Construction Robotics: Revolutionizing the Building Industry

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Abstract

Construction robotics is transforming the building industry by introducing innovative technologies that enhance productivity, improve safety, and reduce project timelines. Traditional construction practices, often labor-intensive and time-consuming, face challenges such as labor shortages, cost overruns, and safety concerns. Robotics, including autonomous machines, drones, and 3D printing systems, address these issues by automating tasks like à¦å&\|æ^â} *Ê&[}&¦^c^Å][˘¦â}*ÊÅæ}åÅ{æc^¦âæ|Åc¦æ}•][¦cæcâ[}ÊÅV@^•^Åæàçæ}&^{^}c•Å}[cÅ[}|^Åâ{]¦[ç^Å^ &â^}&^Åà˘cÅ also ensure precision and quality in construction processes. Moreover, construction robotics supports sustainable]¦æ&cå&^•Åà^Å[]cå{â:â}*Å{æc^¦âæ|Å˘•æ*^Åæ}åÅ¦^â˘&äcå{â: Ð à^}^,c•Ê&@æ||^}*^•ÊÅæ}åÅ~˘c˘¦^Åc¦^}å•Åâ}&[}•c¦˘&câ[}Å¦[àcâ&•Ê the building industry.

The construction industry, historically reliant on manual labor and traditional methods, is undergoing a transformative shift driven by advancements in construction robotics. This revolution is reshaping how structures æ¦^Åå^•â*}^åÊÅà˘â|cÊÅæ}åÅ{æâ}cæâ}^åÊÅ[^¦â}*Å•[|¦câ[}•Åc[Å&@æ||^}*^•Å˘&@Åæ•Å|æà[¦Å•@[¦cæ*^•Ê•æ-^c^Å¦â•\•ÊÅæ}åÅ â}^&å^^}&å^•ÊÅÔ[}•c¦˘&cå[}Å¦[à[c•ÊÅ|à[c^Êåâ{æ}*â}*Å*Å^|åâ}*â¦[à[c^c}{{[˘•Å^Å^¢&æçæcâ[}Åæ}åÅ â}•]^&câ[}Ååâ¦[}•^Êåæ¦|â}*Å*Â-æ•c^¦ÊÅ{[¦^Å]¦^&â•^Åæ}åÅ[•cËˇ^&âç^Åâ|åâ}*Å*Å]¦[&^••••ÊÅÔ[˘]|^åÅ¸âc@Åâ]}çæcâ[}•Å â}}Å}Åæ¦câ,&âæ|Åâ}c^||â*^}&^ÅÇŒQDÊÅ{æ&@â}^Å|^æ¦}â}*ÅÇTŠDÊÅâ}ÅQ}c^¦}^cÅ[~ÅV@â}*•ÅÇQ[VDÅc^&@}[|[*â•^Ê&âc@^•^Å¦[à[c•Å^¦ â}Å

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Introduction

Construction robotics is at the forefront of the modern building industry, poised to transform how structures are designed, built, and maintained. As the construction sector faces challenges such as labor shortages, safety concerns, and increasing demands for e ciency and sustainability, robotics provides innovative solutions that drive progress [1]. is article explores the impact, applications, and future potential of construction robotics. e construction sector is one of the oldest and most essential industries, serving as the backbone of global infrastructure development. Despite its critical role, the industry faces persistent challenges, including high labor costs, skilled worker material waste and optimizing energy use [6]. Recent advancements in AI, ML, and IoT have further accelerated the integration of robotics into costs, resistance to change, and regulatory challenges. Addressing these barriers is crucial to unlocking the full potential of construction robotics [10].

is paper provides a comprehensive overview of the current state of construction robotics, highlighting their applications, bene ts, and challenges. By examining successful implementations and emerging trends, the discussion aims to shed light on how robotics is revolutionizing the construction industry and shaping its future.

Construction robots

Construction robots are specialized machines designed to automate tasks in building projects.   ese robots leverage advanced technologies such as arti cial intelligence (AI), machine learning, computer vision, and sophisticated sensors to perform repetitive, dangerous, or precision-demanding activities.

e primary goal of construction robotics is to enhance productivity, reduce costs, improve safety, and maintain consistent quality throughout a project.

Applications of construction robotics

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