Federated Learning based Industrial Internet of Things (IIoT) using Smart Technologies

Theme and Scope

Technological changes are at a huge pace. There are many technologies that have emerged in recent times. These technologies have emerged to overcome the need of growing data on the Internet. To enhance security in Internet, Blockchain technology has emerged and is useful at a greater pace. With tremendous growth in number of devices, Internet of Things (IoT) technology have grown up with a rapid rate. This has a huge impact on Industrial Internet of Things (IIoT) as well. Machine learning plays an important role in IIoT. When IIoT is applied to Blockchain, enhanced security will be applied and as a result the model will be more secure. Decentralized form of machine learning is referred to as Federated learning. In this type of learning, data is collected from numerous edge devices like mobile phones, ipads, laptops etc., and then this data is centralized at one single location i.e. to a server that is having a centralized access to all devices, thus resulting in a central model. Such type of learning (Federated learning) enhances capabilities of devices at edges and this is a growing need for IIoT with smart technologies.

Many different solutions in Industrial Internet of Things (IIoT) have been proposed to address the issues and challenges considering smart technologies and other aspects using Internet of Things (IoT). However, they are not properly designed to address the emerging needs of the society. Many service parameters are yet uncovered that needs to be focused for enhancement of quality of service like scalability issues, secure migration issues, intelligent systems, issues arising during resource allocation and scheduling, manufacturing issues, authentication and authorization issues, minimization of energy efficiency and reduction of computational costs. Therefore, use of appropriate IIoT devices for effective modelling of devices using federated learning is the key factor especially for emerging factories in the world of “smart” devices. We solicit original contributions on novel federated learning modelling methods and tools, enhancing security and privacy with blockchain technology, use of artificial intelligence and applications of AI-based technology for effective modelling towards federated learning using Industrial Internet of Things (IIoT). We also seek contributions motivated by taking real-world society and deployment problems and theoretical works that have clear intention for practical applications towards federated learning modelling using Industrial Internet of Things (IIoT). To meet the requirements of emerging techniques in Industrial Internet of Things (IIoT) and the innovation in federated learning modelling process etc. should be an efficient and safe way-out to pursue with optimized and enhanced network of devices. This special session seeks to bring researchers, scholars and participators towards technology factors to govern and devise models using federated learning using Industrial Internet of Things (IIoT) to address challenges and present effective solutions in growing technological world.

Topics include but are not limited to:

- Modelling for Industrial Internet of Things (IIoT)
- Secure Federated modelling using emerging Technologies
- Robotics for Secure Industrial Internet of Things (IIoT)

- Secure data transmission in Federated learning modelling
- Private data sharing in industrial IoT using Blockchain
- Methods and systems for federated learning
- Secure Intelligent decision-making Industrial Internet of Things (IIoT)
- Blockchain based federated learning for failure detection in Industrial IoT
- Services provisioning with federated learning in Industrial IoT
- Secure data migration issues and AI-based solutions for federated learning
- Federated Learning based Visual Worlds Disease tolerance abilities in Industrial Internet of Things (IIoT)
- Intelligent theoretical and mathematical models for decision-making
- Learning from data streams using Industrial Internet of Things (IIoT)
- Humanoid robots for assisting doctors using federated learning and Blockchain
- Futuristic technologies based on Federated Learning and Blockchain in IIoT
- Drones and robots working as health workers
- Federated Learning towards e-Healthcare systems
- Preventative Measures using Artificial Intelligence
- Graphical automation using Machine Learning algorithms
- Communication-efficient federated learning for edge networks in industrial IoT

Special Session Organizer:

Dr. Simar Preet Singh, Bennett University, Greater Noida;

Special Session Co-Organizers:

Dr. Umesh Gupta, Bennett University, Greater Noida;

Dr. Vishal Shrivastava, Bennett University, Greater Noida;

Dr. Shashank, Thapar Institute of Engineering and Technology, Patiala