Special Session:

Evolutionary Computing Methods for Data Mining: Theory and Applications

Organizers:

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Prof. Dr. Javier Del Ser, University of the Basque Country (UPV/EHU) and Basque Center for Applied Mathematics (BCAM), Bilbao, Spain and TECNALIA Research and Innovation. javier.delser@ehu.es. https://scholar.google.com/citations?user=p_wY0zUAAAAJ

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Evolutionary Computation has a great popularity in the current scientific community, being the focus scope of many research contributions in the literature year by year. The rationale behind the acquired momentum by this broad family of methods lies on their outstanding performance evinced in hundreds of research fields and problem instances. In this regard many different inspirational sources can be found for these solvers, such as the behavioral patterns of ants or swarms of particles, as well as the mechanisms behind genetic inheritance and brain connections.Furthermore, this type of techniques is being applied to a wide range of problems and areas of knowledge, such as transportation, medicine or industry. The proposed special session is focused on the development of Evolutionary Computingmethods and their application to data mining, data science and big data. More specifically, we will analyze the latest theoretical advances on the use of this kind of techniques in any of the aspects and processes related with data science, as well as the latest real-world applications regarding this topic.

This Special Session to be held during IDEAL 2018 has as objective to bring researchers and experts together to discuss and share their experiences. The session will provide a platform to share the current and new research topics and ideas, increasing international collaborations researchers. The topics of interest include, but are not limited to:

- Data mining, Data science and Big Data.
- Recent advances on nature inspired methods for data science, with emphasis on those inspired by biological processes and behaviors typically observed in Nature, such as Particle Swarm Optimization, Ant Colony and Genetic Algorithms.
- Novel applications of evolutionary computing methods to data mining, with priority on real-world scenarios.
- Nature-inspired heuristics, Evolutionary Algorithms, Swarm Intelligence, Hyper Heuristics, Memetic Computing, and Distributed Evolutionary Techniques.
- Evolutionary Computing methods for supervised and unsupervised data mining
- Combining/Hybridizing Evolutionary Computing techniques with machine learning and data mining techniques.
- Recent advances on neural networks: Hebbian Learning, Convolutional Neural Networks, Neural Gas, Recurrent Neural Networks, Multi-Layer Perceptrons, Generative Adversarial Networks, Capsnets, ResNets…

- Evolutionary Computing methods for feature selection and/or instance generation/selection
- Implementation of Nature-inspired methods using Big Data technologies
- Evolutionary Computingmethods for Deep Learning

Brief Biographies of Session Organizers:

Dr. Eneko Osabaworks at TECNALIA as researcher in the ICT/OPTIMA area. He received the B.S. and M.S. degrees in computer sciences from the University of Deusto, Spain, in 2010 and 2011, respectively. He obtained his Ph.D. degree on Artificial Intelligence in 2015 in the same university, being the recipient of a Basque Government doctoral grant. He has participated in the proposal, development and justification of 13 research projects. He has participated in the development of more than 50 papers, having 16 of them JCR Impact factor. He has performed several stays in universities of United Kingdom, Italy and Malta. He served as a member of the program and/or organizing committee in more than 10 international conferences, and he is member of the editorial board of the International Journal of Artificial Intelligence. He is an Individual Ambassador for ORCID since February 2017.

Prof.Dr. Javier Del Ser received his first PhD in Telecommunication Engineering (Cum Laude) from the University of Navarra, Spain, in 2006, and a second PhD in Computational Intelligence (Summa Cum Laude) from the University of Alcala, Spain, in 2013. He is currently a visiting fellow at the Basque Centre for Applied Mathematics (BCAM), a part-time lecturer at the University of the Basque Country (UPV/EHU), and researcher in data analytics and optimization at TECNALIA (Spain). His research interests gravitate on the use of descriptive, prescriptive and predictive algorithms for data mining and optimization in a diverse range of application fields such as Energy, Transport, Telecommunications, Health and Industry, among others. In these fields he has published more than 190 articles, co-supervised 6 Ph.D. theses, edited 4 books, co-authored 6 patents and participated/led more than 35 research projects. He is a senior member of the IEEE.

Prof. Dr. Sancho Salcedo-Sanzwas born in Madrid, Spain, in 1974. He received the B.S. degree in physics from the Universidad Complutense de Madrid, Madrid, Spain, in 1998, and the Ph.D. degree in telecommunications engineering from the Universidad Carlos III de Madrid, Madrid, Spain, in 2002. He spent one year in the School of Computer Science, The University of Birmingham, Birmingham, U.K., as postdoctoral Research Fellow. Currently, he is an Associate Professor at the Department of Signal Processing and Communications, Universidad de Alcalá, Madrid, Spain. He has coauthored more than 230 international journal and conference papers in the field of machine learning and soft-computing. Dr. Salcedo-Sanz has received different research awards in his career, such as the Universidad de Alcalá's Best Young Researcher award in 2009, the 3M Innovation award in 2010 and the Price of the Social Council of University of Alcalá award to technology transfer in 2011. His current interests deal with soft-computing techniques, hybrid algorithms, and neural networks in different applications of science and engineering.

Dr. Antonio D. Masegosa took his B.E. degree in Computer Engineering in 2005 and his PhD in Computer Sciences in 2010, both from the University of Granada, Spain. From June 2010 to November 2014 he was a post-doc researcher at the Research Center for ICT of the University of Granada. In 2014 he received an IKERBASQUE Research Fellowship to work at the Mobility Unit of the Deusto Institute of Technology, in Bilbao, Spain. He has published four books, eighteen JCR papers, and more than 20 papers in both international and national conferences. He has supervised one PhD thesis and one MSc Thesis, and he is currently co-supervising two PhD theses. He has been principal investigator in one research project and he has participated in a dozen of research projects at a regional, national and international level, among them TIMON (H2020). He is member of the program committee of international conferences as IEEE CEC, GECCO, ICCCI, ECAL, HM or NICSO. He has served as reviewer in international journals as Information Sciences, Neurocomputing, Optimization Letters, European Journal of Operational Research and Memetic Computing.