

SELF ORGANIZING NETS FOR
PATTERN RECOGNITION
(UNSUPERVISED LEARNING BASED ON DISCOVERY
OF CLUSTER STRUCTURE)

A PROJECT REPORT PRESENTED IN PARTIAL FULL FILLMENT OF
REQUIREMENTS FOR THE AWARD OF ADVANCE DIPLOMA IN
ELECTRICAL (ELECTRONICS) ENGINEERING OF
MARA INSTITUTE OF TECHNOLOGY

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MAY 1992

ACKNOWLEDGEMENT

One of the most pleasant parts in making this project is the opportunity to thank those who have contributed to it. Unfortunately, the list of expressions of thanks - no matter how extensive - is always incomplete and inadequate. These acknowledgements are no exception.

The contributions of some, however, are so great that they must be mentioned. Special thanks to our parents who have given their moral support and encouragement to complete this project.

We are greatly indebted to Encik Zulkifli Bin Abdul Majid, our project adviser for his support and invaluable assistance in the form of reviews and offering a number of suggestions on the project. His concern, guidance and advise has given us the chance to prove our ability to complete this project successfully.

ABSTRACT

The purpose of this project is to develop an organizing discipline by which neural network system can be designed for specific computations. Furthermore, it is also to recognize and make use of both the similarities and differences between well-established procedures and the newly proposed neural network approaches.

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CHAPTER 1

INTRODUCTION

Artificial neural network models have been studied for many years in the hope of achieving human like performance in the field of speech and image recognition. These models are composed of many nonlinear computational element operating in parallel and arranged in patterns reminiscent of biological neural nets.

Computational elements or nodes are connected via weights that are typically adapted during use to improve performance. Neural net models are specified by the net topology, node characteristics, and training or learning rules. These rules specify an initial set of weights and indicate how weights should be adapted during use to improve performance. Most neural net algorithms also adapt connection weights in time to improve performance based on current results. Adaptation or learning is a major focus of neural net research. Adaptation also provides a degree of robustness by compensating for minor variabilities in characteristics of processing elements. There has been a recent resurgence in the field of artificial neural nets caused by new net topologies and