Complex systems are nonlinear systems composed of agents that can act with local environmental information. As the agents are usually of a high degree of complexity, such systems require a huge amount of data to extract appropriate insights for their decision-making. To support huge-volume data sensing, collection, storage, transmission, management, and analytics, cloud/edge computing and Internet of Things (IoT) have been leveraged as the supporting computation infrastructure, making the big data technology a recent disruptive revolution in the IT industry. The enormous commercial benefits, scientific advances, management efficiency, and analytical accuracy brought by big data have been recognized and further developed for a wide range of applications including complex systems.

Due to the complexity of a complex system, the engaged agents and the data they work on are often geographically distributed across a suite of computation resources. Traditionally, this is supported by cloud computing where an enormous server farm with thousands of computing servers are used to provision computation capability. Although the cloud service providers have placed multiple cloud centers across the whole world, the data transmission delay between the data sources and the cloud centers is still problematic for many complex systems where responses are usually required to be time critical or real-time. Instead, a recently emerging computation paradigm, edge computing, is promising to cater for these requirements, as edge computing resources are deployed data sources which support time critical or real-time data processing and analysis. Together with the cloud computing as the computation backend, edge computing has been adopted in complex systems. However, it is still a challenge to conduct big data management and analytics in complex systems which are supported by edge, given the complexity of complex systems and the unique features of edge computing.

Collaborative methodology has been gradually recognized as an effective way to handle the complexity in a complex system. For instance, computational intelligence based approaches enable agents in a complex system to learn a particular task of the system from big data to further facilitate complicated problem-solving, and these play an increasing important role in complex systems. Given that these approaches are usually not inherently designed for big volumes of data, it is quite interesting to investigate research problems such as how they handle big data for complex systems and design more scalable computational intelligence methods accordingly. Also, many emerging collaborative data analysis paradigms such as federated learning from distributed data have been put forth for real applications. Therefore, it is of both theoretical and practical importance to investigate collaborative innovation for big data management and analytics in complex systems with advanced computing infrastructure like edge, which highly demands great research efforts from researchers and practitioners.

The purpose of this special issue is to solicit both high-quality original research and review articles on the recent advances of collaborative big data management and analytics in complex systems with edge computing.

Potential topics include but are not limited to the following:

- Complex system modeling in the cloud/edge/IoT environment
- Knowledge based collaboration in complex systems with edge computing
- Decision-making collaboration over big data for complex systems
- Computational intelligence in big data-driven complex systems
- Collaborative machine learning models for complex systems
- Collaborative recommendation methods over big data for complex systems
- Security, privacy, and trust issues in big data-driven complex systems

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