The Smart Factory of Tomorrow: Artificial Intelligence and Machine Learning Reshaping Manufacturing Processes

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Abstract:
The smart factory of the future would not be possible without the development of AI and ML technologies, which have ushered in a new era of production. Traditional industrial processes are being revolutionized by AI and ML due to their capacity to evaluate large quantities of data and make autonomous choices, which is leading to greater efficiency, productivity, and profitability. Predictive maintenance is one area where AI and ML are making important contributions. These systems may prevent unexpected and expensive failures by constantly monitoring equipment performance and analyzing real-time data. Taking preventative measures like these results in less downtime, lower maintenance expenses, and more efficient machinery. Synergies between AI and ML are improving factory quality assurance. These technologies can identify even the smallest flaws or deviations from product standards using sophisticated vision systems and pattern recognition algorithms. Manufacturing companies may reduce waste and customer complaints by maintaining a constant quality standard via the use of automated inspection methods. Optimization of production planning and scheduling is another important use of AI and ML in manufacturing.

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Contents

I. Introduction

The advent of the intelligent factory of the future is having a profound effect on the industrial sector. The convergence of AI and ML technologies is transforming industrial processes and pushing the sector forward into uncharted territory by increasing efficiency, productivity, and creativity. Increased productivity and cost savings result from the ability of machines to learn, adapt, and execute jobs with higher precision and accuracy made possible by these technologies [1].

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