IEEE Transactions on Fuzzy Systems

Call for Papers

Deep Neuro-Fuzzy Approaches for Intelligent Big Data Processing

Deep learning techniques, such as deep neural networks (DNNs), have successfully solved problems that have challenged the AI community for years. However, DNNs have been criticized for their black-box nature and lacking interpretability. This downside has recently prompted the research community to explore hybrid approaches, leading to the emergence of novel hybrid systems classified as deep neuro-fuzzy systems (DNFS). In the era of big data, computational analysis is required to identify hidden patterns and associations, both internal and external. This analytical process is critical in order to articulate the potential benefits of the data to the larger application or system. Therefore, the use of advanced computational techniques, such as DNFS, is essential to efficiently and effectively analyze the data and extract meaningful insights. Through this approach, it is possible to uncover valuable information that can be used to make informed decisions and drive improvements across a variety of applications and systems. DNFS has shown high interpretability and reasonable accuracy, making it an attractive option for a wide range of applications. There has been a rapid increase in studies focusing on the implementation of DNFS in various domains such as computing, healthcare, transportation, and finance.

While DNFS approaches can benefit big data processing, there are still challenges before full-scale integration. The challenge lies in two folds: first, specialized solutions will continue to develop for the most attractive use cases and new capabilities are already being added to existing solutions, and second, there is a deep need to understand the bigger picture on how DNFS will fit in an evolved network architecture and data scale. To this end, the objective of this special issue is to solicit the submission of high-quality papers from leading researchers actively working in the emerging field of DNFS to address the following fundamental themes:

- DNFS for big data-driven smart systems/city/home/healthcare
- DNFS for data cleaning in big data systems
- Explainable and generalizable DNFS for big data mining
- DNFS for big data flow optimization
- DNFS-based multimodal platforms, systems, and architecture
- DNFS for big data-driven decision support systems
- DNFS for big data-driven internet of things
- DNFS for big data warehouse, clustering and visualization
- DNFS for data security and privacy in big data systems
- Data fusion and management in smart DNFS systems
- Ubiquitous neuro-edge computations for fuzzy systems
- Trust, security, privacy, and fairness in DNFS
- Advanced training mechanism and hyperparameter tuning for DNFS

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