Chapter 2
AI and Blockchain for Industrial Robotics:
Ethical, Legal, and Social Implications

Sanjana Prasad
HKBK College of Engineering, India

Deepashree RajendraPrasad
Boston University, USA

ABSTRACT

The fusion of artificial intelligence (AI) and blockchain technology holds the promise of a profound transformation in the realm of industrial robotics. This amalgamation has the potential to usher in a new era characterized by heightened automation, transparency, and trust within production and supply chain processes. Nevertheless, as is often the case with technological advancements of this magnitude, it is imperative to recognize and address several ethical, legal, and social concerns that accompany this paradigm shift.

1. INTRODUCTION

Robots are designed to perform repetitive tasks and relieve human workers from strenuous physical work. Industrial robots are developed for automating intensive production tasks which requires constantly moving assembly lines. Industrial robots in manufacturing are used for material handling, pick & place functions and inspection to assembly, packaging & palletizing and finishing applications. Advantages of Industrial Robots include increased efficiency, higher quality, improved working environment, increased profitability, longer working hours, and prestige. Limitations includes Capital cost, expertise, limitations in the tasks it can perform. Equipping robots with AI tools allow them to learn and make decisions autonomously and in real time through the use of algorithms and techniques that enable them to process information from sensors that connect them to their environment. Blockchain can help robotics to take a step further towards complete autonomy, where they can operate without much human intervention.

DOI: 10.4018/979-8-3693-0659-8.ch002

Roboethics analyses the ethical, legal and social aspects of robotics with respect to advanced robotics applications. Issues related to this include liability, protection of privacy, human dignity defence, dignity of work and distributive justice. Some of the social impacts of industrial robots include job displacement, changes in social norms and relationships, distribution of wealth and power, and mitigating the impact of robots on society. In this chapter, we will be discussing about the Role of AI and Blockchain technology in Industrial robotics and the ethical, legal and social implications when AI and Blockchain technology in Industrial robots. We will be discussing about how to overcome such challenges (Adithya et al.,2021).

Artificial Intelligence (AI) has empowered robots with the ability to learn from data, adaptability to changing environments, and making decisions, making them more versatile and efficient. In industrial settings, AI-driven robots enhance productivity, reduce errors, and contribute to safer work environments. Blockchain, on the other hand, provides a distributed and immutable ledger for data storage and transactions. It ensures data transparency, security, and traceability, making it invaluable for recording and verifying information in industrial robotics.

Robots can be equipped with machine vision and artificial intelligence systems that enable them to respond to a variety of situations and provide feedback on system performance in real-time. Some of the other functionalities done by robots includes Assembly & Dispensing, Handling & Picking, Machining & Cutting, Welding & Soldering, Casting & Moulding, Finishing & Sanding, Painting & Coating, Cleaning & Hygiene, Logistics & Storage, Packing & Palletizing, Inspection & Quality Control and Harvesting.

In the realm of industrial robotics, the convergence of artificial intelligence (AI) and blockchain technology has ushered a new era of automation and data management. These technologies, individually potent, join forces to revolutionize the way industries operate. While the potential benefits are remarkable, the ethical, legal, and social implications accompanying this synergy cannot be overlooked.

Industries currently employing Robots are Agriculture, Robot picking, Crop harvesting/wedding, Manufacturing, Damage control and quick maintenance, Automatic control, nuclear waste management, assembly line quality inspection, Smart home appliances, aerospace, Transportation and Healthcare. Figure 1 shows the picture of Industrial Robot.

Figure 1. Industrial robot [Telephonica]