World Academy of Science, Engineering and Technology
International Journal of Mechanical and Industrial Engineering
Vol:18, No:01, 2024

Design of Cartesian Robot for Electric Vehicle Wireless Charging Systems

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Abstract : In this study, a cartesian robot is developed to improve the performance and efficiency of wireless charging of electric vehicles. The cartesian robot has three axes, each of which moves linearly. Magnetic positioning is used to align the cartesian robot transmitter charging pad. There are two different wireless charging methods, static and dynamic, for charging electric vehicles. The current state of charge information (SOC State of Charge) and location information are received wirelessly from the electric vehicle. Based on this information, the power to be transmitted is determined, and the transmitter and receiver charging pads are aligned for maximum efficiency. With this study, a fully automated cartesian robot structure will be used to charge electric vehicles with the highest possible efficiency. With the wireless communication established between the electric vehicle and the charging station, the charging status will be monitored in real-time. The cartesian robot developed in this study is a fully automatic system that can be easily used in static wireless charging systems with vehicle-machine communication.

Keywords : electric vehicle, wireless charging systems, energy efficiency, cartesian robot, location detection, trajectory planning
Conference Title : ICAME 2024 : International Conference on Automotive and Mechanical Engineering
Conference Location : Istanbul, Türkiye
Conference Dates : January 29-30, 2024