# Universiti Teknologi MARA

# Figure Animation Via Bone Method

Mas Ayu Husna Binti Mohamad

Thesis submitted in fulfilment of the requirements for the Bachelor of Computer Science (Hons) (Multimedia Computing)
Faculty of Computer and Mathematical Sciences

January 2012

### **ACKNOWLEDGEMENT**

"By the name of Allah, Most Gracious, Most Merciful"

Alhamdulillah and I were grateful to Allah S.W.T for blessing me in order to complete my proposal report within the available period. Without the help and supporting of important people, I would not write my acknowledgement to show how much I was thankful to them.

First of all, special thanks to my supervisor, Mr. Fakhrul Hazman Bin Yusoff for your guide and give utmost support in order to complete this research. Without his ideas and opinions, I may not be able to carry out this research. Therefore, all her kindness for helping me in many ways during this research will not be forgotten.

My appreciation also goes to supportive lecturers, Mr. Mohd Yunus Mohd Yusof and Madam Suzana Baharudin for all the knowledge, guidance and opinions. Besides that, special appreciation to my family for their patience and supportive words that give me the strength to carry out this research. Thank you for understanding all my needs.

Last but not least, I would like to give my gratitude to my fellow classmates. Thank you for all your supports, cooperation and motivations. I appreciated it and had given the best effort I can in completing my research. May Allah bless all of you.

# TABLE OF CONTENTS

Declaration .					111
Approval					iv
Acknowledg	gement				v
Abstract					xi
Chapter 1	Introduction				
_	1.1 Background				1
	1.2 Problem Statemen	ıt			3
	1.3 Aim				3
	1.4 Objective				3
	1.5 Scope	of	S	Study	
	1.6 Significance	of	the	project	4
Chapter 2	Literature Review				
	2.1 Introduction				5
	2.2 Skeletal Animatio	n			5
	2.2.1 Definition	of	Skeletal	Animation	5
				cter	0
	2.2.3 Interactive S		•		
					7
	2.2.4 3D Characte	-			
					8
	2.2.5 Modelling at			_	0
	Anatomically	y-Based Approa	cn		8
	2.5.6 Fourier Prince	ciples for Emoti	on-Based Humar	1	

	Figure Animation	9			
	2.3 The Techniques				
	2.3.1 Rigging and Skinning Techniques.				
	2.3.2 Physics and Based Skin Deformations for				
	Character Animation	11			
	2.3.3 Sketching-Based Skeleton Generation				
	2.4 The Other Techniques of Animation	13			
Chapter 3	Methodology				
	3.1 Introduction	14			
	3.2 Research Framework				
	3.3 Research Model				
	3.4 Research Overview	18			
	3.4.1 Modelling Character	18			
	3.4.2 Bone Structure	18			
	3.4.3 Animating 3D Model	19			
	3.4.4 Rendering Process	20			
	3.5 Conclusion	20			
Chapter 4	Design and Development				
	4.1 Introduction	21			
	4.2 Design Character Model	21			
	4.3 Design Bone Structure	22			
	A.A. Animating 3D Character Model	23			

## **ABSTRACT**

This research paper present about method for animated the character animation. Character animation brings a static model to life by defining how its geometry changes over time. Character animation is quite different from other forms of animation (even facial animation) because of the underlying skeletal structure - motions are characterized more by rotations than by linear motion. Animators typically animate the bones of a character, either directly, or indirectly using inverse kinematics. The skin follows the bones, deforming as necessary to produce smooth transitions at joints. There are many ways to animate characters, including skeletal (bone-driven) animation, shape interpolation, spatial deformation, physically-based deformation and direct animation of vertices or spline-control points. Animation of any kind also introduces new challenges when combined with other areas of computer graphics, particularly areas that have traditionally considered only static scenes. Bone based animation is a good way to add believable animation to your engine without the overhead of vertex animation (morph targets).

Keywords: Character animation, Bone based animation, skeletal structure and inverse kinematics.