World Academy of Science, Engineering and Technology
International Journal of Energy and Power Engineering
Vol:9, No:06, 2015

Efficient Control of Brushless DC Motors with Pulse Width Modulation

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Abstract : This paper describes the pulse width modulated control of a three phase, 4 polar DC brushless motor. To implement this practically the Atmel's AVR ATmega 328 microcontroller embedded on an Arduino Eleven board is utilized. The microcontroller programming is done in an open source Arduino IDE development environment. The programming logic effectively manipulated a six MOSFET bridge which was used to energize the stator windings as per control requirements. The results obtained showed accurate, precise and efficient pulse width modulated operation. Another advantage offered by this pulse width modulated control was the efficient speed control of the motor. By varying the time intervals between successive commutations, faster energizing of the stator windings was possible thereby leading to quicker rotor alignment with these energized phases and faster revolutions.

Keywords : brushless DC motors, commutation, MOSFET, PWM
Conference Title : ICPESE 2015 : International Conference on Power and Energy Systems Engineering
Conference Location : London, United Kingdom
Conference Dates : June 28-29, 2015