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Welcome Message

On behalf of the organizing committee, we would like to extend a warm welcome to all the participants of the third International Conference on Control, Automation and Diagnosis (ICCAD'19) being held at the Polytech Grenoble, in Grenoble - France on July 2-4, 2019.

The first edition of ICCAD conferences series was held in Hammamet - Tunisia in January 2017 and the second one in Marrakesh - Morocco in March 2018.

We consider ourselves fortunate to have the opportunity to organize ICCAD'19 in Grenoble - France, one of the most beautiful mountainous cities in Europe.

In addition to the regular papers, ICCAD'19 includes exciting plenary keynotes and special sessions. We have received around 270 papers writing by 485 authors from 52 countries worldwide that yielded 125 valid papers. The acceptance rate for this conference was less than 50%. Authors from all continents honored us by reporting their original work, in all areas of Control, Robotics, Optimization, Diagnosis, Engineering, Computer Science and Information Technologies. We thank them for submitting their work to our conference.

We would like to thank all the members on the organizing committee for their extraordinary efforts to ensure that this conference will be a successful one.

We would like to express our gratitude to our sponsors, ATTeDD, Polytech Grenoble, as well as to our technical sponsors IEEE France Section, CNRS, Grenoble Alpes University, Sousse University and our partners G-Scop Laboratory and LARATSI-ENIM.

On behalf of the organizing committee of ICCAD'19

Prof. Zineb SIMEU-ABAZI, Grenoble Alpes University - France

Prof. Imre J. RUDAS, Obuda University - Hungary

Prof. Hassani MESSAOUD, Monastir University - Tunisia

Prof. José Ragot, Lorraine University - France

Dr. Chakib BEN NJIMA, Sousse University - Tunisia

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Sousse University - Tunisia

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Abdelkrim Haqiq
FST, Hassan 1st University - Morocco

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Sousse University - Tunisia

Zineb Simeu-Abazi
Grenoble Alpes University - France

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Essaid Sabir, Morocco		
Francois Peres, France		
Ghanshyam Tejani, India		

Venue

ICCAD'19 will be held at **Polytech Grenoble** in Grenoble - France.

Website: <https://www.polytech-grenoble.fr/>



Grenoble

Capital of the French Alps, Grenoble owes its development and success to its unique geographical location at the junction of three valleys leading, respectively, to Switzerland, Italy and the Rhone valley. The city is surrounded by three mountain ranges - Belledonne, the Chartreuse and the Vercors - with summits reaching between 2000 and 3000m, which is why the author Stendhal famously said of the city that there is a mountain at the end of every street.

The city experienced a period of economic expansion in the nineteenth and twentieth century, symbolized by the holding of the Olympic Winter Games in 1968. Grenoble is now a significant scientific center in Europe.

Grenoble is one of the leading European cities in terms of high-tech industries, especially bio and nano-technologies. World renowned enterprises have settled in Grenoble and in the surrounding area.

Activities

Grenoble is a city of sports. Winter sports of course, ever since the 1968 Winter Olympics, but also sports for sunny days-cycling, mountain biking, hiking, team sports, gymnastics and aerobics, just to name a few.

Mountain

Just a few minutes from the heart of the city, the mountains are clearly up to our standards winter and summer alike for snow sports and hiking adventures. The Isere department and its numerous lakes and bodies of water are welcoming us for rowing, windsurfing, water skiing, or simply for a refreshing dip.

Whatever your projects or your desires, the exceptional natural setting of the city lets you choose the activities that most interest you. Family hike, nature walk starting in the city, an excursion across the Vercors or Chartreuse mountains on donkey back, snow shoe treks or dog sledding, even high mountain races for the most athletic : all of the mountain is accessible from Grenoble.

Breathtaking landscapes, plants, animals... nothing is missing from the magical settings of the natural parks. The diversity of the landscapes is exceptional, marked by the hills and the plains along with lower and upper mountains.

The Isère department is an exceptional snow destination with a dozen resorts on the outskirts of Grenoble. At the crossroads of three valleys, Grenoble is less than thirty minutes from the superb ski resorts of the Dauphiné Alps.

How to reach the Polytech from Grenoble

- 1-Take the tram line B, direction Gière-Plaine sports,
- 2-Get off at the station "Les Taillées-Universités",
- 3-Take the tram line D, direction St Martin d'Hère-Etienne Grappe,
- 4-Get off at the station "Maison communale"

Conference Registration

Tuesday - July 2, 2019

(8.00 – 15.00)

Wednesday - July 3, 2019

(8.00 – 15.00)

Thursday - July 4, 2019

(8.00 – 11.00)

ICCAD'19 Program

Tuesday - July 2, 2019	Registration (8.00 – 10.00)		
	Opening Ceremony (10.00 – 10.20)		
	Keynote 1 (10.20 – 11.00) Prof. Stephane Canu INSA Rouen-France		
	Coffee break (11.00 – 11.30)		
	Technical Sessions 1 (11.30 – 13.00)		
	S1	S2	S3
	Lunch break (13.00 – 14.00)		
	Technical Sessions 2 (14.00 – 15.30)		
	S4	S5	S6
	Keynote 2 (15.30 – 16.10) Prof. Benoît IUNG University of Lorraine-France		
Wednesday - July 3, 2019	Registration (8.00 – 9.30)		
	Technical Sessions 3 (9.30 – 11.00)		
	S7	S8	S9
	Coffee break (11.00 – 11.30)		
	Keynote 3 (11.30 – 12.10) Prof. Belkacem OULD BOUAMAMA Polytech Lille-France		
	Keynote 4 (12.20 – 13.00) Prof. Dr. Imre J. Rudas Óbuda University-Hungary		
	Lunch break (13.00 – 14.00)		
	Technical Sessions 4 (14.00 – 15.30)		
	S10	S11	S12
	20.00 – 22.30 Gala Dinner		
Thursday - July 4, 2019	Technical Sessions 5 (9.00 – 10.30)		
	S13	S14	S15
	Coffee break (10.30 – 11.00)		
	Technical Sessions 6 (11.00 – 12.30)		
	S16	S17	S18
Closing Ceremony			

Presentation - Duration

- Keynote: The duration of each presentation is of 30 minutes plus 10 minutes for questions;
- Oral presentation: The max duration of each presentation is of 15 minutes plus 5 minutes for questions;

Note: Accepted file format for all presentation are PDF and PPT

Sessions Scheduling

	Code	Title	Papers	Room
Technical Sessions 1	S1	Artificial Intelligence and computer applications	174, 162, 99, 13, 47, 103	<i>Thalès</i>
	S2	Robotics	41, 82, 158, 171, 205	<i>Pythagore</i>
	S3	Special Session: New Challenges on Speech Separation and Emotion Sensing	240, 241, 242, 243, 244	<i>Archimède</i>
Technical Sessions 2	S4	Special Session: Artificial Intelligence for Navigation and Control of Mobile Robots	57, 109, 102, 215, 131, 182	<i>Thalès</i>
	S5	Transportation, Logistics and Manufacturing (Part 1)	67, 183, 214, 235, 62, 132, 223	<i>Pythagore</i>
	S6	Power Systems (Part 1)	223, 234, 28, 227, 218, 3, 230	<i>Archimède</i>
Technical Sessions 3	S7	Control Applications	61, 63, 78, 101, 128, 129	<i>Thalès</i>
	S8	Adaptive, Robust and predictive Control	133, 134, 219, 193, 172, 144	<i>Pythagore</i>
	S9	Optimization and Simulation	14, 20, 21, 123, 60, 208, 29, 9	<i>Archimède</i>
Technical Sessions 4	S10	Transportation, Logistics and Manufacturing (Part 2)	232, 189, 159, 160, 24, 233	<i>Thalès</i>
	S11	Diagnosis and Fault Detection (Part 1)	104, 228, 59, 84, 151, 179, 207	<i>Pythagore</i>
	S12	Image Processing	187, 173, 231, 27, 58, 226	<i>Archimède</i>
Technical Sessions 5	S13	Diagnosis and Fault Detection (Part 2)	126, 142, 186, 188, 192, 201	<i>Thalès</i>
	S14	Neural network and Fuzzy logic	48, 143, 108, 217, 140, 213	<i>Pythagore</i>
	S15	Control Theory	112, 65, 85, 87, 152, 212	<i>Archimède</i>
Technical Sessions 6	S16	Power Systems (Part 2)	175, 6, 229, 127, 145, 7	<i>Thalès</i>
	S17	Energy Control	221, 220, 125, 184, 55, 124	<i>Archimède</i>
	S18	Nonlinear Systems and Control	83, 111, 141, 46, 66, 224	<i>Pythagore</i>

Opening Ceremony	<i>Pythagore</i>
Keynote 1, Keynote 2, Keynote3, Keynote 4	<i>Pythagore</i>
Closing Ceremony	<i>Pythagore</i>

Keynote 1

Title: "Deep learning for reliability, Diagnosis and predictive maintenance"

Speaker: **Prof. Stephane Canu, INSA Rouen-France**

Chair: **Prof. Hassani Messaoud**

Keynote 2

Title: "What are the evolutions of diagnostics and maintenance approaches for the Cyber Physical (Production) Systems in the context of Industry of the Future?"

Speaker: **Prof. Benoît IUNG, University of Lorraine-France**

Chair: **Prof. Zineb Simeu-Abazi**

Keynote 3

Title: "Hybrid Bond Graphs for Supervision of Renewable Energy Systems: Application to Power to X Technologies."

Speaker: **Prof. Belkacem OULD BOUAMAMA, Polytech Lille-France**

Chair: **Prof. Hassene Seddik**

Keynote 4

Title: "Advances of Cyber-Physical Control in Medical and Industrial Applications"

Speaker: **Prof. Dr. Imre J. Rudas, Óbuda University-Hungary**

Chair: **Dr. Maria Di Mascolo**

Papers, Sessions and Sessions Chairs

Session Code: S1 / Session Title: Artificial Intelligence and computer applications
Paper Session Chair(s) : Dr. Maria Di Mascolo

- 174** Breast Cancer recognition using Kernel Extreme Learning Machine (KELM) Based on local binary pattern features
BACHA Sawcen , TAOUALI Okba and LIOUANE Noureeddine
- 162** Review of Machine Learning Approaches In Fault Diagnosis applied to IoT Systems
Ndeye Gueye Lo, Jean-Marie Flaus and Olivier Adrot
- 99** Training Function Stability in Anomaly Intrusion Detection based Deep Learning
Khadija BENNACEUR , Zakaria Sahraoui , Abdenour Labeled and Mohamed Ahmed-Nacer
- 13** Two-Axis Mechanical Stabilizer for Omnidirectional Antenna Mounted on a 1.8 Meter Buoy for Polarization Loss Factor Reduction

Ian Mosquera, Mar Francis De Guzman and Calvin Artemies Hilario

- 47 Improvement of DV-Hop Localization Algorithm in Multi-hop Wireless Sensor Networks
Sana Messous, Nouredine Liouane and Alain Pegatoquet
- 103 The neural multi-model approach for nonlinear systems identification
Amira Slimani, Ayachi Errachdi and Mohamed Benrejeb

Session Code: S2 / Session Title: Robotics

Paper **Session Chair(s) : Prof. Hassani Messaoud**

- 82 Experimental Real-Time Setup for Vision Driven Hand-Over with a Collaborative Robot
Leonardo Sabatino Scimmi, Matteo Melchiorre, Stefano Mauro and Stefano Pastorelli
- 158 Implementation of start-up tests for system health assessment: Application to a telepresence robot « RobAIR »
ZINEB SIMEU-ABAZI, ERIC GASCARD and MOHAMED AMINE HAJ KACEM
- 171 Detection & isolation of sensor and actuator additive faults in a 4-mecanum wheeled mobile robot (4-MWMMR)
Samia MELLAH, Guillaume GRATON, El Mostafa EL ADEL, Mustapha OULADSINE and Alain PLANCHAIS
- 205 Human machine interface based on virtual reality for programming industrial robots
Vladimir Filaretov, Dmitry Yukhimets, Eduard Mursalimov, Anton Gubankov, Alexander Zuev and Sergey Anisimov
- 41 On robustness of PD control with gravity compensation of torque-driven robot manipulators
Rafael Kelly and Carmen Monroy

Session Code: S3 / Session Title: New Challenges on Speech Separation and Emotion Sensing

Paper **Session Chair(s) : Prof. Emmanuel Simeu**

- 240 Automatic Lip segmentation with level set method
M. MILED, M.A. BEN MESSAOUD, and A. BOUZID
- 241 Audio-Visual Fusion for Aggression Detection Using Deep Neural Networks
Noussaiba Jaafar and Zied Lachiri
- 242 DNN-Based Laughter Synthesis
Nadia Mansouri and Zied Lachiri
- 243 Monaural speech separation based on linear regression optimized using gradient descent
Belhedi Wiem, Ben Messaoud Mohamed anouar and Bouzid Aicha
- 244 Comparative study of face detection methods in spontaneous videos
Amal Adouani, Wiem Mimoun Ben Henia and Zied Lachiri

Session Code: S4 / Session Title: Artificial Intelligence for Navigation and Control of Mobile Robots
Paper **Session Chair(s) : Prof. Dr. Imre J. Rudas**

- 57 3D Simulator for Navigation of a Mobile Robot Using Simscape-SIMULINK
Khaled Khnissi, Chiraz Ben Jabeur and Hassene Seddik
- 109 Implementation of SNNPID optimized Neural Networks Controller for a two-wheeled mobile robot
Chiraz Ben Jabeur and Hassene Seddik
- 182 Balancing Control of Bipedal Robot Using Deep Reinforcement Learning
Ki Beom Kim and Jong Hyeon Park
- 215 Mobile Robot Obstacle Avoidance in labyrinth Environment Using Fuzzy Logic Approach
Habiba Batti, Chiraz Ben Jabeur and Hassen Seddik
- 102 Fuzzy Logic Controller for Autonomous Mobile Robot Navigation
Habiba Batti, Chiraz Ben Jabeur and Hassene Seddik
- 131 Open-loop Tracking Control of an Android Guided Two Degrees of Freedom (DoF) Articulated Writing Robotic Arm
Shahriar Rahman Fahim, Sanjay Dey, Md. Rashiduzzaman, Subroto K. Sarkar and Sajal K. Das

Session Code: S5 / Session Title: Transportation, Logistics and Manufacturing (Part 1)
Paper **Session Chair(s) : Prof. Zied Lachiri**

- 67 Study of Road Traffic Noise in Monastir-Tunisia
Jalel Chebil, Mohamed A. Fekih, Chakib B. Njima and Mohamed Hadi Habaebi
- 183 Numerical simulation of second-order macroscopic traffic model Aw-Rascle-Zhang
Leila Heni, Asma Khelifi, Habib Haj-Salem and Khalifa Slimi
- 214 Root causes analysis and fault prediction in intelligent transportation systems: coupling unsupervised and supervised learning techniques
John Mbuli, Maroua Nouri, Damien Trentesaux and Damien Baert
- 235 LQ Optimal Multi-Loop Control of Goods Distribution Systems with Multi-Modal Transportation Solutions
Przemysław Ignaciuk
- 62 Defining urban logistics profile zones in South American metropolis by combining functional and spatial clustering techniques
Andrés Regal-Ludowieg, Michelle Rodriguez-Serra and Jesus Gonzalez-Feliu
- 132 Cashflow forecasting with linear models
Kishore Chalakkal Varghese and Anna Maria Perdon
- 233 Production of the future to support circular economy - development of a dedicated platform by means of a multidisciplinary approach
Fabien Dubois, Akash Basia, Asiye Kurt, Mickaël Bettinelli, Pu Zheng, Vincent Jourdain and Kevin Guelle

Session Code: S6 / Session Title: Power systems (Part 1)

Paper

Session Chair(s) : Dr. Hassen Fourati

- 223 New online three phases stator resistances estimation for stator Induction Machine fault diagnosis
Idriss Benlaloui, Abderrahmane Khemis, Dalila Khamari, Said Drid, Larbi Chrifi-Alaoui and Mohammed Ouriagli
- 234 A method to system parameters using the average inductor current of a modular power converter
Luiz Fernando Lavado Villa , Romain Perriniaux , Clement Foucher and Germain Garcia
- 28 Switching Mechanism and Analysis of Memristor Model Parameters
Sami Ghedira, Faten Rziga Ouaja, Khaoula Mbarek and Kamel Besbes
- 227 A Self Tuning Fuzzy-Fractional-Order P-I Controller for Speed Control of DC Motor
Arezki Fekik ,Hakim Denoun , Ahmad Taher Azar , Khaled Mohamad Almustafa , Dhafer Almakhles , Mustapha Zaouia , Mohamed Lamine Hamida and Nacira Yassa
- 218 MRAS type-2 fuzzy logic observer and controller for robust speed sensorless induction motor
Idriss Benlaloui, Dalila Khamari, Abderrahmane Khemis, Said Drid, Larbi Chrifi-Alaoui and Mohammed Ouriagli
- 3 Wind MPPT for a PMSG SWT in a GridConnected DC Microgrid
Daniel Zammit, Cyril Spiteri Staines, Alexander Micallef and Maurice Apap
- 230 A Hybrid Bayesian Network Based Method to Assess and Predict Electrical Power Network Reliability
Abdelaziz Lakehal, Zoubir Chelli and Yacine Djeghader

Session Code: S7 / Session Title: Control applications

Paper

Session Chair(s) : Prof. Hassene Seddik

- 61 A Fault Tolerant Control Approach for the Solar-Powered HALE UAV
WANG Peng, JIA Gaowei, CHEN Qingyang, WANG Yujie and WANG Jianfeng
- 63 Adaptive super-twisting sliding mode controller for 2-DOF Helicopter
Rihab Bkekri, Anouar Benamor and Hassani Messaoud
- 78 Benchmark for analysis, modeling and control of ventilation systems in small-scale mines
Oscar-O. Rodriguez-Diaz, David-F. Novella-Rodriguez
- 101 Model Predictive Control of a Variable Speed Wind Turbine Using A Two-mass Model
Boubekeur Boukhezzar
- 128 Towards a simple but energy-efficient HVAC control synthesis for data centers
Michel Fliess, Cedric Join, Maria Bekcheva, Alireza Moradi and Hugues Mounier
- 129 Grey Forecasting Model and Particle Swarm based Control of a Phosphorite Sinter Process
Nigina Toktassynova, Hassen Fourati and Batyrbek Suleimenov

Session Code: S8/ Session Title: Adaptive, Robust and predictive Control**Paper** **Session Chair(s) : Prof. Said Drid**

- 133 Robust adaptive control for uncertain systems with unknown time varying state delay
Benamor Anouar, Ben Njima Chakib and Messaoud Hassani
- 134 Robust control of hydraulic system with delay input
Benamor Anouar, Ben Njima Chakib and Messaoud Hassani
- 219 Discrete second order sliding mode control for robust tracking and model following of linear uncertain systems
Wafa Boukadida , Anouar Benamor and Hassani Messaoud
- 193 Predictive control of the heating system in smart building
Sondes GHARSELLAOUI and Hassani MESSAOUD
- 172 Optimal Fuzzy Adaptive Backstepping Controller for Attitude Control of a Quadrotor Helicopter
Hossam-Eddine GLIDA , Latifa ABDOU and Abdelghani CHELIHI
- 144 LMI-based H2 Control of Nonlinear Coupled Tank System
Jaffar Seyyed Esmaeili and Abdullah Başçi

Session Code: S9 / Session Title: Optimization and Simulation**Paper** **Session Chair(s) : Prof. Zineb Simeu-Abazi**

- 14 Optimization of Distributed CFAR Detection using Grey Wolf Algorithm
Houcine Oudira ,Amel Gouri and Amar Mezache
- 20 A Verilog-A based RRAM Switching Model for Simulation and Analysis
Faten OUAJA RZIGA ,Khaoula MBAREK,Sami GHEDIRA and Kamel BESBES
- 21 Implementation of 1T1R-based OxRRAM Memristor Model for Circuit Design and Simulation
Khaoula MBAREK, Faten OUAJA RZIGA ,Sami GHEDIRA and Kamel BESBES
- 123 EE-SE trade-off's Optimization for NOMA Systems
Naziha GLEI and Rhaimi Belgacem CHIBANI
- 60 Terminal Guidance Simulation and Flight Test for Small UCAV
Hongbo Xin, Qingyang Chen, Yujie Wang, Gaowei Jia and Zhongxi Hou
- 208 Dynamic optimization of a continuous Lactide ring-opening polymerization process
Nawel Afsi, Sami Othman , Toufik Bakir, Liborio I. Costa , Anis Sakly and Nida Sheibat-Othman
- 29 Optimal Multi-Type DG Integration and Distribution System Reconfiguration for Active Power Loss Minimization using CPSO Algorithm
Sirine Essallah and Adel Khedher
- 9 Analysis of orthotropic materials using numerical finite element method models, Application to a hip prosthesis biomechanical body
Brahim Necib and Ali Benhaoua

Session Code: S10 / Session Title: Transportation, Logistics and Manufacturing (Part 2)
Paper **Session Chair(s) : Prof. Hassani Messaoud**

- 232 An Extended Circular Supply Chain Model Including Repurposing Activities
Asiye Kurt, Van-Dat Cung, Fabien Mangione , Mario Cortes-Cornax and Agnès Front
- 189 Multidimensional Matrix Approach to Material Requirements Planning
Kishore Chalakkal Varghese and Annamaria Perdon
- 159 Model based rules generation for Intrusion Detection System for industrial systems
Mohamad Houssein Monzer , Kamal Beydoun and d Jean-Marie FLAUS
- 160 Conceptual specifications of a cooperative intermachines dialogue
Fathia Azzouzi , Adam Bouras and Nizar Jebli
- 24 Using Multi-layer Coding Genetic Algorithm to Solve Time-Critical Task Assignment of Heterogeneous UAV Teaming
Gaowei Jia, Jianfeng Wang, Peng Wang, Qingyang Chen and Yujie Wang

Session Code: S11 / Session Title: Diagnosis and Fault Detection (Part 1)
Paper **Session Chair(s) : Prof. Zied Lachiri**

- 104 Application of Predictive Maintenance for Detection of Gearing Faults in Rotating Machines
Abdelkader Slimane, Slimane Sid Ahmed, Said Kebdani, Chaib Mohammed, Sidahmed Dahmane, Bouchouicha Benattou and Nouredine Sardi
- 228 Overcoming the Barriers in Diagnostics and Prognostics of the Circular Industrial System by Hidden Markov Model
Akash Basia, Eric Gascard, Zineb Simeu-Abazi and Peggy Zwolinski
- 59 An Improved Bayesian Integrated ICA Approach for Control Loop Diagnosis with Small Sample Size
Wenbing Zhu , Zijiang Yang , Xuesong Xiao , Yuanhaowei Ji , Shuchao Li ,Xue Yan and Guoli Ji
- 84 An Automatic Fault Detection and Localization Strategy for Switched Reluctance Machine Open-Circuit Fault in EVs Applications
Yakoub SAADI, Rabia SEHAB, Ahmed CHAIBET, Mousaa BOUKHNIFER and Demba DIALLO
- 151 Kernel PCA-based GLRT for nonlinear fault detection and isolation of chemical process
Radhia Fezai ,Majdi Mansouri , Kamaleldin Abodayeh, Hazem Nounou and Mohamed Nounou
- 179 Data-Based Design of Robust Fault Isolation Residuals Using LASSO Optimization
Silvia Cascianelli, Francesco Crocetti, Gabriele Costante, Paolo Valigi and Mario Luca Fravolini
- 207 Rapid Detection of Incipient Faults Using Radial Basis Function Networks
Walid Abid , Abdelkader Krifa and Nouredine Liouane

Session Code: S12 / Session Title: Image processing

Paper

Session Chair(s) : Prof. Said Amari

- 173 Robust heart activity measurement using webcam
Djamaleddine DJELDJLI , Choubeila MAAOUI and Fethi BEREKSI REGUIG
- 187 Studying Multifractality in C.elegans sequences based on multi order FCGR Images
Zeineb chebbi babchia and Afef Elloumi Oueslati
- 231 Self-Healing Image Sensor Using Defective Pixel Correction Loop
Ghislain Takam Tchendjou and Emmanuel Simeu
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