

**COMPUTER AIDED GEOMETRIC DESIGN (CAGD):  
COMPARISON STUDY BETWEEN CUBIC B-SPLINE, CUBIC  
TRIGONOMETRIC SPLINE AND CUBIC TRIGONOMETRIC  
BEZIER ON CHINESE CALLIGRAPHIC**

**NUR NABILAH BINTI CHE DRAMAN**

**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 2018**

## DECLARATION

I admitted that this project is my own product that any idea or quotation of other people, published or otherwise are fully acknowledged in accordance with standard referring practices of the discipline



.....  
NUR NABILAH BINTI CHE DRAMAN

2015430708

JUNE 6,2018

## **ABSTRACT**

Chinese calligraphic is the type of writing that can be expressed the feeling by handwriting and its very prized among China's cultured. Calligraphic are very particular about its shape, smooth line and continuity to produce the perfect curve. The method that have been used in this research are Cubic Trigonometric Bezier, Cubic Trigonometric Spline and Cubic Spline which is determined the best curve in generating the Chinese Calligraphic. However, in this research the method that give a smoothness curve is Cubic Trigonometric Bezier. This best result obtained by comparing with real figure and smoothness of the curve.

## TABLE OF CONTENTS

SUPERVISOR'S APPROVAL	I
DECLARATION	II
ABSTRACT	III
ACKNOWLEDGEMENTS	IV
TABLE OF CONTENTS	V
LIST OF TABLE	VIII
LIST OF FIGURE	X
CHAPTER 1	1
1.1 Introduction	1
1.2 Background of study	1
1.3 Problem Statement	3
1.4 Objectives	4
1.5 Significance of The Project	4
1.6 Scope of the Project	5
1.7 Project Benefits	6
1.8 Organization of The Project	6
CHAPTER 2	8
2.1 Introduction	8
2.2 Definition of term and concept	8
2.3 Literature Review	9
2.4 Methodology	12
2.4.1 B-Spline Method	12

2.4.1.1	Open uniform Cubic B-Spline	16
2.4.1.2	Basis function	16
2.4.2	Cubic Trigonometric B-Spline	19
2.4.2.1	Basis Function	19
2.4.2.2	Properties	23
2.4.3	Bezier Curve	24
2.4.3.1	Cubic Trigonometric Bezier	25
2.4.3.2	Basis functions	25
2.4.3.3	Properties	27
2.5	Research step	28
CHAPTER 3		31
3.1	Introduction	31
3.2	Research Data	31
3.3	Cubic B-Spline	33
3.3.1	Manipulated control polygon	38
3.4	Cubic Trigonometric Spline	42
3.4.1	Manipulated control points	42
3.4.2	Manipulated Shape parameter	44
3.4.2.2	Manipulated Shape parameter through globally	44
3.4.2.3	Manipulated Shape parameter through locally	47
3.5	Cubic Trigonometric Bezier	50
3.5.1	Manipulated control points	50
3.5.2	Manipulated Shape parameter	53
3.5.2.1	Manipulated Shape parameter through globally	53