

# **Abstract**

**Mohamed I Abu El-Sebah**

## **PI controller based on genetic algorithm for PMSM drive system**

This paper introduces a genetic-algorithm-based PI controller for position control of permanent magnet synchronous motor. The algorithm is proposed for optimizing the PI controller gains in the position control. Different controllers' strategies are applied for the cascaded-loop position controller, speed controller and current controllers. The controllers are compared together to Select the best one. The objective target, which has been used for comparison, is the rise time, settling time, steady state error. In addition, the response of the developed torque is investigated. Simulation results show that using genetic-algorithm-based PI controller gives the best performance.