

UNIVERSITI TEKNOLOGI MARA

**ANALYSIS OF GRAVE MISALIGNMENT IN
KAMPUNG SUNGAI BARU CEMETERY AREA
USING GIS**

MOHD FAIRUL AFIQ BIN MOHD ZULKEFLI

A thesis submitted in fulfilment
of the requirements for the degree of
Bachelor Science of Geomatics

Faculty of Architecture, Planning and Surveying

JULY 2017

AUTHOR'S DECLARATION

I declare that the work for this thesis/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I hereby acknowledge that I have been supplied with the Universiti Teknologi MARA Academic Rules and Regulations for Post Graduate, regulating the conduct of my study and research.

Name of Student : Mohd Fairul Afiq Bin Mohd Zulkefli
Student I.D. No. : 2013331651
Programme : Bachelor of Surveying Science and Geomatics
(Honours)– AP220
Faculty : Architecture, Planning & Surveying
Thesis/Dissertation Title : Analysis Of Grave Misalignment In Kampung Sungai
Bharu Cemetery Area Using GIS.

Signature of Student :

Date : July 2017

ABSTRACT

Nowadays, the usage of digital mapping has increased the uses and advantages of various kind of analysis and data collection methods. However, usage of digital mapping in cemetery areas are rare in Malaysia. Grave mapping seems does not seem to be taken seriously in any religion in Malaysia, although mapping is beneficial in many aspects. Action should be taken to create awareness and identify which part of any particular Muslim cemetery which has strayed from the Qiblah direction. The aim of this study is to determine the alignment of graves at the cemetery area of the Ameer Fawwaz Mosque in Kampung Sungai Bharu, Perlis. This research was conducted with the objectives: i) to spatially map the existing grave plot based on orthomosaic images, ii) to evaluate the percentage of Muslim graves in the Exact Direction, In Allowable Tolerance and Strayed categories iii) to classify the adjusted value of the Qiblah for the misaligned graves that do not adhere to the direction of the Qiblah. The orientation and position of graves were identified through orthomosaic photos acquired from the interpretation of Unmanned Aerial Vehicle (UAV) image in the Pix4D and ArcGIS software. After the map is produced it would identify the percentage of misaligned graves and adjusted value for the misaligned graves. The results would indicate how good or poor the determination of Qiblah direction for the cemetery area itself.

TABLE OF CONTENTS

CONTENT	PAGE
CONFIRMATION BY PANEL OF EXAMINERS	ii
AUTHOR'S DECLARATION	iii
ABSTRACT	iv
ABSTRAK	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATIONS	xi
CHAPTER ONE: INTRODUCTION	1
1.1 Introduction	1
1.2 Background of Study	1
1.3 Research Gap	2
1.4 Problem Statement	4
1.5 Aim	5
1.6 Objectives	5
1.7 Scope of Work	5
1.8 General Methodology	6
1.9 Significance of Study	7
1.10 Thesis Structure	7
1.11 Summary	8
CHAPTER TWO: LITERATURE REVIEW	9
2.1 Introduction	9
2.2 Geographic Information System	9
2.3 Aerial Survey	11
2.4 Qiblah Direction	13
2.5 Islamic Burial	17
2.6 Misaligned Cemeteries in Malaysia	18

2.7	Cemetery Mapping in GIS	19
2.8	Software	20
2.9	Summary	21
CHAPTER THREE: METHODOLOGY		22
3.1	Introduction	22
3.2	Research Methodology	23
3.3	Preliminary Study	25
3.4	Data Collection	31
3.5	Data Processing	34
3.6	Summary	40
CHAPTER FOUR: RESULT AND ANALYSIS		41
4.1	Introduction	41
4.2	Orthomosaic photo	41
4.3	Cemetery Mapping of Ameer Fawwaz Mosque	44
4.4	Verification Point Analysis	45
4.5	Percentage of Misaligned Cemetery	46
4.6	Adjusted Value of Qiblah Direction	47
4.7	Summary	48
CHAPTER FIVE: CONCLUSION AND RECOMMENDATION		49
5.1	Introduction	49
5.2	Limitation of Study	49
5.3	Conclusion	50
5.4	Recommendation	51
REFERENCES		53
APPENDICES		54