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Evolutionary Computation for Optimization
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Abstract

This research presents two mathematical –based optimal control systems for induction motor drives leading to stator current optimization and energy saving. The first is a classical optimal control system, which uses information on torque of the motor to generate the appropriate voltage amplitude that minimizes the induction motor stator current. The second is a genetic algorithm-based optimal control system, which uses information on torque of the motor to generate the appropriate minimum stator current according to fitness function. The constant optimal stator current controller models have been configured and built depending on a set of experimental data using MATLAB computer program, the models were validated by simulation using a typical induction motor drive model implemented with MATLAB/Simulink toolbox.

The aim of this research is the industrial machineries performance improvement by analyzing and designing the induction motor optimal stator current controller, this will minimize the stator current under different loading conditions. Depending on the motor shaft mechanical load torque in order to minimize the stator current, the controller will supply stator of motor with proper voltage and frequency using appropriate control algorithm for industrial machinery.

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