

# Artificial Intelligence-Assisted Design and Fault Diagnosis of Electric Motors for Green Transportation

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The impact of artificial intelligence (AI) is rapidly growing and increasingly pivotal across a wide range of disciplines, from innovative scientific research to practical, everyday applications. The powerful capabilities of AI—spanning data analysis, predictive modeling, and beyond—equip researchers and professionals with unparalleled tools to tackle complex problems, push the boundaries of scientific discovery, and elevate productivity to unprecedented levels. This talk will explore the integration of AI in diagnosing motor faults and advancing motor design, highlighting how AI can significantly enhance the reliability and performance of electric motors in green transportation. It will delve into the use of machine learning and deep learning models to predict and prevent motor failures (e.g., inter-turn short-circuits, demagnetization, and bearing faults) [1], [2], [3], which is essential for ensuring safety and reliability in transportation and industry. Furthermore, the talk will highlight AI-driven innovations in motor design [4], such as noise-reduction, offering insights into how AI can revolutionize traditional motor systems and contribute to ongoing improvements in predictive maintenance and design practices.

**Keywords:** Permanent magnet synchronous machine; inter-turn short circuit; demagnetization; fault diagnosis; field-orient control

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## References

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