

# INTERNATIONAL CONFERENCE On Control, Decision and Information Technologies

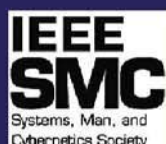
# 2016



University of Malta  
L-Università ta' Malta

## Program

April 6-8, 2016  
San Antonio Hotel + Spa Hotel,  
St. Paul's Bay - Malta



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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 3rd International Conference on Control, Decision and Information Technologies (CoDIT'16) being held at the San Antonio Hotel + Spa Hotel, in St. Paul's Bay – Malta on April 6-8, 2016.

The first edition of this conference was held in Hammamet, Tunisia in May 2013 and the second one in Metz, France in November 2014. We consider ourselves fortunate to have the opportunity to organize CoDIT'16 in Malta and offer you a taste of the Maltese hospitality.

In addition to the regular papers, CoDIT'16 includes exciting plenary keynotes, panel session and special sessions. We have received around 345 papers from 51 countries worldwide that yielded 157 valid papers. The acceptance rate for this conference was around 46%. Authors from all continents honored us by reporting their original work, in all areas of Control, Optimization, Decision, 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 sponsor, the University of Malta, as well as to our technical sponsors, the IEEE Systems, Man, and Cybernetics Society, the IEEE Control Systems Society, the IEEE Malta Section, the Tunisia Chapter, GDR MACS, GDR RO and the International Institute of Innovation, Industrial Engineering and Entrepreneurship.

On behalf of the organizing committee of CoDIT'16

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*Belkacem OULD-BOUAMAMA, University of Lille 1, France*

*Achraf Jabeur TELMOUDI, University of Sousse, Tunisia*

*Enrique H. VIEDMA, University of Granada, Spain*

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# Accommodation and Venue

**CoDIT'16** will be held at **San Antonio Hotel + Spa Hotel**, in St. Paul's Bay - Malta.

Website: <http://www.dbhotelsresorts.com/dbsanantonio/>



The db San Antonio Hotel + Spa, Malta, is located in the northern part of the island of Malta, right in the heart of Qawra, St. Paul's Bay. The hotel overlooks the clear Mediterranean Sea and is situated only 15km from the capital city, Valletta and 16km away from the Malta International Airport.

The hotel location provides easy access to the main roads which makes it easy to reach by car and by public transport. The hotel has its own underground private car park which is available for hotel guests at a charge. The bus terminus is situated just 100 meters away by walk, offers direct transportation to all areas in Malta including Valletta, Paceville, St. Julian's, Sliema, Rabat, Marsaxlokk and the old city of Mdina amongst other destinations. These facilities are ideal to make your stay more comfortable.

db San Antonio Hotel + Spa, Malta GPS Coordinates are N35.952928, E14.418354.

## Prebooked private airport transfer

db San Antonio Hotel + Spa Malta offers private airport transfers from and to the airport at an additional charge. For further information, please visit our section [Airport Transfers](#). For booking and inquiries please contact the Hotel Reception by email on [reception.dbsanantonio@dbhotelsresorts.com](mailto:reception.dbsanantonio@dbhotelsresorts.com) or by phone on tel: (+356) 2350 3011/2

## By Car

In order to reach the hotel, as you exit from the MIA, follow the signs to the locality of Hal Qormi. As you arrive at a roundabout in Qormi, take the road Triq l-Mdina which is situated on the left hand side towards Rabat/Mdina. Keep driving until you arrive to another roundabout leading to Mdina. Follow the signs taking you to Mosta, Burmarrad and St. Paul's Bay. After you pass the village of Burmarrad, you arrive at a roundabout leading you to St. Paul's Bay. Keep on driving towards the Bugibba promenade towards Bugibba square. Drive 2 km more towards Qawra and on the right hand side you will see the San Antonio Hotel & Spa, Malta.

## By Taxi

Upon your arrival at the Malta International Airport, a Taxi stand service is available inside the Welcome Hall in the Arrivals Lounge, situated on the left hand side of the Hall. The service is available 24hrs a day where you can inquire for a taxi on the spot and be assisted instantly. Estimated drive time is 30 to 45 minutes depending on traffic and the cost is approximately €25 per way.

## By Public Transport

The public transport provides transportation to all localities. Upon your arrival from the airport, on the right hand side you will find the bus terminus where you can take the bus no. X3. The bus will drive you all the way to St. Paul's Bay and stops at the Bugibba Bus Terminus which is situated 100m away from the db San Antonio Hotel + Spa, Malta.

# Conference Registration

**Wednesday - April 06, 2016**

(8.00 – 18.30)

**Thursday - April 07, 2016**

(8.00 – 18.30)

**Friday - April 08, 2016**

(8.30 – 11.00)

## Program

Wednesday - April 06, 2016	<b>Registration (8.00 – 8.30)</b>			
	<b>Technical Sessions 1 (8.30 – 10.10)</b>			
	<b>C1</b>	<b>D1</b>	<b>C3</b>	<b>IT1</b>
	<b>Opening Ceremony (10.10 – 10.30)</b>			
	<b>Coffee break (10.30 – 10.45)</b>			
	<b>Keynote 1 (10.45 – 11.25)</b> <i>Event-Triggered Control for Output Consensus of Heterogeneous Linear Multi-Agent System</i> <b>Prof. Gang Feng</b> City University of Hong Kong, Hong Kong, China			
	<b>Keynote 2 (11.30 – 12.10)</b> <i>Risks-Forecast@People-in-Clouds: Big data based Clouds Healthcare and Risk Forecasting based on Subjective Intelligence</i> <b>Prof. Hamido Fujita</b> Director of Intelligent Software Systems Iwate Prefectural University, Japan			
	<b>Lunch break (12.10 – 13.45)</b>			
	<b>Technical Sessions 2 (13.45 – 15.25)</b>			
	<b>C4</b>	<b>D2</b>	<b>C5</b>	<b>IT4</b>
	<b>Coffee break (15.25 – 15.40)</b>			
	<b>Keynote 3 (15.40 – 16.20)</b> <i>Real machine scheduling problems with metaheuristics</i> <b>Prof. Rubén Ruiz</b> Polytechnic University of Valencia, Spain			
	<b>Technical Sessions 3 (16.30 – 18.30)</b>			
	<b>IT2</b>	<b>D3</b>	<b>C6</b>	<b>C9</b>

<b>Thursday - April 07, 2016</b>	<b>Technical Sessions 4 (8.30 – 10.10)</b>			
	<b>C10</b>	<b>IT5</b>	<b>C2</b>	<b>D5</b>
	<b>Coffee break (10.10 – 10.30)</b>			
	<b>Keynote 4 (10.30 – 11.10)</b> <i>Games: AI's Long-Standing Friend and (Final) Frontier</i> <b>Prof. Georgios N. Yannakakis</b> Director of the Institute of Digital Games University of Malta, Malta			
	<b>Keynote 5 (11.15 – 11.55)</b> <i>Facial Animation and Speech Synchronization in MPEG-4</i> <b>Prof. Abdennour El Rhalibi</b> Liverpool John Moores University, UK			
	<b>Lunch break (11.55 – 13.30)</b>			
	<b>Technical Sessions 5 (13.30 – 15.10)</b>			
	<b>C15</b>	<b>IT6</b>	<b>C16</b>	<b>D4</b>
	<b>Coffee break (15.10 – 15.30)</b>			
	<b>Panel Session on</b> <i>"Intelligent Networks and Applications"</i> <b>(15.30 – 16.30)</b>			
	<b>Technical Sessions 6 (16.30 – 18.30)</b>			
	<b>CD1</b>	<b>IT3</b>	<b>C12</b>	<b>C14</b>
	<b>Gala Banquet (20.00 – ...)</b>			
	<b>Friday - April 08, 2016</b>	<b>Technical Sessions 7 (8.15 – 9.55)</b>		
<b>C7</b>		<b>C8</b>		<b>C13</b>
<b>Coffee break (9.55 – 10.15)</b>				
<b>Keynote 6 (10.15 – 10.55)</b> <i>A System of Autonomous Vehicles: Modeling, Diagnostics, Prognostics, Localization, Navigation and Cloud-Based Control</i> <b>Prof. Mo Jamshidi</b> University of Texas, USA				
<b>Keynote 7 (10.55 – 11.35)</b> <i>Agility issues in supply chain management</i> <b>Prof. Chengbin Chu</b> Centrale Supélec, Université Paris-Saclay, France				
<b>Technical Sessions 8 (11.35 – 13.35)</b>				
<b>C11</b>	<b>D6</b>		<b>C17</b>	

# Sessions Scheduling

	Code	Title	Papers	Room
Technical Sessions 1	C1	Nonlinear Systems	227, 133, 31, 217, 139	<b>Agadir</b>
	D1	Management and Optimization of Systems	199, 4, 312, 198, 233	<b>Fes</b>
	C3	Fractional Differentiation and Its applications	24, 300, 197,21, 175	<b>Rabat</b>
	IT1	Computer Applications and Artificial Intelligence	163, 64, 72, 8, 77	<b>Nador</b>
Technical Sessions 2	C4	Adaptive Control	268, 178, 40, 244,205	<b>Agadir</b>
	D2	Heuristics and Approximation Algorithms for Combinatorial Problems	174, 292, 272, 265,313	<b>Fes</b>
	C5	Control Applications (Part 1)	215, 12, 310, 228, 307	<b>Rabat</b>
	IT4	Data analysis	234, 80, 103, 97, 105	<b>Nador</b>
Technical Sessions 3	IT2	Computer Application in engineering	101, 87, 13, 127,20, 226	<b>Agadir</b>
	D3	Combinatorial Optimization	295, 231,277, 246, 119	<b>Fes</b>
	C6	Control Applications (Part 2)	134, 305,62, 262,236	<b>Rabat</b>
	C9	Embedded Systems	285,115, 75, 131, 149	<b>Nador</b>
Technical Sessions 4	C2	Fault-tolerant control	232, 271, 16, 63, 166	<b>Agadir</b>
	C10	Diagnosis and Fault Detection	327, 304, 267, 43, 269	<b>Fes</b>
	IT5	Image Processing (Part 1)	26, 42, 187, 302, 270	<b>Rabat</b>
	D5	New Territories of Information	340, 311, 341, 330,342	<b>Nador</b>
Technical Sessions 5	IT6	Image Processing (Part 2)	210, 122, 176, 37, 60, 141	<b>Agadir</b>
	C15	Robotics (Part 1)	263, 156, 298, 297, 143	<b>Fes</b>
	D4	Supply Chain management	306, 94, 221, 243, 71	<b>Rabat</b>
	C16	Linear Systems	207, 66, 219, 88, 309	<b>Nador</b>
Technical Sessions 6	CD1	Petri nets models for modeling, control and optimization	180, 132, 55, 189,106, 249	<b>Agadir</b>
	IT3	Information technology and Computer Science	191, 274, 252, 283, 56, 114	<b>Fes</b>
	C12	Intelligent Control	328, 186, 82, 331,184	<b>Rabat</b>
	C14	Robotics (Part 2)	48, 229, 150, 193, 251	<b>Nador</b>
Technical Sessions 7	C7	Control Design Methods	303, 196, 98, 36, 299	<b>Nador</b>
	C8	Control Theory	238, 209, 200, 15,346	<b>Fes</b>
	C13	Manufacturing Control and Automation	27, 291, 206,208	<b>Rabat</b>
Technical Sessions 8	C11	Energy Control and Power Systems	118, 79, 160, 83, 256	<b>Nador</b>
	D6	Operational Research	137, 259, 254, 294,282	<b>Fes</b>
	C17	Monitoring and Supervision	32, 253, 3, 308	<b>Rabat</b>

<b>Opening Ceremony</b>	<b>Fes</b>
<b>Keynote 1, Keynote 2, Keynote3, Keynote 4, Keynote 5, Keynote 6 and Keynote 7</b>	<b>Fes</b>
<b>Panel Session</b>	<b>Fes</b>



**Wednesday - April 06, 2016 / Technical Sessions 1 (8.30 – 10.10)**

**Session Code: C1 / Session Title: Nonlinear Systems**

<b>Paper</b>	<b>Session Chair(s) : Karim Khayati</b>
227	Application of Adaptive Sliding Mode Control with Integral/Exponential Adaptation Law to Mechanical Manipulators <i>Jiang Zhu and Karim Khayati</i>
31	A Self-Organizing Fuzzy Neural Network for Identification and Control of Nonlinear Systems <i>Zengqian Kou, Jianhua Zhang and Rubin Wang</i>
133	Nonlinear Optimal Control of Wind Energy Conversion Systems With Incomplete State Information Using SD-DRE <i>Ahmed Khamis, Hoa M. Nguyen and D. Subbaram Naidu</i>
217	Development of LPV Models and Switching LPV- $H_\infty$ Controller for a Hydraulic System <i>Artur Gmerek, Nader Meskin and Fadi Jaber</i>
139	State-Dependent Adaptive Dynamic Programming for a Class of Continuous-Time Nonlinear Systems <i>Yazdan Batmani, Mohammadreza Davoodi and Nader Meskin</i>

**Session Code: D1 / Session Title: Management and Optimization of Systems**

<b>Paper</b>	<b>Session Chair(s) : Alain Quilliot</b>
199	Online assignment strategies for emergent, urgent and work-in-cases surgeries in an operating theatre <i>Afef Bouguerra, Christophe Sauvey and Nathalie Sauer</i>
4	ONTOMSN: Medical Social Network ONTOlogy <i>Wafa Tebourski, Wahiba Ben Abdessalem Karaa and Henda Ben Ghezela</i>
312	Synthesis of a dwelling layout as a packing problem using objects of varying sizes <i>Y. Bouzoubaa, C. Minich, A. Nagih and A. Pruski</i>
198	PDP/Assignment Decomposition of Vehicle Sharing Problems <i>Alain Quilliot and Antoine Sarbinowski</i>
233	Stock Market Forecast using Bio-Inspired Computing <i>Kazi Shah Nawaz Ripon and S. A. Ahsan Rajon</i>

**Session Code: C3 / Session Title: Fractional Differentiation and Its applications**

<b>Paper</b>	<b>Session Chair(s) : Cristina I. Muresan</b>
24	Accuracy and efficiency of adjoint state based parameter identification for fractional advection diffusion equation with space-dependent coefficients <i>Boris Maryshev, Alain Cartalade, Christelle Latrille and Marie-Christine Néel</i>
300	Modeling and Control of the Temperature for Cytostatic Solutions Used in Surgical Procedures <i>Vlad Muresan, Iulia Clitan, Daniel Moga, Rozica Moga, Gloria Cosovici, Nicoleta Stroia, Corneliu Lungoci, Aurel Ioan Mironiuc and Florian Neaga</i>
197	Temperature Control of a Semi Infinite Diffusive Interface Medium Using the CRONE Controller <i>Fady Christophy, Xavier Moreau, Riad Assaf and Roy Abi Zeid Daou</i>
21	Design and Experimental Validation of an Optimal Fractional Order Controller for Vibration Suppression <i>Cristina I. Muresan, Silviu Folea, Eva H. Dulf and Ovidiu Prodan</i>
175	Modeling and Analysis of Delay-Locked Loop Tracking with Quadrature-spread CDMA Signals over Fading Channels <i>Hamood-ur-Rahman Khan and Mohamed Adnan Landolsi</i>

**Session Code: IT1 / Session Title: Computer Applications and Artificial Intelligence**

<b>Paper</b>	<b>Session Chair(s) : Enrique H. VIEDMA</b>
163	Implementation of a clothoid based trajectory into the ROS framework <i>Matthias Otto and Michael Kramer</i>
64	Improving the Performance of Processing Recursive Structures of XML Path Queries and Data <i>Norah Saleh Alghamdi</i>
72	Decision support system integrating fuzzy logic and expert system for optimization of smart grid functioning <i>Otilia Dragomir and Florin Dragomir</i>
8	Critical Infrastructure Automated Immuno-Response System (CIAIRS) <i>Sahar Badri, Paul Fergus and William Hurst</i>
77	Distributed Self-Organized Cluster-based Fusion Tree Generation Algorithm <i>Kyuoke Yeun, Tae Joon Jun and Daeyoung Kim</i>

**Wednesday - April 06, 2016 / Technical Sessions 2 (13.45 – 15.25)****Session Code: C4 / Session Title: Adaptive Control**

<b>Paper</b>	<b>Session Chair(s) : Chakib Ben Njima</b>
268	Diagnosis of a dynamic hybrid system by hybrid timed automata <i>Olfa Azzabi, Chakib Ben Njima and Hassani Messaoud</i>
178	Communication and Maintaining of data integrity method for decentralized network of autonomous group of mobile robots <i>Konstantin Amelin, Kirill Tyushev and Vasiliy Kaliteevskii</i>
40	Robust Adaptive Sliding Mode Control of Time Varying Delay Power System <i>Rihab Bkekri, Wafa boukadida, Anouar Benamor and Hassani Messaoud</i>
244	Choice of Step-Size for Consensus Protocol in Changing Conditions via Stochastic Approximation Type Algorithm <i>Konstantin Amelin, Natalia Amelina, Yury Ivanskiy and Yuming Jiang</i>
205	Control Strategy Design for Clutch Self-calibration for AMT on Single Axle Hybrid City Bus <i>Yuhui Hu, Wenchen Shen, Tianxiao Yu and Huiyan Chen</i>

**Session Code: D2 / Session Title: Special Session: Heuristics and Approximation Algorithms for Combinatorial Problems**

<b>Paper</b>	<b>Session Chair(s) : Imed Kacem</b>
174	A diversified method for the multi-scenarios max-min knapsack problem <i>Thekra Al Douri and Mhand Hifi</i>
272	Neighborhood Search-based Heuristic for the K-Clustering Minimum Biclique Completion Problem <i>Najat Al-Iedani, Mhand Hifi, Toufik Saadi</i>
265	A Tropical Optimization Approach in the Analysis of Pairwise Comparison Matrices <i>Nikolai Krivulin</i>
313	Optimal on-line algorithms for bi-directional non-preemptive conversion with interrelated conversion rates <i>Pascal Schroeder, Günter Schmidt and Imed Kacem</i>
292	Valid Inequalities for Unrelated Parallel Machines Scheduling with Precedence Constraints <i>Mohammed-Albarra Hassan, Imed Kacem, Sébastien Martin and Izzeldin M. Osman</i>

**Session Code: C5 / Session Title: Control Applications (Part 1)****Paper****Session Chair(s) : Maria Pia Fanti**

- 215 A Software Tool for the Decentralized Control of AGV Systems  
*Maria Pia Fanti, Agostino Marcello Mangini, Giovanni Pedroncelli and Walter Ukovich*
- 12 Robotics and Servo Press Control Applications: Experimental Implementations  
*L. Canan Dulger, M. Taylan Das, Recep Halicioglu, Sadettin Kapucu and Mehmet Topalbekiroglu*
- 307 An LMI Tuning Technique for Robust Constrained Cross-Direction Controllers  
*Mohammed E. Ammar*
- 228 The Bounded Control Gravitational Stabilization Problem for Satellites with Movable Mass  
*Sergey P. Bezglasnyi*
- 310 Tuning Model Predictive Controllers for Cross-Direction Processes  
*Mohammed E. Ammar*

**Session Code: IT4 / Session Title: Data analysis****Paper****Session Chair(s) : Anna V. Kitaeva**

- 234 Robust Estimating of a Quadratic Trend's Parameter  
*Anna V. Kitaeva and Alexandra O. Zhukovskaya*
- 80 Reliability analysis regarding product fleets in use phase: Multivariate cluster analytics and risk prognosis based on operating data  
*S. Bracke, A. Lückner, and S. Sochacki*
- 103 Workflow approach to design automatic tutor in elearning environment  
*Salma Boumiza, Dalila Souilem and Alexander Bekiarski*
- 97 PEM fuel cell prognostics under variable load: a data-driven ensemble with new incremental learning  
*Kamran Javed, Rafael Gouriveau, Nouredine Zerhouni and Daniel Hissel*
- 105 RJMCMC Learning for Clustering and Feature Selection of  $L_2$ -Normalized Vectors  
*Ola Amayri and Nizar Bouguila*

**Wednesday - April 06, 2016 / Technical Sessions 3 (16.30 – 18.30)****Session Code: IT2 / Session Title: Computer Application in engineering****Paper****Session Chair(s) : Abdennour El Rhalibi**

- 101 Improving a Bag of Words Approach for Skin Cancer Detection in Dermoscopic Images  
*Naser Alfed, Fouad Khelifi and Ahmed Bouridane*
- 87 Detection and Classification of Retinal Fundus Images Exudates using Region based Multiscale LBP Texture Approach  
*Mohamed Omar, Fouad Khelifi and Muhammad Atif Tahir*
- 13 A new Hybrid Bio-Inspired Approach to Resolve the Multiple Sequence Alignment Problem  
*El-amine Zemali and Abdelmadjid Boukra*
- 127 Detection of dependencies between literature domains through relation extraction and copulas  
*Dragana Miljkovic, Nada Lavrac, Marko Bohanec, and Biljana Mileva Boshkoska*
- 20 3D Object Retrieval System using Skewness Database  
*Vicky Sintunata and Terumasa Aoki*
- 226 Erosion Technique to Ultrasonic Data Reduction In Material Inspection  
*Thouraya Merazi-Meksen, Malika Boudraa and Bachir Boudraa*

**Session Code: D3 / Session Title: Combinatorial Optimization****Paper** **Session Chair(s) : Günter Schmidt**

- 295 The Multi-terminal vertex separator problem: Extended formulations and Branch-and-Cut-and-Price  
*Youcef Magnouche, A. Ridha Mahjoub and Sébastien Martin*
- 231 On lower bounds computation for the Discrete Cost Multicommodity Network Design Problem  
*Nesrine Bakkar Ennaifer, Safa Bhar Layeb, Farah Mansour Zeghal*
- 277 Task Allocation for Wireless sensor Network Using Logic Gate-based Evolutionary Algorithm  
*Ayet Allah Ferjani, Nouredine Liouane and Imed Kacem*
- 246 Polyhedral Analysis for the Disjunctively Constrained Knapsack Problem  
*Mariam Ben Salem, Raouia Taktak and Hanène Ben Abdallah*
- 119 A DSS based on a genetic algorithm for solving the hydrogen transportation problem  
*Hiba Yahyaoui, Abdelkader Dekdouk and Saoussen Krichen*

**Session Code: C6 / Session Title: Control Applications (Part 2)****Paper** **Session Chair(s) : Belkacem Ould Bouamama**

- 134 Comparative study of the speed DTC Induction machine based on fuzzy logic technique  
*F. Hamidia, A. Larabi, M.S. Boucherit*
- 305 Soft computing programmable control systems-onchip: Trends and surface polynomial modeling  
*Khouloud Filali, Khaled Nouri and Younes Lahbib*
- 62 Bond-graph to Hyper-graph Transformation Rules in System of Systems Modelling  
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- 299 Interval Extended PCA-based Fault Diagnosis of Spacecraft Thrusters  
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- 254 Minimizing tardiness for job shop scheduling under uncertainties  
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*Esther Mohr and Eva König*
- 282 Estimation of Distribution Algorithm for dynamic assignment problem of parking slots  
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- 253 Use of an eye-tracker to assess workers in ceramic tile surface defect detection  
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- 3 Nonlinear Process monitoring using Online Kernel Principal Component Analysis KPCA  
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- 308 An Air-guided and Fly-cutting System for Biconic-Zernike Surfaces  
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# Keynotes

## Keynote 1

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### EVENT-TRIGGERED CONTROL FOR OUTPUT CONSENSUS OF HETEROGENEOUS LINEAR MULTI-AGENT SYSTEMS

**Prof. Gang Feng**

Chair Professor

City University of Hong Kong, Hong Kong, China

In this talk distributed even-triggered control algorithms will be presented for output consensus of heterogeneous multi-agent systems with general linear dynamics, with the objective to reduce the number of controller updates and communication exchanges. It is shown that the output consensus problem can be solved by the proposed event-triggered control algorithms if a necessary and sufficient condition is satisfied. Then a self-triggered control scheme is also developed, where continuous monitoring of measurement errors can be avoided. The feasibility of both proposed control schemes is discussed by excluding Zeno behavior. It is also shown that agents are able to achieve output consensus with significant reduction of the number of triggering events, controller updates and communication transmission. As a result, energy can be saved and the lifespan of the agents can be prolonged. A numerical example is given to illustrate the effectiveness of the proposed control schemes.

#### Bio-Sketch

**Gang Feng** received the B.Eng and M.Eng. Degrees in Automatic Control from Nanjing Aeronautical Institute, China in 1982 and in 1984 respectively, and the Ph.D. degree in Electrical Engineering from the University of Melbourne, Australia in 1992. Professor Feng was a Lecturer in Royal Melbourne Institute of Technology, 1991 and a Senior Lecturer/Lecturer, University of New South Wales, 1992-1999. He has been with City University of Hong Kong since 2000 where he is now a Chair Professor of Mechatronic Engineering. He was also a Changjiang Chair Professor at Nanjing University of Science and Technology, awarded by Ministry of Education. He has received Alexander von Humboldt Fellowship, the IEEE Transactions on Fuzzy Systems Outstanding Paper Award, the Best Paper Award of IEEE International Conference on Neural Networks and Signal Processing and the Best Theoretical Paper Award in the Second World Congress on Intelligent Control and Automation. He is an author of one research monograph entitled "Analysis and Synthesis of Fuzzy Control Systems: A Model Based Approach", and over 200 SCI indexed papers including over 100 in IEEE Transactions. His research interests include intelligent systems and control, networked control systems, and multi-agent systems and control. Professor Feng is a fellow of IEEE. He has been an Associate Editor of *IEEE Trans. Automatic Control*, *IEEE Trans. on Fuzzy Systems*, *Mechatronics*, *IEEE Trans. Systems, Man, & Cybernetics*, *Journal of Systems Science and Complexity*, and *Journal of Control Theory and Applications*.

## Keynote 2

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### RISKS-FORCAST@PEOPLE-IN-CLOUDS: BIG DATA BASED CLOUDS HEALTHCARE AND RISK FORECASTING BASED ON SUBJECTIVE INTELLIGENCE

**Prof. Hamido Fujita**

**Director of Intelligent Software Systems**

**Iwate Prefectural University, Japan**

**and**

**Editor-in-Chief: <http://yannakakis.net/>, Elsevier**

In decision making most approaches are taking into account objective criteria, however the subjective correlation among decision makers provided as preference utility is necessary to be presented to provide confidence preference additive among decision makers reducing ambiguity and produce better utility preferences measurement for subjective criteria among decision makers. Most models in Decision support systems are assuming criteria as independent. Therefore, these models are ranking alternatives based on objective data analysis. Also, different type of data (time series, linguistic values, interval data, etc.) imposes some difficulties to do decision making using classical multi criteria decision making models.

Sophisticated machine learning methods to estimate or extract emotions from the content created by users has been developed including support vector machines, Bayesian networks, maximum entropy approaches and concept level analysis of natural language text, supported by combinations of common-sense reasoning. These approaches are mainly based on language text processing with sufficient documents, which is usually in-large is not available.

We think subjectiveness is related to the contextual form of criteria. Uncertainty of some criteria in decision making is also considered as other important aspect These draw backs in decision making are major research challenges that are attracting wide attention, like on big data analysis for risk prediction, medical diagnosis and other applications that are in practice more subjective to user situation and its knowledge related context. Subjectivity would be examined based on correlations between different contextual structures that is reflecting the framework of personal context, for example in nearest neighbor based correlation analysis fashion. Some of the attributes incompleteness also may lead to affect the approximation accuracy. Attributes with preference-ordered domain relations properties become one aspect in ordering properties in rough approximations.

The Virtual Doctor System (VDS) developed by my group is a system assisting human doctor who is practicing medical diagnosis in real situation and environment. The interoperability is represented by utilizing the medical diagnosis cases of medical doctor, represented in machine executable fashion based on human patient interaction with virtual avatar resembling a real doctor. VDS is practiced as a virtual avatar interacting with the human patient based on physical views and mental view analysis. In this talk I outline our VDS system and then discuss related issues in subjective decision making in medical domain. Using fuzzy reasoning techniques in VDS, it has been shown that it is possible to provide better precision in circumstances that is related to partial known data and uncertainty on the acquisition of medical symptoms.

### Bio-Sketch

**Hamido Fujita** is professor at Iwate Prefectural University (IPU), Iwate, Japan, as a director of Intelligent Software Systems. He is the Editor-in-Chief of Knowledge-Based Systems, Elsevier of impact factor (2.97) for 2014. He received Doctor Honoris Causa from O'buda University in 2013, and a title of Honorary Professor from O'buda University, Budapest, Hungary in 2011. He received Honorary scholar from University of Technology Sydney, Australia on 2012. He is Adjunct professor to Stockholm University, Sweden, University of Technology Sydney, National Taiwan Ocean University and others. He has supervised PhD students jointly with University of Laval, Quebec, Canada; University of Technology, Sydney, Australia; Oregon State University (Corvallis), University of Paris 1 Pantheon-Sorbonne, France and University of Genoa, Italy. He has four international Patents in Software System and Several research projects with Japanese industry and partners. He is vice president of International Society of Applied Intelligence. He has given many keynotes in many prestigious international conferences on intelligent system and subjective intelligence. He headed a number of projects including Intelligent HCI, a project related to Mental Cloning as an intelligent user interface between human user and computers and SCOPE project on Virtual Doctor Systems for medical applications.

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### Keynote 3

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#### REAL MACHINE SCHEDULING PROBLEMS WITH METAHEURISTICS

**Prof. Rubén Ruiz**

**Polytechnic University of Valencia, Spain**

Real scheduling problems found in industry are as varied and heterogeneous as the nature of the different products manufactured. One can expect that if the manufacturing process of an LCD panel and a ceramic tile have little in common, scheduling algorithms for solving those problems need to be also radically different. However, designing ad-hoc scheduling methods for each manufacturing problem is extremely time consuming. Such scheduling algorithms, even if successful, are hardly a viable choice as continuous changes in products, machines, tooling, processes, methodologies, etc. might render them quickly obsolete. On the contrary, simple metaheuristics without too much problem-specific knowledge and working on a solution representation abstraction are basically problem agnostic. Effective metaheuristics still produce state-of-the-art results most of the time and can result in good solutions for instances of realistic size in a matter of minutes. In this presentation, we will introduce simple metaheuristics based on the Iterated Greedy (IG) principles. These methods are inherently simple with very few parameters. They are easy to code and results are easy to reproduce. We will show that for all tested problems so far they show state-of-the-art performance despite their simplicity. Special emphasis will be put on realistic scheduling problems coming from several industrial applications. We will move from flowshops to real hybrid flexible flowline problems with several side constraints. We will defend the choice of simpler, yet good performing approaches over complicated metaphor-based algorithms in a solid attempt to close the long-standing research gap between the theory and the practice of scheduling.

### Bio-Sketch

**Rubén Ruiz** is Full Professor of Statistics and Operations Research at the Polytechnic University of Valencia, Spain. He is co-author of more than 60 papers in International Journals and has participated in presentations of more than a hundred papers in national and international conferences. He is

editor of the Elsevier's journal Operations Research Perspectives (ORP) and co-editor of the JCR-listed journal European Journal of Industrial Engineering (EJIE). He is also associate editor of other important journals like TOP or Applied Mathematics and Computation as well as member of the editorial boards of several journals most notably European Journal of Operational Research and Computers and Operations Research. He is the director of the Applied Optimization Systems Group (SOA, <http://soa.iti.es>) at the Instituto Tecnológico de Informática (ITI, <http://www.iti.es>) where he his or has been principal investigator of several public research projects as well as privately funded projects with industrial companies. His research interests include scheduling and routing in real life scenarios.

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## Keynote 4

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### **GAMES: AI'S LONG-STANDING FRIEND AND (FINAL) FRONTIER.**

**Prof. Georgios N. Yannakakis**

**Director of the Institute of Digital Games**

**University of Malta, Malta**

Why games offer the ideal arena for AI? Alternatively, how can AI help us make better games? Is it possible, for instance, that AI understands how we feel, think and react and, in turn, automatically design new games for us? Can those computationally designed games be considered creative? What happens when we design together with our AI? Do we merely co-design or can a machine truly foster our creativity as human designers?

In this talk I will address the above questions by positioning computer games as the ideal application domain for AI for the unique features they offer. For that purpose, I will identify a number of key creative facets in modern game development and discuss their required orchestration for a successful game product. I will also focus on the study of player emotion and will detail the key phases for efficient game-based affect interaction. Advanced methods for player experience modeling, game adaptation, procedural content generation, and computational game creativity will be showcased via a plethora of game projects developed at the Institute of Digital Games, University of Malta.

#### **Bio-Sketch**

**Georgios N. Yannakakis** (<http://yannakakis.net/>) is the Director of the Institute of Digital Games, University of Malta (UoM). He received the PhD degree in Informatics from the University of Edinburgh in 2005. Prior to joining the Institute of Digital Games, UoM, in 2012 he was an Associate Professor at the Center for Computer Games Research at the IT University of Copenhagen. He does research at the crossroads of artificial intelligence, computational creativity, affective computing, advanced game technology, and human-computer interaction. He pursues research concepts such as user experience modeling and procedural content generation for the design of personalized interactive systems for entertainment, education, training and health. He has published over 180 journal and conference papers in the aforementioned fields and his work has been cited broadly. His research has been supported by numerous national and European grants and has appeared in Science Magazine and New Scientist among other venues. He is an Associate Editor of the IEEE Transactions on Affective Computing and the IEEE Transactions on Computational Intelligence and AI

in Games. He has been the General Chair of key conferences in the area of game artificial intelligence (IEEE CIG 2010) and games research (FDG 2013). He is a Senior Member of IEEE.

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## Keynote 5

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### FACIAL ANIMATION AND SPEECH SYNCHRONIZATION IN MPEG-4

**Prof. Abdennour El Rhalibi**

**Professor of Entertainment Computing**

**Head of Strategic Projects**

**Head of Computer Games Research Group at the Protect Centre**

**School of Computer Science**

**Liverpool John Moores University, UK**

In this talk, Prof. Abdennour El Rhalibi will present an overview of his research in game technologies at LJMU. He will present some recent projects developed with BBC R&D, on game middleware development and in facial animation. In particular he will introduce a novel framework for coarticulation and speech synchronization for MPEG-4 based facial animation. The system, known as Charisma, enables the creation, editing and playback of high resolution 3D models; MPEG-4 animation streams; and is compatible with well-known related systems such as Greta and Xface. It supports text-to-speech for dynamic speech synchronization. The framework also enables real-time model simplification using quadric-based surfaces. The coarticulation approach provides realistic and high performance lip-sync animation, based on Cohen-Massaro's model of coarticulation adapted to MPEG-4 facial animation (FA) specification. He will also discuss some experiments which show that the coarticulation technique gives overall good results when compared to related state-of-the-art techniques.

#### **Bio-Sketch**

**Abdennour El Rhalibi** is Professor of Entertainment Computing and Head of Strategic Projects at Liverpool John Moores University. He is Head of Computer Games Research Lab at the Protect Research Centre. He has over 22 years' experience doing research and teaching in Computer Sciences. Abdennour has worked as lead researcher in three EU projects in France and in UK. His current research involves Game Technologies and Applied Artificial intelligence. Abdennour has been leading for six years several projects in Entertainment Computing funded by the BBC and UK based games companies, involving cross-platform development tools for games, 3D Web-Based Game Middleware Development, State Synchronisation in Multiplayer Online Games, Peer-to-Peer MMOG and 3D Character Animation. Abdennour has published over 160 publications in these areas. Abdennour serves in many journal editorial boards including ACM Computer in Entertainment and the International Journal of Computer Games Technologies. He has served as chair and IPC member in over 100 conferences on Computer Entertainment, AI and VR. Abdennour is member of many International Research Committees in AI and Entertainment Computing, including IEEE MMTC IG: 3D Rendering, Processing and Communications (3DRPCIG), IEEE Task Force on Computational Intelligence in Video Games and IFIP WG 14.4 Games and Entertainment Computing.

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## Keynote 6

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### A SYSTEM OF AUTONOMOUS VEHICLES: MODELING, DIAGNOSTICS, PROGNOSTICS, LOCALIZATION, NAVIGATION AND CLOUD-BASED CONTROL

**Prof. Mo Jamshidi, Ph.D., DEgr.**

**Lutcher Brown Endowed Professor**

**The University of Texas, USA**

With the advent of the Internet in mid-1990's people of the world got connected. System of systems (or cyber-physical systems) have been advocated within US military and US aerospace industry for over 10 years. System of Systems (SoS) are integration of independent operatable and non-homogeneous legacy systems to achieve a higher goal than the sum of the parts. SoS is a generalization of Internet where people, machines or machines and machines are now connected. For the past half century or so, large amount of data has been accumulating in all aspects of our lives. Advances in sensor technology, the Internet, wireless communication, and inexpensive memory have all contributed to an explosion of "Big Data".

The objective of this presentation is to describe the fundamental problems addressed for a system of autonomous vehicles (airborne, land and undersea). Issues like modeling, diagnostic, prognostics, big data analytic, control, testing, evaluation and outreach all will be discussed. A UTSA open stack cloud infrastructure is also being used to do most compute-intensive tasks.

#### **Bio-Sketch**

**Mo M. Jamshidi** (Fellow IEEE, Fellow ASME, A. Fellow-AIAA, Fellow AAAS, Fellow TWAS, Fellow NYAS) received BS in EE, Oregon State University, Corvallis, OR, USA in 1967, the MS and Ph.D. degrees in EE from the University of Illinois at Urbana-Champaign, IL, USA in June 1969 and February 1971, respectively. He holds honorary doctorate degrees from University of Waterloo, Canada, 2004 and Technical University of Crete, Greece, 2004. Currently, he is the Lutcher Brown Endowed Chaired Professor at the University of Texas, San Antonio, TX, USA. He has been an advisor to NASA (including 1st MARS Mission), USAF, USDOE and EC/EU (Brussels). He has over 730 technical publications including 68 books (11 text books), research volumes, and edited volumes in English and a few foreign languages. He is the Founding Editor or co-founding editor or Editor-in-Chief of 5 journals including *IEEE Control Systems Magazine* and the *IEEE Systems Journal*. He is an Honorary Professor at three Chinese Universities (Nanjing and Xi'an), Deakin University (Australia), Birmingham University and Loughbrough University (UK), and Obuda University (Hungary). In October 2005 he was awarded the IEEE's Norbert Weiner Research Achievement Award. He is a member of the University of the Texas System Chancellor's Council since 2011. He is currently involved in research on system of systems engineering with emphasis on cloud computing, robotics, UAVs, biological and sustainable energy systems. He has over 6600 citations on Scholar Google.

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## Keynote 7

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### AGILITY ISSUES IN SUPPLY CHAIN MANAGEMENT

**Prof. Chengbin Chu**

**Director/Chair Professor of Supply Chain Management**

**CentraleSupélec, Université Paris-Saclay, France**

In this talk, we discuss increasingly important agility issues in supply chain management. Especially we present major concerns of practitioners and the gap between their expectations and academic research, identify some interesting topics for academic research. To illustrate, we address a real-life problem in flexible quantity contracting between a supplier and a manufacturer.

#### Bio-Sketch

**Chengbin Chu** received the B.Sc. degree in Electrical Engineering from Hefei University of Technology, Hefei, China, in 1985 and the Ph.D. degree in Computer Science from Metz University, Metz, France, in 1990. He was with the National Research Institute in Computer Science and Automation (INRIA), France, as a Research Officer (chargé de recherche) from 1987 to 1996. He was a Professor with the University of Technology of Troyes, France, from 1996 to 2008, where he was also the Founding Director of the Industrial Systems Optimization Laboratory. He currently holds a Chair Position in Supply Chain Management at CentraleSupélec, Université Paris-Saclay, France, sponsored by Carrefour, LVMH, SAFRAN and SANOFI. He is interested in research areas related to operations research and modeling, analysis, and optimization of supply chain and production systems. He is author or co-author of three books and more than 140 articles in international journals such as Operations Research, SIAM Journal of Computing, European Journal of Operational Research, IEEE Transactions on Robotics and Automation, IEEE Transactions on Automation Science and Engineering, IEEE Transactions on Systems, Man and Cybernetics, Parts A and C, International Journal of Production Research, Naval Research Logistics, and so on. He also published many papers in conference proceedings. For his research and application activities, he received the First Prize of Robert Faure Award in 1996. He also received the “1998 Best Transactions Paper Award” from the IEEE Robotics and Automation Society. Three of his articles have been awarded in international conferences. Dr. Chu was named “Chang Jiang Scholars Programme” Chair Professor by the Chinese Ministry of Education in 2005. He was an Overseas Visiting Professor and Overseas Director of the Department of Industrial Engineering at Xi’an Jiaotong University from 2006 to 2010. He is currently a Visiting Chair Professor at Tongji University, Shanghai, China. He served as an Associate Editor of the IEEE Transactions on Robotics and Automation from 2001 to 2004. He is currently an Associate Editor of the IEEE Transactions on Automation Science and Engineering and the IEEE Transactions on Industrial Informatics and a member of the Editorial Board of Computers & Industrial Engineering.