COMPARISON BETWEEN CUBIC TRIGONOMETRIC B-SPLINE AND CUBIC TRIGONOMETRIC NU-SPLINE ON 'WAU BULAN' DESIGN

RABIYYATUL ADAWWIYAH BINTI MOHAMED ABD AZIZ

Thesis submitted in fulfilment of the requirement for
Bachelor of Science (Hons.) Mathematical Modelling and Analytics
College of Computing, Informatics and Mathematics
Universiti Teknologi Mara

August 2023

ABSTRACT

The Wau Bulan, a traditional Malaysian kite, is known for its intricate and captivating design. In this study, comparison between two spline techniques, which are Cubic Trigonometric B-spline and Cubic Trigonometric Nu-spline, in the context of designing the Wau Bulan pattern in a 2-dimensional shape. Theoretical foundations and mathematical formulations of both spline methods are presented, emphasizing their applicability in representing smooth and visually. The results of this study reveal the strengths and limitations of each spline technique in capturing the unique features of the Wau Bulan design. The Cubic Trigonometric B-spline demonstrates excellent control and flexibility, allowing designers to precisely manipulate the curves and maintain the essence of the pattern. While Cubic Trigonometric Nu-spline show the smoothness and the ability to accurately capture the characteristics inherent in the Wau Bulan design. This study compares two methods to find the best method for the designer use it in the future. This study explores the impact of different control point and shape parameter, on the qualities of producing the design. The findings of this research provide valuable insights into the application of Cubic Trigonometry B-spline and Cubic Trigonometric Nu-spline techniques in the two-dimensional design of the Wau Bulan. Designers can use this knowledge to choose the best method based on their design goals and requirements such as to ensure the creation of visually captivating. For this study cubic trigonometric Nu-spline is the best method for designing Wau Bulan two-dimensional shape.

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and Merciful.

All praise to Allah and His Blessing. I am grateful for being given the opportunity to prepare this thesis. I also would like to express my deepest gratitude and appreciation to all those who have supported me throughout the completion of my final year project. Your support and guidance have been instrumental in the successful completion of my final year project.

First and foremost, I would like to express my sincere gratitude and appreciation to my supervisor, Madam Nursyazni binti Mohamad Sukri, and the Coordinator of the Final Year Project, Dr. Nur Atikah binti Salahudin, for their invaluable guidance, support, and encouragement throughout the duration of my final year project. Madam Nursyazni binti Mohamad Sukri has been an exceptional supervisor, providing me with expert advice, valuable insights, and constructive feedback at every stage of the project. Her extensive knowledge and experience in the field have been instrumental in shaping the direction of my research. I am truly grateful for their patience, dedication, and unwavering belief in my abilities. I would also like to extend my heartfelt thanks to Dr. Nur Atikah binti Salahudin for guidance in overseeing the overall progress of the final year project.

Finally, I would like to express my heartfelt appreciation to my family for their unconditional love, understanding, and constant encouragement. Their belief in my abilities has been a driving force behind my perseverance and determination to complete this project. And, to my friend, I am grateful to them for their unwavering support, motivation, and encouragement throughout this project.

TABLE OF CONTENTS

Page