

**AN APPLICATION OF PREDICTIVE MODEL IN DETECTING  
CHRONIC KIDNEY FAILURE AND DISEASE  
USING FUZZY LOGIC**

**NUR IDRINA BINTI ZAKARIA  
AIN NAZIRAH BINTI MOHD ADNAN**

**Thesis Submitted in Fulfillment of the Requirement for  
Bachelor of Science (Hons.) Computational Mathematics in the  
Faculty of Computer and Mathematical Sciences  
Universiti Teknologi MARA**

**July 2019**

## DECLARATION BY CANDIDATE

We certify that this report and the research to which it refers is the product of our own work and that any idea or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.



.....  
NUR IDRINA BINTI ZAKARIA

2016289548



.....  
AIN NAZIRAH BINTI MOHD ADNAN

2016299186

DATE: 11 JULY 2019

## ABSTRACT

The 24<sup>th</sup> report of the Malaysian Dialysis and Transplant register for 2016 states that Malaysia has seen 100% increment in the number of new dialysis patients that suffer from chronic kidney disease (CKD) over the past 10 years. Therefore, this research aimed to predict the CKD using fuzzy logic toolbox. The data were collected from seventy clinical test patients based on blood urea nitrogen, eGFR (estimated glomerular filtration rate) and serum creatinine test. The fuzzification of these data was generated using fuzzy toolbox in MATLAB software. As a conclusion, early detection of CKD is very important. The result showed the status of CKD for each patient whether a “Yes” or “No”. As a conclusion, early detection of CKD is very important to help patients to be treated at an early stage with the follow-up treatment and consultation with the nephrologist.

# TABLE OF CONTENT

	Page
DECLARATION BY THE SUPERVISOR	i
DECLARATION BY CANDIDATE	ii
ABSTRACT	iii
ACKNOWLEDGEMENT	iv
TABLE OF CONTENT	v
LIST OF TABLE	vii
LIST OF FIGURE	ix
<b>CHAPTER 1 : INTRODUCTION OF RESEARCH</b>	
1.1 Introduction	1
1.2 Background of Research	1
1.3 Problem Statement	3
1.4 Objective	4
1.5 Significance of Research	5
1.6 Scope of Study	5
1.7 Definition of Terms and Concept	6
1.8 Literature Review	8
1.9 Organization of Research	11
<b>CHAPTER 2 : METHODOLOGY</b>	
2.1 Introduction	12
2.2 Fundamental of Research	12

2.3 Research Step	17
2.4 Conclusion	22
<b>CHAPTER 3 : IMPLEMENTATION OF THE RESEARCH</b>	
3.1 Introduction	23
3.2 Research Data	23
3.3 Tabulated Data	24
3.4 Implementation	32
3.5 Conclusion	38
<b>CHAPTER 4 : RESULT AND DISCUSSION</b>	
4.1 Introduction	39
4.2 Result of Prediction of CKD	39
4.3 Discussion of Research	43
4.4 Conclusion	48
<b>CHAPTER 5 : CONCLUSION AND RECOMMENDATIONS</b>	
5.1 Introduction	49
5.2 Conclusion	49
5.3 Recommendation	51
<b>REFERENCES</b>	<b>52</b>