


## Chapter 9

# Artificial Intelligence and Blockchain Technology for Secure Smart Grid and Power Distribution Automation

**Zahira Tabassum**

 <https://orcid.org/0000-0002-4912-0228>

*HKBK College of Engineering, India*

**Rashmi Rani Samantaray**

*HKBK College of Engineering, India*

**Syeda Husna Mohammadi**

*HKBK College of Engineering, India*

**Anees Fathima**

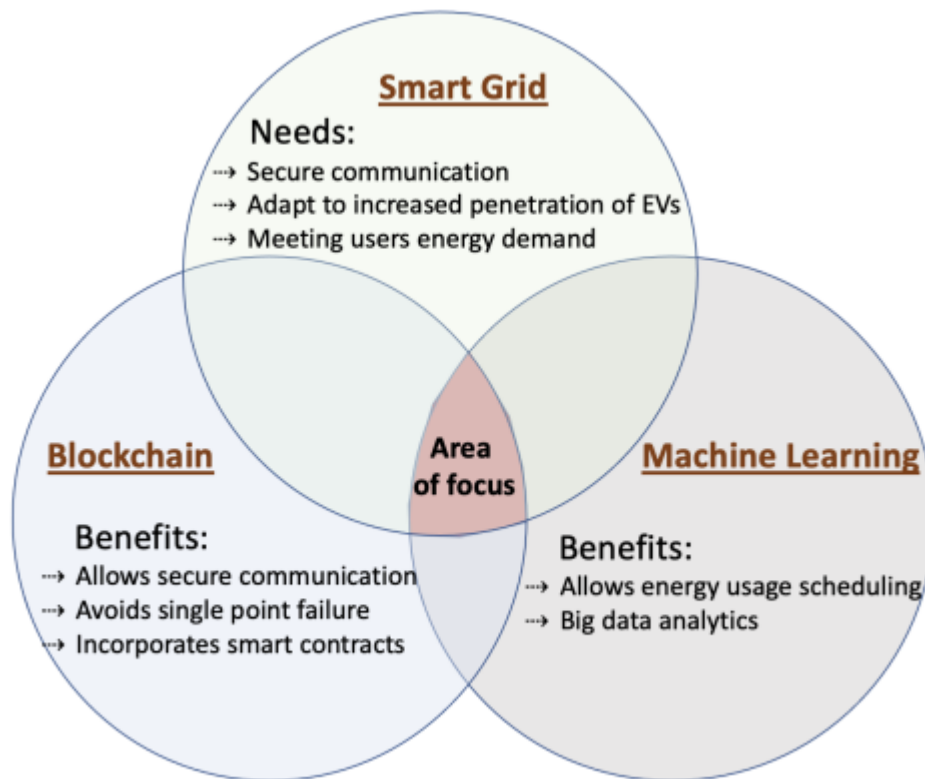
*HKBK College of Engineering, India*

### ABSTRACT

*A country's growth is gauged with reference to its power consumption and energy use, both of which are fast expanding. Energy consumption management improves energy generation and delivery. The smart grid is a tremendous improvement over the power system of the 20th century, using two-way electrical and communication exchanges to create a sophisticated, distributed, computerized energy delivery network. The fields of artificial intelligence (AI) and block chain distributed ledger technology (BDLT) are the most fascinating areas of study in the field of green energy and related power automation. An in-depth analysis of the most advanced automated planning, governance, optimization, confidentiality, and safety methods for the distribution of power and smart grid using integrated artificial intelligence and block chain is presented in this chapter.*

DOI: 10.4018/979-8-3693-0659-8.ch009

*Figure 1. AI and blockchain in smart grids*



## **INTRODUCTION**

The smart grid concept was put forth to guarantee effective electricity distribution, maintain minimal losses and high levels of quality, and assure the security of the electrical supply. The rapid advancement of information and communication technology has led to a new paradigm in the usage of the electric power grid and associated operations. A safe control centre platform for state estimation is provided by the cooperative method of block chain, AI, and wireless sensor networks (WSN), which aids in the detection and analysis of erroneous data flow. The evaluation of technology is being seriously impacted by a number of new challenges in the field of Blockchain-AI in a green environment, such as monitoring of uncertainties, optimal flow of power, reconfiguration of network, the commitment of units with security restrictions, as well as govern auto-generation.

Artificial intelligence (AI) and blockchain technology can play significant roles in enhancing the security and efficiency of smart grids and power distribution automation systems. Figure.1 shows the correlation of AI and block chain in smart grids (Moloth,2023). This chapter covers the overview of smart grids, role of AI and block chain in smart grids followed by case study of application of AI and block chain in overall functioning of smart grids.

25 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:  
[www.igi-global.com/chapter/artificial-intelligence-and-blockchain-technology-for-secure-smart-grid-and-power-distribution-automation/336081](http://www.igi-global.com/chapter/artificial-intelligence-and-blockchain-technology-for-secure-smart-grid-and-power-distribution-automation/336081)

## Related Content

---

### Volume Control by Adjusting Wrist Moment of Violin-Playing Robot

Koji Shibuya, Hironori Ideguchi and Katsunari Ikushima (2012). *International Journal of Synthetic Emotions* (pp. 31-47).

[www.irma-international.org/article/control-adjusting-wrist-moment-violin/70416](http://www.irma-international.org/article/control-adjusting-wrist-moment-violin/70416)

### Chemical Plume Tracing and Mapping via Swarm Robots

Wei Li and Yu Tian (2016). *Handbook of Research on Design, Control, and Modeling of Swarm Robotics* (pp. 421-455).

[www.irma-international.org/chapter/chemical-plume-tracing-and-mapping-via-swarm-robots/142012](http://www.irma-international.org/chapter/chemical-plume-tracing-and-mapping-via-swarm-robots/142012)

### Parallel Architecture Manipulators for Use in Masticatory Studies

Madusudanan Sathia Narayanan, Srikanth Kannan, Xiaobo Zhou, Frank Mendeland Venkat Krovi (2011). *International Journal of Intelligent Mechatronics and Robotics* (pp. 100-122).

[www.irma-international.org/article/parallel-architecture-manipulators-use-masticatory/61159](http://www.irma-international.org/article/parallel-architecture-manipulators-use-masticatory/61159)

### A Framework for Prototyping of Autonomous Multi-Robot Systems for Search, Rescue, and Reconnaissance

Sedat Dogru, Sebahattin Topal, Aydan M. Erkmen and Ismet Erkmen (2012). *Prototyping of Robotic Systems: Applications of Design and Implementation* (pp. 407-437).

[www.irma-international.org/chapter/framework-prototyping-autonomous-multi-robot/63542](http://www.irma-international.org/chapter/framework-prototyping-autonomous-multi-robot/63542)

### A Novel Multiobjective Optimization for Cement Stabilized Soft Soil based on Artificial Bee Colony

Rahul Khandelwal, J. Senthilnath, S. N. Omkar and Narendra Shivanath (2020). *Robotic Systems: Concepts, Methodologies, Tools, and Applications* (pp. 285-303).

[www.irma-international.org/chapter/a-novel-multiobjective-optimization-for-cement-stabilized-soft-soil-based-on-artificial-bee-colony/244010](http://www.irma-international.org/chapter/a-novel-multiobjective-optimization-for-cement-stabilized-soft-soil-based-on-artificial-bee-colony/244010)