

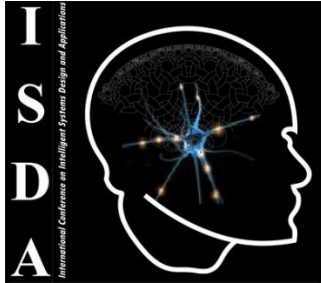
# **16<sup>th</sup> International Conference on Intelligent Systems Design and Applications (ISDA 2016)**

**DECEMBER 14-16, 2016**

**PORTO, PORTUGAL**

## **CONFERENCE PROGRAM PRATICAL INFORMATION**





## 16<sup>th</sup> International Conference on Intelligent Systems Design and Applications (ISDA 2016)

Sponsored by:



**POLITÉCNICO  
DO PORTO**

**isep** Instituto Superior de  
**Engenharia** do Porto



## **Welcome Message**

Welcome to the 16th International Conference on Intelligent Systems Design and Applications (ISDA16), which is held in Porto, Portugal during December 14-16, 2016. ISDA 2016 is jointly organized by the Institute of Engineering, Polytechnic of Porto, Portugal and Machine Intelligence Research Labs (MIR Labs), USA and Technically Supported by the IEEE Systems, Man and Cybernetics Society Technical Committee on Soft Computing.

ISDA 2016 brings together researchers, engineers, developers and practitioners from academia and industry working in all interdisciplinary areas of intelligent systems and system engineering to share their experiences, and to exchange and cross-fertilize their ideas. The aim of ISDA 2016 is to serve as a forum for the dissemination of state-of-the-art research and development of intelligent systems, intelligent technologies, and applications.

The themes of the contributions and scientific sessions range from theories to applications, reflecting a wide spectrum of the coverage of intelligent systems and computational intelligence areas. ISDA 2016 received submissions from over 32 countries and each paper was reviewed by at least 5 reviewers in a standard peer-review process. Based on the recommendation by five independent referees, finally about 105 papers were accepted for publication in the proceedings published by Springer, Verlag.

Many people have collaborated and worked hard to produce a successful ISDA 2016 conference. First and foremost, we

would like to thank all the authors for submitting their papers to the conference, for their presentations and discussions during the conference. Our thanks to Program Committee members and reviewers, who carried out the most difficult work by carefully evaluating the submitted papers. Our special thanks to J. A. Tenreiro Machado, Institute of Engineering, Polytechnic of Porto and Francisco Almada Lobo, Critical Manufacturing, Portugal for the exciting plenary talks.

We express our sincere thanks to special session chairs, organizing committee chairs for helping us to formulate a rich technical program. Welcome to Porto, Portugal and hope that you will enjoy the conference program.

### **General Chairs**

Ana Maria Madureira, Institute of Engineering, Polytechnic of Porto, Portugal

Ajith Abraham, Machine Intelligence Research Labs (MIR Labs), USA

### **Program Chairs**

Dorabela Gamboa, Polytechnic Institute of Porto, Porto, Portugal

Paulo Novais, University of Minho, Braga, Portugal

## Intelligent Systems Design and Applications (ISDA 2016)

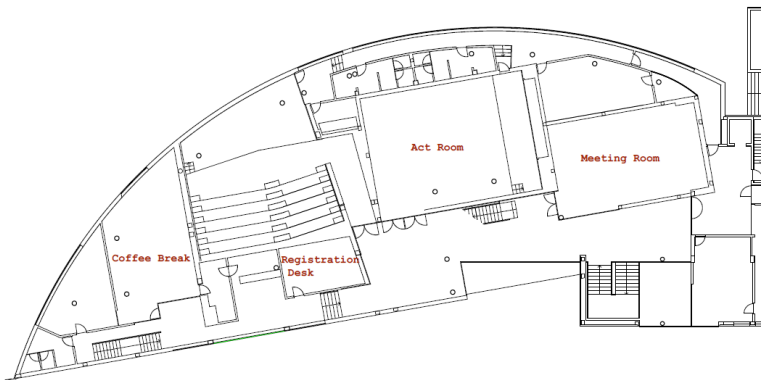
	14 December Wednesday	15 December Thursday
<b>8:00</b>	Registration Desk	
<b>8:30</b>		Registration Desk
<b>9:00</b>	Opening Ceremony	
<b>9:30</b>	Plenary Talk 1	Plenary Talk 2
<b>10:00</b>		
<b>10:30</b>	Coffee Break	Coffee Break
<b>11:00</b>	Parallel Session (Act Room & Meeting Room)	Parallel Session (Act Room & Meeting Room)
<b>13:00</b>	Lunch Break	Lunch Break
<b>14:00</b>	Parallel Session (Act Room & Meeting Room)	Parallel Session (Act Room & Meeting Room)
<b>16:30</b>	Coffee Break	Coffee Break
<b>16:30</b>	Parallel Session (Act Room & Meeting Room)	Parallel Session (Act Room & Meeting Room)
<b>18:30</b>	Adjournment of ISDA'16	End of conference
<b>19:00</b>	Conference Banquet (Departure from ISEP)	

# Intelligent Systems Design and Applications (ISDA 2016)



MAP

## E Building 2<sup>nd</sup> floor



## Intelligent Systems Design and Applications (ISDA 2016)

### CONFERENCES INFORMATION

#### Secretariat

Email: amd@isep.ipp.pt  
Secretariat welcome desk:  
14 and 15<sup>th</sup> of December, from 8:00 to 18:30

#### Meals and Coffee-Breaks

Lunches will be served to registered conference participants on the days 14<sup>th</sup> and 15<sup>th</sup> of December, from 13:00 to 14:00. The lunch works in a self-service system, and 4 types of dishes are available shown below. Coffee-breaks will also be served as estimated on program.

	<b>14 December Lunch</b>	<b>15 December Lunch</b>
<b>Fish</b>	Fish “ <i>Bulhão Pato</i> ” with clams and rice	Grated plaice with pineapple with rice or boiled potatoes
<b>Meat</b>	Duck Rice	Baked chicken with peas rice
<b>Diet</b>	Fresh cod baked with potatoes and vegetables	Grilled plaice with rice
<b>Vegetarian</b>	Vegetarian soybean stew	Rice dumpling with tofu, corn and carrot

#### Conference Rooms

Act Room (Building E) and Meeting Room (Building E)

#### Messages and Internet

Wireless Internet access is available. To access, please use the following information:

SSID: ISEPWLAN

Password: 5bB8j87RFe23

#### Conference Dinner

The dinner will be served at “A Margem” restaurant (Address: Rua da Praia nº 17, Afurada, Vila Nova de Gaia).

Transport will be provided by 19:00 to restaurant and return to ISEP.

# Intelligent Systems Design and Applications (ISDA 2016)

## CONFERENCE PROGRAM

**Wednesday 14<sup>th</sup>, July 2016**

**08:00-09:00 Registration**

**09:00-09:30 - Welcome Message & Opening Ceremony (Act Room)**

**09:30-10:30 - Plenary Talk 1 - Fractional Calculus: Fundamentals and Applications**

*By J. A. Tenreiro Machado - (Act Room)*

**10:30-11:00 - Coffee Break**

**11:00 -13:00 - Parallel Session 1 (Act Room)**

### **CLASSIFICATION & CLUSTERING**

*Chair: Ana Madureira and Shafiq Alam*

Using Cluster Barycenters for the Generalized Traveling Salesman Problem  
*Mehdi El Krari, Belaid Ahiod and Bouazza El Benani*

A Gamification Model for Resource Sharing in Malaysian Schools using Cloud Computing Platform  
*M Nordin A Rahman*

Improving Imputation Accuracy in Ordinal Data Using Classification  
*Shafiq Alam*

Three Case Studies Using Agglomerative Clustering  
*Rodrigo Camargos and M. C. Nicoletti*

Robust and Reliable Bionic Optimization of Nonlinear Control Problems  
*Rolf Steinbuch and Lukas Haas*

Multi-objective Particle Swarm Optimisation for Robust Dynamic Scheduling in a Permutation Flow Shop  
*Mohanad Al-Behadili, Djamila Ouelhadj and Dylan Jones*



**11:00 -13:00 -Parallel Session 1: (Meeting Room)**

**DATA MINING**

*Chair: Leonilde Varela Wilson Soto*

A Parallel Adaptive PSO Algorithm with non-Iterative Electrostatic Repulsion and Social Dynamic Neighbourhood

*Wilson Soto and Daniel Soto*

A Minimal Rare Substructures-Based Model for Graph Database Indexing

*Mehdi Azaouzi and Lotfi Ben Romdhane*

Industrial Plant Layout Analysing based on SNA

*Leonilde Varela, Adriana Araújo, Goran Putnik, V. Manupati and K. Anirudh*

Mining perfectly rare itemsets on Big Data: an approach based on Apriori-Inverse and MapReduce

*Francisco Padillo, J. M. Luna and Sebastián Ventura*

A Proposal to Model Knowledge Dimension in Sensitive Business Processes

*Mariam Ben Hassen, Mohamed Turki and Faïez Gargouri*

BigDimETL: ETL for multidimensional Big Data

*Hana Mallek, Faiza Ghazzi, Olivier Teste and Faiez Gargouri*

**13:00-14:00 - Lunch Break**

**14:00-16:30 - Parallel Session 2: (Act Room)**

**IMAGE PROCESSING & PATTERN ANALYSIS I**

*Chair: Ajith Abraham and*

An Approach For Incorporating The Usability Optimization Process Into The Model Transformation

*Marwa Hentati, Lasaad Benammar, Abdelwaheb Trabelsi and Adel Mahfoudhi*

Learner's Profile Hierarchization In An Interoperable Education System

*Leïla Ghorbel, Corinne Amel Zayani, Ikram Amous and Florence Sèdesby Sebastián Basterrech, Enrique Alba and Vaclav Snasel*

Nuclei Malignancy Analysis Based On An Adaptive Bottom-Hat Filter

*Tiia Ikonen, Keijo Haataja, Pekka Toivanen, Teemu Tolonen and Jorma Isola*

Age And Gender Classification From Finger Vein Patterns

*Wafa Damak, Randa Boukhris Trabelsi, Alima Damak Masmoudi, Dorra Sellami and Amine Nait-Ali*

Multibiometrics Enhancement Using Quality Measurement In Score Level Fusion

*Saliha Artabaz, Layth Sliman, Hachemi Nabil Dellys, Karima Benatchba and Mouloud Koudil*

Using a Synthetic Character Database for Training Deep Learning Models Applied to Offline Handwritten Recognition

*Jorge Sueiras, Victoria Ruiz, Angel Sanchez and Jose Velez*

Reliable Attribute Selection based on Random forest(RASER)

*Noura Aboudi, Hechmi Shili and Lotfi Ben Romdhane*

#### **14:00-16:30 - Parallel Session 2: (Meeting Room)**

##### **HEURISTIC APPROACHES I**

*Chair: M. Teresa Monteiro and Fernando Lima Neto*

A Contribution of Dynamical Systems Theory and Epidemiological Modeling to a Viral Marketing Campaign

*João N. C. Gonçalves, Helena Sofia Rodrigues and M. Teresa T. Monteiro*

GA-PSO-FASTSLAM: A Hybrid Optimization Approach in Improving FastSLAM Performance

*Alif Ridzuan Khairuddin, Mohamad Shukor Talib, Habibollah Haron and Muhamad Yazid Che Abdullah*

Fish School Search Variations and Other Metaheuristics in the solution of Assembly Line Balancing Problems

*Isabela Maria Carneiro de Albuquerque, João Batista Monteiro Filho, Fernando B. De Lima Neto and Alany M. de Oliveira Silva*

Improved Search Mechanisms for the Fish School Search Algorithm

*João Batista Monteiro Filho, Isabela Maria Carneiro de Albuquerque, Fernando Barque De Lima Neto and Filipe Vieira Silva Ferreira*

Bayesian Networks for Identifying Semantic Relations in a Never-Ending Learning System

*Edimilson Batista Dos Santos, Massilon Lourenço Fernandes, Estevam R. Hruschka Júnior and Maisa Cristina Duarte*

Test Suite Prioritization using Nature Inspired Meta-Heuristic Algorithms

*Daya Gupta and Vishal Gupta*

Diversification Strategies in Differential Evolution Algorithm to Solve the Protein Structure Prediction Problem

*Pedro Henrique Narloch and Rafael Parpinelli*

**16:30:17:00 - Coffee Break**

**17:00-18:20 - Parallel Session 3: (Act Room)**

**HEURISTIC APPROACHES II**

*Chair: Dalila Durães and*

Effects Of Random Sampling On SVM Hyper-Parameter Tuning

*Tomas Horvath, Rafael G. Mantovani and Andre C. P. L. F. de Carvalho*

Cloudlets Architecture for Wireless Sensor Network

*Hela Maddar, Wafa Kammoun and Habib Youssef*

Trust Intrusion Detection System based on Location for Wireless Sensor Network

*Hela Maddar, Wafa Kammoun and Habib Youssef*

Detection of Behavioral Patterns for Increasing Attentiveness Level

*Dalila Durães, Sérgio Gonçalves, Davide Carneiro, Javier Bajo and Paulo Novais*

**17:00-18:20 - Parallel Session 3: (Meeting Room)**

**HEURISTIC APPROACHES II**

*Chair: Ana Madureira and Jose Elias Claudio Arroyo*

Heuristic For Scheduling Intrees On M Machines With Non-Availability Constraints

*Khaoula Ben Abdellafou, Hatem Hadda and Ouajdi Korbaa*

An ILS Heuristic For The Waste Collection Vehicle Routing Problem With Time Windows

*Alba Assis Campos and Jose Elias Claudio Arroyo*

A General VNS Heuristic For A Three-Stage Assembly Flow Shop Scheduling Problem

*Saulo Cunha Campos, Jose Elias Claudio Arroyo and Ricardo Tavares*

Security Incident Response: Towards A Novel Decision-Making System

*Samih Souissi, Ahmed Serhrouchni, Layth Sliman and Benoit Charroux*

**18:20 - Adjournment of ISDA'16**

**19:00-22:00 City Tour and Conference Banquet**

**Thursday 15<sup>th</sup>, December 2016**

**08:30-09:30 - Registration**

**09:30-10:30 - Plenary Talk 2 - Industry 4.0: Facts, myths and where to start**  
*By Francisco Almada Lobo - (Act Room)*

**10:30-11:00 - Coffee Break**

**11:00-13:00 - Parallel Session 4: (Act Room)**

**NEURAL NETWORK AND FUZZY SYSTEMS**

*Chair: Fernando Lima Neto and Bruno Cunha*

Certification under Uncertainties of Control Methods for Multi-source Elevators  
*Chloé Desdouits, Mazen Alamir, Rodolphe Giroudeau and Claude Le Pape*

Self-Organizing Maps and Fuzzy C-means Algorithms on Gait Analysis Based on  
Inertial Sensors Data

*Rafael Caldas, Yabing Hu, Fernando B. De Lima Neto and Bernd Markert*

A Genetic-Fuzzy Classification Approach to improve High-Dimensional Intrusion  
Detection System

*Imen Gaied, Farah Jemili and Ouajdi Korbaa*

M2Onto: an Approach and a Tool to Learn OWL Ontology from MongoDB  
Database

*Hanen Abbes and Faiez Gargouri*

An improved Elman Neural Network for Daily Living Activities Recognition

*Zaineb Liouane, Tayeb Lemlouma, Philippe Roose, Frederic Weis and Hassani  
Messaoud*

A Genetic Neural Network Approach for Unusual Behavior Prediction in Smart  
Home

*Zaineb Liouane, Tayeb Lemlouma, Philippe Roose, Frederic Weis and Hassani  
Messaoud*

**11:00-13:00 - Parallel Session 4: (Meeting Room)**

## **MACHINE LEARNING**

*Chair: Eduardo Solteiro Pires and Ivo Pereira*

Multi-Objective Dynamic Analysis using Fractional Entropy  
*Eduardo Solteiro Pires, José Tenreiro Machado and Paulo Moura Oliveira*

Fishing Monitor System Data: A Naïve Bayes Approach  
*João Ferreira, Serge Lage, Iola Pinto and Nuno Antunes*

Evaluation of the Simulated Annealing and the Discrete Artificial Bee Colony in the Weight Tardiness Problem with Taguchi Experiments Parameterization  
*André Santos, Ana Madureira and Leonilde Varela*

Metaheuristics Parameter Tuning using Racing and Case-based Reasoning in Scheduling Systems  
*Ivo Pereira, Ana Madureira and Bruno Cunha*

Towards Better SWRL Rules Dependency Extraction  
*Abeer Boujelben, Tarak Chaari and Ikram Amous*

A Branch-and-Price Algorithm for the Double Vehicle Routing Problem with Multiple Stacks and Heterogeneous Demand  
*Jonatas Chagas and André Santos*

**13:00-14:00 - Lunch Break**

**14:00-16:00 - Parallel Session 5: (Act Room)**

## **NETWORK AND COMMUNICATION**

*Chair: Ana Madureira and João Ferreira*

Analysing The Performance Of A Tomographic Reconstructor With Different Neural Networks Frameworks  
*Sergio L. Suárez, Carlos González, Jesús D. Santos, María L. Sánchez, Fernando Sánchez-Lasheras and Francisco Javier de Cos*

Similarity And Trust Metrics Used In Recommender Systems: A Survey  
*Maryam Jallouli, Sonia Lajmi and Ikram Amous*

On Pollution Attacks In Fully Connected P2P Networks Using Trusted Peers  
*Cristóbal Medina-López, Ilshat Shakirov, Leocadio G. Casado and Vicente González-Ruiz*

Developing an Ambient Intelligent-Based Decision Support System for Production and Control Planning

*Marco Gomes, Fábio Silva, Filipa Ferraz, António Silva, Paulo Novais and Cesar Analide*

Network Intrusion Detection using Danger Theory and Genetic Algorithms  
*João Santanelli and Fernando Neto*

Emerging Opportunities For Ambient Intelligence In Creativity Support Tools  
*Frederica Gonçalves, Eduardo Fermé and João C. Ferreira*

**14:00-16:00 - Parallel Session 5: (Meeting Room)**

**INFORMATION SYSTEMS AND SOFTWARE ARCHITECTURE I**

*Chair: Ivo Pereira and Eduardo Solteiro Pires*

Robot Swarms Theory Applicable to Seek and Rescue Operation  
*Juan Manuel Calderon and Jose Leon*

Architecture of Adaptive Decision Support System for Intelligent Scheduling  
*Ana Madureira, Ivo Pereira and Bruno Cunha*

Using Intelligent Systems To Improve Case Flow In Court Systems  
*Ana Lúcia Martins*

Enabling The Definition And Reuse Of Multi-Domain Workflow-Based Data Analysis  
*Rubén Salado-Cid and José Raúl Romero*

Memetic Algorithms For The Automatic Discovery Of Software Architectures  
*Aurora Ramírez, Rafael Barbudo Lunar, José Raúl Romero and Sebastián Ventura*

Coupling Event-B/ProB for the analysis of the Software Architecture Evolution described in PDDL  
*Farah Fourati, Mohamed Tahar Bhiri and Riadh Robbana*

**16:00-16:30 - Afternoon Coffee Break**

**16:30-18:10 - Parallel Session 6: (Act Room)**

**Intelligent Applications I**

*Chair: João Ferreira and Toshihiro Kitajima*

Analysing The Performance Of A Tomographic Reconstructor With Different Towards Activity Theory - Preliminary Report: Ambient Intelligence Applied To Smart Education  
*Frederica Gonçalves, Eduardo Fermé, Ana Lúcia Martins and João C. Ferreira*

Three Case Studies Using Agglomerative Clustering  
*Rodrigo Camargos and M. C. Nicoletti*

Agglomerative and Divisive Approaches to Unsupervised Learning in Gestalt Clusters  
*Rodrigo Camargos, Paulo Rogerio Nietto and Maria Do Carmo Nicoletti*

Estimating the Number of Clusters as a Pre-Processing Step to Unsupervised Learning  
*Paulo Rogerio Nietto and Maria Do Carmo Nicoletti*

Human Detection Using Biological Signals In Camera Images With Privacy Aware  
Toshihiro Kitajima, Edwardo Arata Y. Murakami, Shunsuke Yoshimoto, Yoshihiro Kuroda and Osamu Oshiro

**16:30-18:00 - Parallel Session 6: (Meeting Room)**

**Intelligent Applications II**

*Chair: Eliana Costa and Ivo Pereira*

Time Series Data Mining For Energy Prices Forecasting: An Application To Real Data  
*Eliana Costa E Silva, Ana Borges, M. Filomena Teodoro, Marina Andrade and Ricardo Covas*

Knowledge Integration in Collaborative Environments Using Supervised Ontological Alignment  
*Leandro Pupo Natale and Nizam Omar*

An Approach For Measuring Flexibility Of Business Processes Based On Distances Between Models And Their Variants  
*Asma Mejri, Sonia Ayachi and Ricardo Martinho*

Evaluating the Quality of Business Process Models based on measures and Criteria in Higher Education: Developing a Framework for continuous quality improvement  
*Fouzia Kahloun and Sonia Ayachi Channouchi*

**18:30 - End of Conference**

## VIRTUAL PRESENTATION

14<sup>th</sup> - 15<sup>th</sup> December, 2016

Historic Document Image De-Noising using Principal Component Analysis (PCA) and Local Pixel Grouping (LPG)

Tang Han Yang, Azah Kamilah Muda and Choo Yun Huoy

Evaluation method for an adaptive user interface

Rim Rebai

A new trajectory optimization approach for safe mobile robot navigation: a comparative study (Khepera II mobile robot)

Walid Ellili, Abdelfetteh Lachtar and Mounir Samet

Training a Spiking Neural Network to Generate Online Handwriting Movements

Mahmoud Ltaief, Hala Bezine and Adel M. Alimi

CCL: Cognitive Conversation Language

Wesley Willy Oliveira de Souza and Estevam Rafael Hruschka Jr.

A Survey On Outlier Detection In The Context Of Stream Mining : review Of Existing Approaches And Recommendations

Imen Souiden, Zaki Brahmi and Hajer Toumi

A Modified Naive Possibilistic Classifier for Numerical Data

Karim Baati, Tarek M. Hamdani, Adel M. Alimi and Ajith Abraham

Multi-Agent Based Truck Scheduling Using Ant Colony Intelligence in a Cross-docking platform

Houda Zouhaier, Lamjed Ben Said

Forecasting Using Elman Recurrent Neural Network

Emna Krichene, Youssef Masmoudi, Adel M. Alimi, Ajith Abraham and Habib Chabchoub

Patient-specific epilepsy seizure detection using random forest classification over one-dimension transformed EEG data

Marco Antonio Pinto Orellana and Fabio Ribeiro Cerqueira

A new approach to Human Activity Recognition using Machine Learning techniques

Leandro B. Marinho, Amauri Souza Júnior and Pedro Pedrosa Rebouças Filho



Lung Segmentation in Chest Computerized Tomography Images Using the Border Following Algorithm

Murillo Rodrigues, Leandro Marinho, Raul Victor Nóbrega, João Wellington Souza and Pedro Pedrosa Rebouças Filho

ACO-PSO Optimization for Solving TSP Problem with GPU Acceleration

Olfa Bali, Walid Elloumi, Ajith Abraham and Adel Alimi

Comparison of hard and probabilistic evidence in Bayesian model

Rim Rebai

Towards an Approach Based on Ontology for Semantic-Temporal Modeling of Social Network Data

Chiha Rim and Ben Ayed Mounir

New Adaptive Resource Allocation Scheme in LTE-Advanced

Radhia Khdir, Kais Mnif, Aymen Belguith and Lotfi Kamoun

Clustering of Maintenance Tasks for the Danish Railway System

Shahrzad Mohammadpour and Una Benlic

Temporal Patterns Visualization for Knowledge Acquisition In Dynamic Decision-Making Environment

Jihed Elouni, Hela Ltifi, Mounir Ben Ayed and Mohamed Masmoudi

Community Detection in Bipartite Networks Using a Noisy Extremal Optimization Algorithm

Noémi Gaskó, Rodica Ioana Lung and Mihai Suciú

An NLP-based Ontology Population for intentional structure

Noura Labidi, Tarak Chaari and Rafik Bouaziz

CobWeb Multidimensional Model: Visualizing OLAP Query Results Using Tag-Cloud Operators

Omar Khrouf

A new Data Placement approach for Scientific Workflows in Cloud Computing environments

Hamdi Kchaou, Zied Kechaou and Adel M. Alimi

Evaluation of the Simulated Annealing and the Discrete Artificial Bee Colony in the Weight Tardiness Problem with Taguchi Experiments Parameterization

André Santos, Ana Madureira and Leonilde Varela

A Robust and Optimally Pruned Extreme Learning Machine

Ananda Freire and Ajalmar Rocha Neto

Radial Basis Function Neural Networks For Datasets With Missing Values  
Diego Mesquita and João Gomes

A Novel Simulated Annealing-Based Learning Algorithm For Training Support Vector Machines  
Madson Luiz Dantas Dias and Ajalmar Rêgo Da Rocha Neto

Towards NoSQL Graph Data Warehouse for Big Social Data Analysis  
Hajer Akid and Mounir Ben Ayed

From Traditional Data Warehouse To Real Time Data Warehouse  
Senda Bouaziz

A New Social Media Mashup Approach  
Abir Troudi, Corinne Amel Zayani, Salma Jamoussi and Ikram Amous

A Time Delay Neural Network For Online Arabic Handwriting Recognition  
Ramzi Zouari, Houcine Boubaker and Monji Kherallah

Efficient parameterization for Automatic speaker recognition using Support Vector Machines  
Rania Chakroun, Mondher Frikha and Leila Beltaifa

Towards a Medical Intensive Care Unit Decision Support System based on Intuitionistic Fuzzy Logic  
Hanan Jemal, Zied Kechaou and Mounir Ben Ayed

Data Fusion Classification Method Based On Multi Agents System  
Elhoucine Ben Boussada, Mounir Ben Ayed and Adel M.Alimi

Intelligent Traffic Congestion Prediction System Based On ANN And Decision Tree Using Big GPS Traces  
Wiam Elleuch, Ali Wali and Adel Alimi

Linguistic Representation by Fuzzy Formal Concept and Interval Type-2 Feature Selection  
Sahar Cherif, Nesrine Baklouti, Mohamed Adel Alimi and Vaclav Snasel

The Improvement of an Image compression Approach Using Weber-Fechner Law  
Mourad Rahali, Mohamed Salim Bouhlef and Habiba Loukil

Age, Gender, Race And Smile Prediction Based On Social Textual And Visual Data Analyzing  
Onsa Lazzez, Wael Ouarda and Adel M. Alimi

Combinatorial Structural Clustering (CSC): A Novel Structural Clustering Approach For Large Scale Networks

Liang Chen, Hongbo Liu, Weishi Zhang and Bo Zhang

Investigating the Effect of Combining Text Clustering with Classification on Improving Spam Email Detection

Doaa Hassan

## **Keynote Presentations**

### **“Fractional Calculus: Fundamentals and Applications”**

**by J. A. Tenreiro Machado**

#### **Abstract:**

Fractional Calculus (FC) started in 1695 when L'Hôpital wrote a letter to Leibniz asking for the meaning of Dny for  $n = 1/2$ . Starting with the ideas of Leibniz many important mathematicians developed the theoretical concepts. By the beginning of the twentieth century Olivier Heaviside applied FC in the electrical engineering, but, the visionary and important contributions were forgotten. Only during the eighties FC emerged associated with phenomena such as fractal and chaos and, consequently, in nonlinear dynamical. In the last years, FC become 'new' tool for the analysis of dynamical systems. This lecture introduces the FC fundamental concepts and presents several applications in distinct areas of science and engineering.

#### **Short Bio:**

Name: J. Tenreiro Machado

Institute of Engineering, Polytechnic of Porto, Dept. of Electrical Engineering, Porto, Portugal, email: [jtm@isep.ipp.pt](mailto:jtm@isep.ipp.pt)

URL: <http://ave.dee.isep.ipp.pt/~jtm/>

J. Tenreiro Machado obtained PhD and Habilitation in Electrical and Computer Engineering in 1989 and 1995, respectively.

He is presently Coordinator Professor with Habilitation at the Dept. of Electrical Engineering, Institute of Engineering, Polytechnic of Porto, Portugal.

His research Interests are: Complex systems, Nonlinear Dynamics, Fractional Calculus, Modeling, Control, Data series analysis, Biomathematics.

### **“ Industry 4.0: Facts, myths and where to start”**

Francisco Almada Lobo

#### **Abstract:**

Industry 4.0 offers an unprecedented opportunity for transformational success. And it is different from any of the previous revolutions in two major ways: It has been predicted, which allows companies to develop a plan and roadmap for their own adoption; and, beyond increasing the efficiency and

productivity of manufacturing, it actually opens up entirely new business opportunities.

This presentation will introduce Industry 4.0 concepts; discuss the challenges that come with it, within and beyond the manufacturing facilities; and explore what can companies do today to be ready for that journey.

**Short Bio:**

Francisco Almada Lobo holds an MBA and an Electrical Engineering Degree from University of Porto. He started his career in a CIM R&D institute, and joined Siemens Semiconductor in 1997. Throughout Siemens, Infineon and Qimonda, he gained experience in several manufacturing areas having, in 2004, led the first migration of an MES system in a running high-volume facility. Between 2005 and 2009, he managed the Porto Development Center for Infineon and Qimonda, with implementation of automation projects in the group plants worldwide.

Francisco acted as Chief Operating Officer of Critical Manufacturing where, among other areas, he was responsible for the Product business unit. Since 2010 he's the company's CEO.

