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Intelligent Control of BLDC Motor

Thesis submitted in partial fulfillment of the curriculum prescribed for the award of the degree of Bachelor of Engineering in Electrical and Electronics Engineering by

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Abstract

The one major difference and advantage of BLDC from regular D.C. motor is the absence of commutator brushes in BLDC thus enhances BLDC to have almost ideal torque-current characteristics for various applications and can reach up to speed of 60,000 rpm. Another major advantage of BLDC motor is, it consumes relatively low power compared to regular DC motor for a given speed. In this project, we are going to build a speed control and management driver circuit for BLDC motor. In a DC motor the stator has a permanent magnet. The rotor has the windings, which are excited with a current. The current in the rotor is reversed to create a rotating or moving electric field by means of a split commutator and brushes. On the other hand, in a BLDC motor the windings are on the stator and the rotor is a permanent magnet. To make the rotor turn, there must be a rotating electric field. Typically a three-phase BLDC motor has three stator phases that are excited two at a time to create a rotating electric field. This method is fairly easy to implement, but to prevent the permanent magnet rotor from getting locked with the stator, the excitation on the stator must be sequenced in a specific manner while knowing the exact position of the rotor magnets. Position information can be obtained by either a shaft encoder or, more often, by Hall effect sensors that detect the rotor magnet position.