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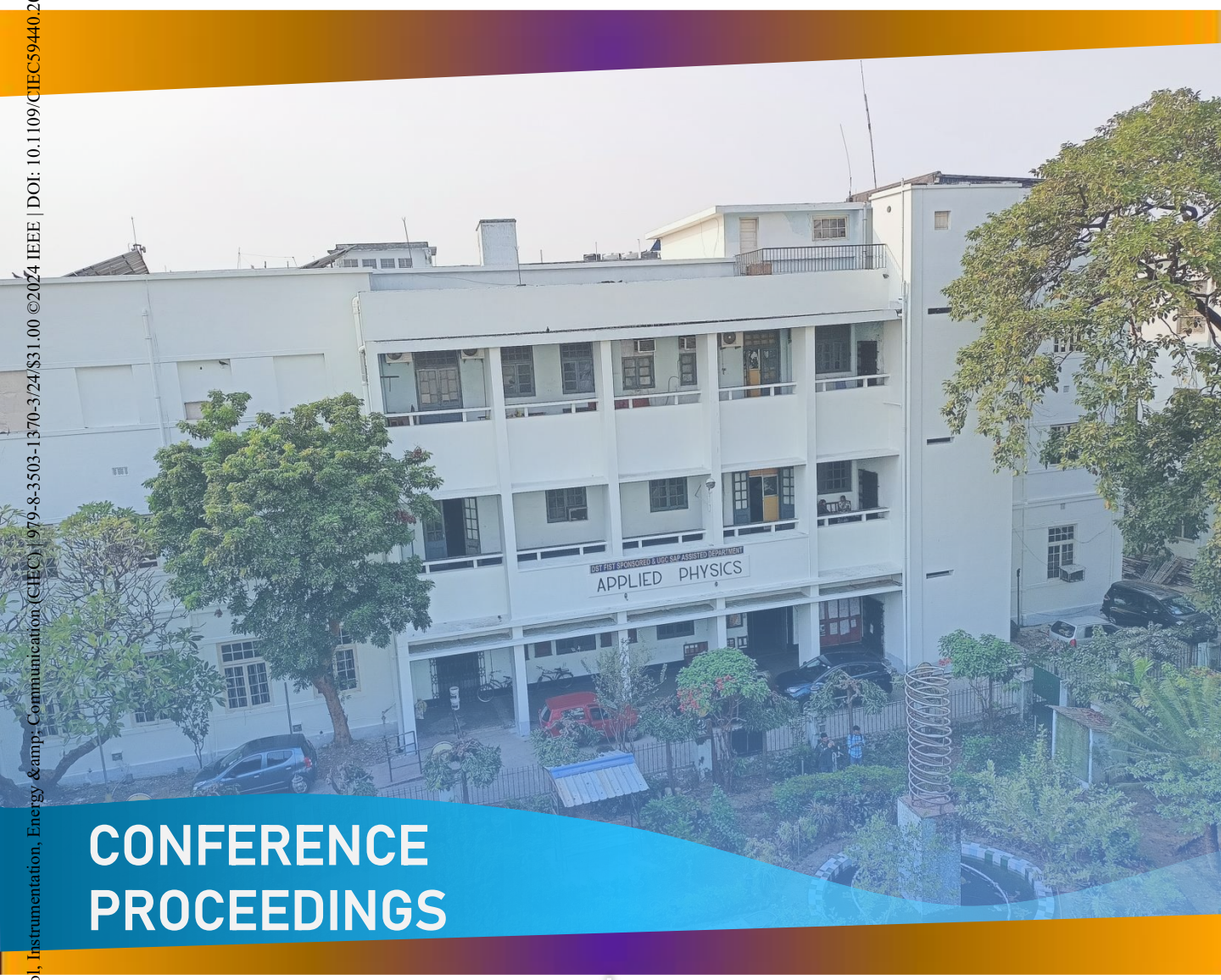

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Table of Contents

Enhanced Fitness Adaptive Differential Evolution Approach for Tuning of PID Controller in AVR System

Publisher: IEEE

Mou Das Mahapatra ; Shibendu Mahata ; Biman Kumar Saha Roy **All Authors**

Abstract:
To upgrade the dynamic performance of the Automatic Voltage Regulator (AVR), several control strategies have been implemented by control engineers. The Proportional-Integ... **View more**

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Abstract:
To upgrade the dynamic performance of the Automatic Voltage Regulator (AVR), several control strategies have been implemented by control engineers. The Proportional-Integral-Derivative (PID) controller is the most widely used among all the controllers that have been reported. In order to enhance the AVR system's dynamic performance, this work addresses the design of a PID controller utilizing a unique optimization technique known as the Enhanced Fitness Adaptive Differential Evolution Algorithm (EFADE). The EFADE algorithm demonstrates an excellent robustness in calculating the PID controller parameters. Time domain response and frequency domain response specifications are evaluated to validate the efficacy of the designed controller. Results reveal an improved dynamic response along with superior load disturbance rejection performance for the proposed EFADE-PID controller as compared to the recently published literature.

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Mou Das Mahapatra
Dept. of Electrical Engineering, NIT Durgapur & Dr. B. C. Roy Engineering College, Durgapur, India

Shibendu Mahata
Dept. of Electrical Engineering, Dr. B. C. Roy Engineering College, Durgapur, India

Biman Kumar Saha Roy
Dept. of Electrical Engineering, NIT Durgapur, Durgapur, India

Contents

Day-by-day, electrical networks continue to commission new sub-stations to support the rapid increase in various load demands. Large number of generators from different power plants are connected to the grid to continuously supply different type of loads. Synchronous generators suffer from stability problem with load variations and cause deviations in both voltage and working frequency. Although, the load and the power factor are continuously varying, however, from the electrical consumers' point of view, the terminal voltage always needs to be constant. Thus, to preserve the consistency in the generator terminal voltage, the automatic voltage regulator (AVR) is utilized [1].

Authors

Mou Das Mahapatra
Dept. of Electrical Engineering, NIT Durgapur & Dr. B. C. Roy Engineering College, Durgapur, India

Shibendu Mahata
Dept. of Electrical Engineering, Dr. B. C. Roy Engineering College, Durgapur, India

Biman Kumar Saha Roy
Dept. of Electrical Engineering, NIT Durgapur, Durgapur, India