Special Issue Title: Heuristic acquisition for data science

Subject Field: Data sciences

Keywords: Heuristic acquisition, generalization, heuristic logics, optimization, deep learning, machine learning.

Description

Systems are becoming more and more complex and dynamic. This upswing increases the demand to find search techniques that can get a good enough solution in a reasonable time.

In another side, a huge amount of data has been accumulated over the years. These data hide treasures for different fields and may be used for many purposes; with data, one can (1) analyze the behavior of competitors and consumers and predict their future behaviors, (2) understand the system better and then generalize the available knowledge or even generate new knowledge, (3) diagnose faults in strategies and systems, etc. Traditional approaches in statistics, machine learning, and traditional data analysis fail to address this level of complexity. The need thus arises for better approaches that can handle complex models and analyze the available data in a reasonable amount of time.

Heuristics are algorithmic methods, which favor quick responses to the detriment of the accuracy of the answer. This special issue seeks to answer to the following questions: What does heuristic acquisition contribute to the problem-solving process? What do they make solvable, which would not be in their absence? Which among a plethora of techniques for heuristic acquisition are best and why, etc.?

This Special Issue calls for scientific contributions as well as industrial experiences in applying heuristics to one or more of the following areas:

- Heuristics for optimizing deep neural architectures
- Numerical analysis
- Healthcare
- Knowledge-based reasoning
- Diagnostics and prognostics
- Planning
- Optimization
- Combinatorial analysis
- Scarce-resource allocation
- Meteorology
- Natural language processing
- Speech recognition
- Game theory
- Decision support systems

- Transportation/autonomous vehicles
- Evolutionary systems
- Prospecting (water, oil, gas, coal, uranium, *et al.*)
- vulcanology
- Chemistry/Physics/Molecular biology
- Catalysis
- Computer design
- Computer vision and image processing

This special issue will contain extended versions of the best paper of IEEE IRI'19 conference.

Important Dates
Submission deadline: 01 January 2020
Author notification: 01 March 2020
Revised paper due: 01 April 2020
Final notification: 01 May 2020
Final paper due: 01 June 2020

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Short Biographies

Dr. Stuart H. Rubin is a senior scientist at the Space and Naval Warfare Systems Center (SSC) in San Diego, code 71740 (Advanced Concepts & Applied Research). He was previously a tenured associate professor of computer science at Central Michigan University (CMU). He received a Ph.D. in Computer and Information Science from Lehigh University in 1988. He was previously an ONT Post-Doctoral Fellow, at NOSC, for three years. He has over 35 assigned Navy patents, over 295 Refereed Publications, and received SSC-PAC's Publication of the Year Awards in 2007, 2009, 2010, and 2011. He was co-editor (with T. Bouabana Tebibel) of three Springer books in the Advances in Intelligent Systems and Computing series. Dr. Rubin is a SIRI Fellow and serves in leadership roles in numerous IEEE technical societies.

Dr. Lydia Bouzar-Benlabiod is an assistant professor at Laboratoire de Communication des Systèmes Informatiques (LCSI), Ecole nationale Supérieure d'Informatique (ESI, Algeria). She received a Ph.D. degree in Computer Science from ESI and from Université d'Artois (France) in 2015. She received a magisterial degree from ESI in 2010. She is a member of The International Society of Applied Intelligence. She was co-editor (with Dr Stuart Rubin) of a book Springer and a journal Special Issue.

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