

**THE DEVELOPMENT OF AN AUTOMATED PATTERN
RECOGNITION BASED ON NEURAL NETWORK**



**INSTITUT PENYELIDIKAN, PEMBANGUNAN DAN
PENGKOMERSILAN
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM, SELANGOR
MALAYSIA**

BY :

**IRNI HAMIZA HAMZAH
MOHAMMAD NIZAM IBRAHIM
LINDA MOHD KASIM**

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Surat Kami : 600-IRDC/ST 5/3/822
 Tarikh : 1 September 2004

Pengarah
 UiTM Cawangan Pulau Pinang
 Kampus Bukit Mertajam
 Permatang Pasir
 13500 Permatang Pauh
 Pulau Pinang

Tuan/ Puan

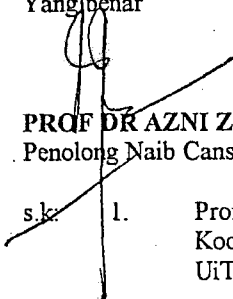
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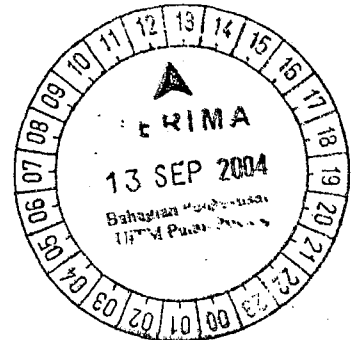
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Sekian, terima kasih.

Yang benar


PROF DR AZNI ZAIN AHMED
 Penolong Naib Canselor (Penyelidikan)

- s.k.
1. Prof. Madya Peridah Bahari
 Koordinator URDC
 UiTM Cawangan Pulau Pinang
 2. Puan Irni Hamiza Hamzah
 Ketua Projek
 UiTM Cawangan Pulau Pinang
 3. Encik Mohd Halil Marsuki
 Penolong Akauntan
 Unit Kewangan Zon 17
 (Sila hantarkan geran penyelidikan bagi projek ini ke Kampus Cawangan)



ezy

PENYELIDIKAN, PEMBANGUNAN DAN PENGKOMERSILAN LANDASAN KEWIBAWAAN DAN KECEMERLANGAN

No. Telefon :					
Penolong Naib Canselor (Penyelidikan)	: 03-55442094/5	Ketua Perundingan	: 03-55442100	Pejabat Am	: 03-55442093
Ketua Penyelidikan (Sains Sosial dan Pengurusan)	: 03-55442097	Ketua Pengkomersilan	: 03-55442750		: 03-55442101
Ketua Penyelidikan (Sains Sosial dan Teknologi)	: 03-55442091	Ketua Harta Intelek	: 03-55442753	Fax	: 03-55442096
Ketua INFOREC	: 03-55442750	Penolong Pendaftar	: 03-55442092	Unit Kewangan Zon 17	: 03-55443440
Ketua Perundingan (Kewangan)	: 03-55442090	Pegawai Eksekutif	: 03-55442098	Penolong Akauntan	: 03-55442099



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ABSTRACT

Pattern recognition techniques are used to automatically classify a variety of physical objects or abstract patterns. The capability of powerful personal computers and affordable and high resolution sensors (i.e.: CCD cameras, microphones and scanners) have fostered the development of pattern recognition algorithms in new application domains (i.e.: fuzzy logic, neural network and genetic algorithm). Based on this idea, the objective of this project is to develop an automated pattern recognition system based on neural network to recognize the pattern of loaded data file. MATLAB Version 7.0.4 Release 14 has been used as a programming language to build the system. The performance of single neural network with two different types of architectures (i.e.: neural network with single output and multiple outputs) have been evaluated and compared. Two types of data (i.e.: iris data and cervical cancer data) have been used to test the performance of the proposed system. The selected neural network architecture is the Multilayer Perceptron (MLP) network, which is trained with three different types of learning algorithms, namely the Levenberg Marquardt (LM), Bayesian Regression (BR) and Gradient Descent (GDX). The results obtained showed that, for both iris and cervical cancer data, the MLP network trained using LM for single output produced the highest overall accuracy of 100% with the least value of hidden neurons and epochs. In conclusion, the MLP network trained using LM for single output produced the best performance compared to BR and GDX. This project has developed a user-friendly pattern recognition system by using MATLAB GUI. The system is capable of accepting any type of loaded data file

and input parameters chosen by the user. The system also provides a user-friendly attributes to be used by unfamiliar MATLAB programming language user.