

Book Title: Intelligent Techniques for Cyber-Physical Systems

Introduction

Cyber-Physical Systems (CPS) integrate computation, networking, and physical processes with minimal human interventions for automated systems. CPS and related technologies include Internet-of-Things (IoT), Industrial IoT, Smart Cities, Smart Grid, and "Smart" Anything. The advancement in CPS will lead to progress in emergency response, health care, transportation & traffic flow systems, home care, education, electric power generation, delivery systems, and other areas. In CPS, it is required to handle the challenges of many cutting-edge technologies, including IoT communication & computation Protocols, interoperability, development, and management of distributed, context-aware, and self-adaptive IoT applications, containerization, automation & dynamic orchestration mechanisms for Cloud, Fog, and Edge computing paradigms, 5G, massive IoT deployments, human-centric solutions, efficient IoT data storage, knowledge graphs, federated learning, data privacy, and security, Blockchain, and many others.

Intelligent techniques consist of designing and applying biologically and linguistically motivated computational paradigms. It comprises three main constituents, i.e., neural networks, fuzzy systems, evolutionary computation, and other evolving systems such as ambient intelligence, artificial life, cultural learning, artificial endocrine networks, social reasoning, and artificial hormone networks. Intelligent techniques combine different techniques and paradigms to address the current and upcoming challenges of complex real-world problems of CPS.

This book introduces and explores intelligent techniques, including AI methods, to enhance and enrich cyber-physical systems. It addresses the open issues and challenges, applications, and advancement of Intelligent computational techniques and cyber-physical systems. It includes handling and modeling real-time data, predicting system behavior, security, reliability, performance, and deployment strategies in Healthcare, military, agriculture, transport, energy, infrastructure, smart cities, smart home, disaster management, etc. It also encompasses sustainable systems, blockchain platforms to resolve security issues, Cloud, fog, IoT, etc.

Recommended Topics (Not Limited to)

- Introduction to Cyber-Physical Systems and Intelligent Techniques
- Security & Data Protection Issues in Cyber-Physical Systems
- Deep-Learning Based Model for Cyber-Physical Systems
- Quantum and Blockchain-Based Serverless Edge Computing
- QoS-aware Computation Offloading between Edge-enabled Cloud and IoT
- ML-Enabled Methods for Resource Provisioning in Cloud Computing and IoT
- Major Security Issues and Data Protection in Cloud Computing and IoT
- Trust Management System for Internet of Things and Internet of Everything
- Blockchain for Cloud of Things (CoT)
- Blockchain Platform to Resolve Security Issues in Fog-enabled Computing Environment
- Blockchain for Sustainable Agriculture and Food Supply Chain
- Cloud, Edge, and Fog Computing for IoT and Intelligent Robotics
- IoT, Cloud Computing, and Sensing Technology for Smart Cities
- Current and Future Trends in Intelligent Transportation Systems with Applications of AI
- Business Intelligence with AI in Sustainable Agriculture
- Intelligent IoT and Unmanned Aerial Vehicles for Sustainable Agriculture
- Unmanned Aerial Vehicle (UAV) Path Planning using Meta-Heuristics Algorithms
- Reinforcement Learning Assisted Meta-Heuristic Algorithms for Combinatorial Optimization Problems
- Remote Sensing Image Segmentation using Meta-Heuristics Algorithms
- Smart IoT Devices for the Healthcare System
- AI and IoT-based Healthcare System with Body Sensor Network
- AI and IoT in Supply Chain Management and Disaster Management
- Intelligent 5G Networks and Augmented Virtual Reality in Smart Transportation
- Deep Learning-based Intelligent Systems and Natural Language Processing
- Opportunities, and Open Research Directions in Cyber-Physical Systems

Important Dates

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