IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 9, March 2025
Impact Factor: 7.67

Advanced BLDC Motor Control Techniques using Artificial Intelligence

Ms. Pratiksha N. Bhagat[1] and Dr. Umesh E. Hiwase[2]
PG Students, Department of Electrical Engineering[1]
Assistant Professor, Department of Electrical Engineering[2]
Priyadarshini College of Engineering, Nagpur, India

Abstract: *This paper presents a comprehensive review and analysis of artificial intelligence (AI) based control techniques for Brushless DC (BLDC) motors. We investigate the application of machine learning algorithms, neural networks, and fuzzy logic systems to enhance the performance, efficiency, and reliability of BLDC motor control systems. Experimental results demonstrate that AI-based controllers can achieve superior performance compared to conventional control methods, particularly in handling non-linearities, parameter variations, and disturbance rejection. The proposed hybrid approach combining model predictive control with reinforcement learning shows a 15% improvement in energy efficiency and a 22% reduction in torque ripple compared to traditional PI controllers.*

Keywords: BLDC motor, artificial intelligence, machine learning, neural networks, fuzzy logic, model predictive control, reinforcement learning

DOI: 10.48175/IJARSCT-24646