

OPTIMAL BLDC MOTOR CONTROL SYSTEM TRAINER DEVELOPMENT USING A LINEAR QUADRATIC REGULATOR BASED STM32F4 DISCOVERY

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ABSTRACT

Brushless DC electric motors, also known as BLDC motors, are most widely applied in industry and our environments, such as robotics, electric bicycles, and various other electric vehicles. Because without using a brush motor, this device is very efficient and has high precision because there are no sparks on the rotor and stator parts. This study aims to design a BLDC motor trainer with adaptive control system learning.

This research method uses technological development steps, such as Research and Development (R&D). The location of research was carried out in the Industrial Electronics Engineering Laboratory, Department of Electronics and Informatics Engineering Education, FT, UNY. The research period starts from March to October 2022. The expected research results are a set of BLDC motor trainers with industry standards and practicum lab sheets. The trainer was constructed using the Open407-D development board and the STM32 Discovery.

The results of the study show that the learning trainer has decent performance for learning in terms of control system engineering and programming. By mastering the material in the engineering field, the trainer that has been prepared can be used as a medium for learning different control algorithms.

Keywords: Learning Trainer, Brushless DC electric motor, Linear Quadratic Regulator, STM32 discovery.

Kata Kunci: *Learning Trainer, Brushless DC electric motor, Linear Quadratic Regulator, STM32 discovery.*