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Robotics and Automated Systems in Construction

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Abstract: Construction robotics and automatic aims to revolutionize the construction industry by utilizing robotic system and advanced automation technologies to address labor shortages, improve safety, enhance productivity, and achieve higher quality standards by automating repetitive tasks, precise material handling, and complex construction processes, thereby transforming the traditional manual labor- intensive approach to building construction. A mixed research method was employed combining literature review, qualitative and quantitative data collection and analysis. Three focus groups with 28 experts and an online questionnaire were conducted. Principal component and correlation analyses were conducted to group the identified factors and find hidden correlations. The main identified challenges were grouped into four categories and ranked in order of importance: contractor-side economic factors, client-side economic factors, technical and work-culture factors, and weak business case factors. No strong correlation was found among factors. This study will help stakeholders to understand the main industry-specific factors limiting the adoption of robotics and automated systems in the construction industry. The presented findings will support stakeholders to devise mitigation strategies

Keywords: Automated construction, Robotics, Addictive manufacturing, Exoskeletons, Autonomus vehicles, Off-site construction, 3d printing, sensor networks, machine learning, construction simulation, site surveying drones, integrated system

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