Ouazene, Alice Yalaoui (France)
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