

SPATIAL LOAD FORECASTING USING FUZZY LOGIC TECHNOLOGY

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ABSTRACT

This report describes the Fuzzy logic technology to fuse the available information for spatial load forecasting. The developed program is performed by Fuzzy Tech Version 5.12. Different approach in spatial load forecasting based on land usage load modeling has been used to improve the performance of distribution load forecasting. Fuzzy Logic is applied in this forecast to aggregate appropriate geographic information to formulate future load growth based on different anticipated scenarios. For the purpose of this project, the Mamdani type of fuzzy controller was used. The assessment of the program has been obtained after making a comparison of the target load. The performance of the developed is also discussed in this report. The proposed scheme can provide distribution planners other alternatives to aggregate their information for spatial load forecasting.

TABLE OF CONTENTS

CHAPTER	DESCRIPTION	PAGE
	DECLARATION	i
	ACKNOWLEDGEMENT	ii
	ABSTRACT	iii
	TABLE OF CONTENTS	iv
	LIST OF FIGURES	vii
	LIST OF TABLES	ix
	LIST OF ABBREVIATIONS	x
1	INTRODUCTION	
	1.1 Introduction	1
	1.2 Conventional Technique for Load Forecasting	4
	1.3 Modern Techniques for Load Forecasting	5
	1.4 Objective	7
	1.5 Scope of Works	7
	1.6 Organizational of Project Report	7
2	LITERATURE ON SPATIAL LOAD FORECASTING	
	2.1 Introduction	9
	2.2 Short Term Load Forecasting	10

CHAPTER 1

INTRODUCTION

1.1 Introduction

Spatial Load Forecast (SLF) predicts where, when and how much load growth will occur in a utility service area. This information is traditionally used for expansion planning purposes to ensure that the system will be able to supply the load. The foundation of SLF methods is well documented by Willis [1], who was the promoter of this kind of technique. However, to improve the functionality and the framework of SLF, there is a need for research in the methods and techniques used in a diversity of forecasting areas. The aspects related to the spatial resolution, load growth behavior, geographic influence factors that affect the development and the general structure of SLF models must be considered under a systematic approach, rather than heuristic or case-base approach.

It must be stressed that distribution planning aims to design good solutions to supply power to consumers. Since the load forecasting and its uncertainty are the basis for all distribution planning, the SLF models require higher attention on distribution planning methodologies.

Forecasting the electric consumption growth is related with other researches such as areas as urban planning, social sciences and forecasting science. On urban planning, a large works have been done and some of the works are the basis of the spatial load forecasting methodologies. Most of the researches in this area are being developed using Geographic Information System (GIS) as the implementation tool. However, new methodologies and techniques (Neural Networks, Cellular Automata and Fuzzy Systems) are also being used to simulate the growth behavior.