Improved Brushless DC Motor

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Two simple models were built and tested with two electromagnet coils and two Hall Effect switches working in a double push and a push and pull operation. These models were used to test different circuit ideas. They shared a unified mechanical design for easier comparison between them. However, they could not be compared to industrial motors, so two new motors were created using the rotor and the stator of one of the most efficient brushless industrial motors, where the circuitry was replaced with new designs. These new motors were compared to the original. A motor with two Hall Effect switches worked slightly better than the industrial motor, but only in a narrow voltage range. A second motor with a simple circuit utilizing a single pole double throw reed switch as a sensor, instead of the many electronic parts of the industrial motor, outperformed it significantly, being faster and more efficient at any voltage. This new simple brushless DC motor demonstrated at least a 20% increase in efficiency at any speed compared to one of the best industrial motors.

Awards Won: