Tentative Outline

Special Thematic Issue for The Open Artificial Intelligence Journal

Heuristic acquisition and knowledge discovery methods for data science

Guest Editors: Stuart H. Rubin

Co-Guest Editor: Lydia Bouzar-Benlabiod

Aims & Scope:

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.?

Keywords: Heuristic acquisition, knowledge discovery, generalization, heuristic logics, optimization.

Subtopics:

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
- Theorem proving
- Automatic programming
- Healthcare
- Knowledge-based reasoning
- Logistics
- Diagnostics and prognostics
- Planning
- Optimization
- Combinatorial analysis
- Scarce-resource allocation
- Engineering (all branches)
- Meteorology
- Database organization and retrieval
- Natural language processing
- Speech recognition
- Game theory
- Decision support systems

- Space science
- Transportation/autonomous vehicles
- Evolutionary systems
- Prospecting (water, oil, gas, coal, uranium, *et al.*)
- vulcanology
- Chemistry/Physics/Molecular biology
- Catalysis
- Alloys
- Superconductivity
- Computer design
- Computer vision and image processing
- All types of problems involving search and discovery (reference Polyga's, "How to solve it")

Schedule:

- **Manuscript submission deadline:** 01 January 2020
- **Peer Review Due:** 01 March 2020
- **Revision Due:** 01 April 2020
- **Announcement of acceptance by the Guest Editors:** 01 May 2020
- **Final manuscripts due:** 01 June 2020

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