

**FUZZY LOGIC BASED POWER SYSTEM STABILIZER  
FOR CONTROLLING GENERATOR SPEED USING  
DELPHI**

**Project report is presented in partial fulfillment for the award of the  
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## **ABSTRACT**

This project describes the developed software based on fuzzy logic to control the speed of synchronous generator. The software is applied to synchronous generator as the controller input variable. This fuzzy system is designed not only for generator but also can apply to other machines by setting the fuzzy logic parameter of the program. This program is limited to function with 5 membership functions. Delphi 5 is used to develop this program.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Conventional power system stabilizer (PSS) is designed based on linear control theory. The power system model is linearised around a nominal operating point, and the structure and the parameters of the PSS are determined to provide optimal performance at this point. Power systems are in general nonlinear and the operating conditions can vary over a wide range. Thus, the fixed parameters conventional PSS cannot provide optimal performance over the whole operating range. Power system configuration also changes with time and parameters of the PSS must be returned so that it can continue to provide the desired performance.

Unlike the classical approach, which requires a deep understanding of a system, exact equations and precise numeric values, fuzzy logic incorporates an alternative way of thinking which allows one model complex systems using a higher level of abstraction originated from accumulated knowledge and experience. Fuzzy logic allows one to express the knowledge with subjective concepts such as very tall, too small, moderate and slightly deviated, which are mapped on to numeric ranges.

A fuzzy logic controller (FLC) uses fuzzy logic as a design methodology, which can be applied in developing linear and nonlinear systems for embedded control. Recently, FLCs have been gaining increasing acceptance. FLC techniques have been found to be a good replacement for conventional control technique, which requires highly complicated mathematical models. Fuzzy logic simplicity enables the control in less development time, at lower development cost and with better performance.