

## Finite Element Method Analysis of a Modified Rotor 6/4 Switched Reluctance Motor's and Comparison with Brushless Direct Current Motor in Pan-Tilt Applications

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**Abstract :** In this study, the use of a modified rotor 6/4 Switched Reluctance Motor (SRM) and a Brushless Direct Current Motor (BLDC) in pan-tilt systems is compared. Pan-tilt systems are critical mechanisms that enable the precise orientation of cameras and sensors, and their performance largely depends on the characteristics of the motors used. The aim of the study is to determine how the performance of the SRM can be improved through rotor modifications and how these improvements can compete with BLDC motors. Using Finite Element Method (FEM) analyses, the design characteristics and magnetic performance of the 6/4 Switched Reluctance Motor are examined in detail. The modified SRM is found to offer increased torque capacity and efficiency while standing out with its simple construction and robustness. FEM analysis results of SRM indicate that considering its cost-effectiveness and performance improvements achieved through modifications, the SRM is a strong alternative for certain pan-tilt applications. This study aims to provide engineers and researchers with a performance comparison of the modified rotor 6/4 SRM and BLDC motors in pan-tilt systems, helping them make more informed and effective motor selections.

**Keywords :** reluctance machines, switched reluctance machines, pan-tilt application, comparison, FEM analysis

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