Cognitive Data Science Methods and Models for Engineering Applications

Aim and Scope:

Cognitive computing has broad horizons, which cover different characteristics of cognition. The field is highly trans-disciplinary in nature, combining ideas, principles and methods of psychology, computer and Internet technologies, linguistics, philosophy, neuroscience, etc. Cognitive computing is the creation of self-learning systems that use data mining, pattern recognition and natural language processing (NLP) to solve complicated problems without constant human oversight. Cognitive computing will bring a high level of fluidity to analytics. This special issue explores domain knowledge and reasoning of data science technologies and cognitive methods over the engineering applications. The idea of embodying this concept would be to extend existing data technologies approaches by incorporating knowledge from experts as well as a notion of artificial intelligence, and performing inference on the knowledge. The main focus is design of best cognitive embedded data technologies to process and analyse the large amount of data collected through various sources and help for good decision-making.

The new frontier research era and convergence of cognitive data science methods and models with reference to engineering has three main streams needs to be addressed in the current scenario: bio informatics, medical imaging, and sustainable engineering and so on. This special issue is integrating machine learning, cognitive neural computing parallel computing paradigms, advanced data analytics and optimization opportunities to bring more compute to the real world engineering problems and challenges. Further, it is importance to make a note that convergence of cognitive computing and data science methods and its intelligence techniques has not been adequately investigated from the

perspective of engineering research streams (bio-informatics, medical imaging, and sustainable engineering) and its related research issues.

Furthermore, there are many noteworthy issues (health informatics, bio-image informatics energy efficiency etc) that need to be addressed in the context of cognitive computing and engineering. Obviously, these challenges also create immense opportunities for researchers. For the aforementioned reasons, this special issue focuses to address comprehensive nature of cognitive computing, and to emphasize its character in human intelligence and learning systems, complex analysis tasks mimic human cognition and learning behaviour, prediction and control of engineering systems. This special issue intends to give an overview of state-of-the-art of issues and solution guidelines in the new era of cognitive computing paradigm and its recent trends of techniques for real world engineering applications. Proposed submissions should be original, unpublished, and present novel in depth fundamental research contributions either from a methodological/application perspective in understanding the fusion of cognitive computing and machine learning paradigms and their capabilities in solving a diverse range of problems in for engineering and its real-world applications.

Topics of Interest:

We seek original and high quality submissions related to one or more of the following topics:

- Cognitive computing models and prediction analytics for engineering
- Cognitive support and cognitive automation for human sense-making and decision making processes for engineering
- Theoretical results on representation of cognitive computing architectures for engineering applications
- Cognitive, reactive and proactive systems for Bio-informatics
- Formal conceptual models of human brain data, architectures and machine intelligence for engineering aspects
- (Big) data analytics & data science for real world engineering applications
- Artificial Intelligence enhance cognitive computing environments
- Novel feature representation using deep learning, dictionary learning for face, fingerprint, ocular, and/or other biometric modalities

- Novel distance metric learning algorithms for biometrics modalities
- Machine learning techniques (e.g., Deep Learning) with cognitive knowledge acquisition frameworks for sustainable energy aware systems
- Visual analytics to identify patterns and processes for mining large engineering datasets
- Cognitive computing approaches to crafting, evaluating and intervening upon immersive, networked, user experiences particular to bio engineering learning contexts
- Applications of deep learning and unsupervised feature learning for prediction of sustainable engineering tasks.
- Inference and optimization with engineering problems

Important Dates

- Paper submission due: September 1, 2018
- First-round acceptance notification: November 15, 2018
- Revision submission: January 15, 2019
- Notification of final decision: March 30, 2019
- Submission of final paper: April 30, 2019
- Publication date: Decided by EiC

Submission Guidelines

Before submission authors should carefully read over the Instructions for Authors, which are located at:

http://www.springer.com/engineering/computational+intelligence+and+complexity/journal/500. Prospective authors should submit an electronic copy of their complete manuscript through the Springer submission system at https://www.editorialmanager.com/soco/default.aspx according to the submission schedule. Please select the special issue **'S.I. : Cognitive Data Science Method and Model for Engineering Application'** for your submission. All submissions will undergo initial

screening by the guest editors for fit to the theme of the Special Issue and prospects for successfully negotiating the review process.

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