Call for Papers
Special Issue of IISE Transactions
Data Analytics and Decision Making for Internet-of-Things (IoT) Enabled Systems

We are living in the age of IoT, where internet-of-things (IoT) enabled systems are ubiquitous. An IoT device, broadly defined, is a device connected to the internet, allowing users to access its data and to control its functions remotely. The ubiquitous availability of IoT devices has the great potential of bringing broad disruptive societal impacts, particularly on economic competitiveness, quality of life, public health, and essential infrastructure. For example, (1) In manufacturing systems, we can collect data from all the workstations to make system operations transparent and enable smart operation decisions to improve various key performance measures. (2) Through smart home appliances, we can obtain their usage pattern and then control their operations accordingly for enhancing home security and optimizing energy use. (3) By providing wearable devices to patients, we can monitor their physiological condition in real time and collect observations of daily living (ODL) data, which can be used for more accurate diagnosis and clinical intervention. (4) By observing the failure events from multiple units, we can establish a fleet-based reliability model and make individualized failure prognosis.

In this IoT age, a large amount of data from multiple similar subjects/devices/machines are available in real time. The dimension and volume of the data collected is often very large and contains data of different fidelities and diverse types (data streams, images, videos, continuous, discrete, etc.). These features set forth the need to rethink many traditional predictive and prescriptive methods to adapt to (1) unique data features collected in IoT settings (2) the need for individualized inference while still leveraging information across subjects (3) real-time predictions and decisions often at very high frequencies.

This special issue aims to publish original, significant, and visionary papers describing scientific methods and technologies with both solid theoretical development and practical importance for IoT enabled systems. Topics to be covered include, but are not limited to:

- Data analytics and machine learning methods for IoT enabled systems, such as individualized inference, hierarchical model, multitask learning, federated learning, physics-informed deep learning, online/active learning.
- Data driven decision-making methods for IoT enabled system operation optimization such as mathematical programming under uncertainty, real-time control, Markov decision making, reinforcement learning.
- Advanced quality control techniques for IoT enabled systems, e.g., online statistical monitoring, root cause identification, quality assessment and validation.
- Fleet-based system reliability and prognosis and maintenance decision-making

- Data driven IoT enabled operation-inventory-service decision-making and optimization
- IoT enabled supply chain management
- IoT-enabled system design and operations in service and manufacturing
- Cybersecurity and privacy in engineering systems
- IoT applications in smart manufacturing such as cloud manufacturing, production control and optimization
- IoT applications in healthcare such as real time patient monitoring and intervention, bystander tele-coaching during emergency rescue, remote medicine tracking and inventory control
- IoT applications in infrastructure, energy management, transportation, and vehicle telematics

All papers are to be submitted through http://mc.manuscriptcentral.com/iietransactions. Please select "*Special Issue*" under Manuscript Category of your submission. All manuscripts must be prepared according to the *IISE Transactions* publication guidelines.

Important Dates
- Manuscript submission deadline — March 1st, 2021
- Notification of disposition of the manuscript — May 1st, 2021
- Revision due — July 1st, 2021
- Paper acceptance decision — October 1st, 2021
- Publication date — Winter 2021

Guest Editors
- Professor Shiyu Zhou, University of Wisconsin-Madison, email: shiyuzhou@wisc.edu
- Professor Yong Chen, University of Iowa, email: yong-chen@uiowa.edu
- Professor Nan Kong, Purdue University, email: nkong@purdue.edu
- Professor Raed Al Kontar, University of Michigan, email: alkontar@umich.edu