

**ARTIFICIAL IMMUNE SYSTEM OPTIMIZATION TECHNIQUE
FOR OPTIMAL LOCATION AND PARAMETER SETTING
OF UPFC**

**This thesis is presented in partial fulfillment for the award of the
Bachelor of Electrical Engineering (Hons)**

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ABSTRACT

This project report is about to find optimal location for parameter setting of Unified Power Flow Controller (UPFC) at line data in transmission line from the bus system by using Artificial Immune System (AIS) Programming technique. The Unified Power Flow Controller is present by controlling the value of impedance at three line data to determine the best optimal location that have the minimum losses and costs for the system. A reliable method was present to meet the requirements by developing a Newton-Raphson based load flow calculation program through which control setting of UPFC can be determined directly. A MATLAB program has been developed to calculate the control setting parameters of the UPFC after the load flow is converged. Case studies have been tested using the IEEE 26 buses Reliability Test System. The objective functions implemented are minimizing the loss, minimizing the costs of generation and get the minimum voltage improvement to be achieved. Comparison was made in order to determine the best objective function to be used for solving this problem.

Keywords:

Unified Power Flow Controller (UPFC), Artificial Immune System (AIS), Flexible AC Transmission System (FACTS).

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