UNIVERSITI TEKNOLOGI MARA

GEO-LOCATION BASED MOBILE AR WAYFINDING FOR UITM PERLIS FRESHMEN

ROHAHAINI BINTI MAHMUD

Thesis submitted in fulfillment of the requirements for the degree of Bachelor of Science (Science, Surveying and Geomatics)

Faculty of Architecture, Planning and Surveying

July 2019
AUTHOR’S DECLARATION

I declare that the work in this dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results 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 Academic Rules and Regulations for Under Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student : Rohahaini binti Mahmud
Student I.D. No. : 2015218344
Programme : Bachelor of Science (Science, Surveying and Geomatics) – AP220
Faculty : Architecture, Planning and Surveying
Dissertation Title : Geo-location Based Mobile AR Wayfinding for UiTM Perlis Freshmen

Signature of Student : .................................................................
Date : July 2019
ABSTRACT

Every semester, universities always received new student intake from all over Malaysia. Being a new university student is the exciting part but, the worst part is freshmen having a trouble in getting familiar around new campus surrounding. Statistically, there are more than 60% of freshmen in UiTM Perlis experience this problem according to survey that had been performed. Together with technological developments that ingoing the revolution of Industry 5.0, geo-location based mobile AR wayfinding for UiTM Perlis freshmen is developed in order to show the wayfinding around campus. This study objectives are to navigate the unfamiliar surrounding for freshmen in UiTM Perlis using AR technique as wayfinding and indirectly to provide ease of use geolocation-based AR technique to UiTM Perlis freshmen by using this app. Location based AR technique is used for showing the POIs with distance in camera view by converting GPS coordinate to camera coordinate and Google Map API is used for showing the pathfinding for freshmen as an option. The results indicate that this app ease freshmen getting familiar with campus surrounding and gain new input about use of location-based AR. On this basis, this app indirectly entertains the freshmen who still awkward with new campus atmosphere. Future research is needed to improve the application that could strengthen the effectiveness of this app.

Keyword: augmented reality (AR), location-based AR, wayfinding application, mobile application
## TABLE OF CONTENT

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONFIRMATION BY PANEL OF EXAMINERS</td>
<td>i</td>
</tr>
<tr>
<td>SUPERVISOR’S DECLARATION</td>
<td>ii</td>
</tr>
<tr>
<td>AUTHOR’S DECLARATION</td>
<td>iii</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>iv</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td>v</td>
</tr>
<tr>
<td>TABLE OF CONTENT</td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>ix</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>x</td>
</tr>
<tr>
<td>LIST OF SYMBOLS</td>
<td>xii</td>
</tr>
<tr>
<td>LIST OF ABBREVIATIONS</td>
<td>xiii</td>
</tr>
</tbody>
</table>

### CHAPTER ONE INTRODUCTION

1.1 Research Background 1
1.2 Problem Statement 2
1.3 Research Aims and Objectives 4
1.4 Study Area 4
1.5 Significance of Study 5
1.6 Scope and Limitation of Research 6
1.7 Structure of the Thesis 7
1.8 Summary 8

### CHAPTER TWO LITERATURE REVIEW

2.1 Introduction 9
2.2 Navigation System 9
   2.2.1 Outdoor navigation 9
   2.2.2 Indoor Navigation 10
   2.2.3 Campus Navigation 11
3.7.2 Interface Design 44
3.7.3 Coding Algorithm 45
3.7.4 Debugging Application and APK Building 53

3.8 Summary 53

CHAPTER FOUR RESULTS AND FINDINGS ON GEO-LOCATION BASED MOBILE AR WAYFINDING FOR UiTM PERLIS FRESHMEN 54
4.1 Introduction 54
4.2 Implementation 54
   4.2.1 Camera View Module 54
   4.2.2 Map View Module 56
4.3 Usability Testing 58
   4.3.1 Questionnaires 58
   4.3.2 Analysis Description 58
   4.3.3 Descriptive Statistics 58
4.4 Functionality Testing 60
   4.4.1 Camera Module 61
   4.4.2 Map Module 61
4.5 Analysis of Geo-location Based Mobile AR Wayfinding for UiTM Perlis Freshmen 62

CHAPTER FIVE CONCLUSION AND RECOMMENDATION 64
5.1 Conclusion 64
5.2 Benefits 64
5.3 Restriction and Limitation 65
5.4 Recommendation/Future Work 66

REFERENCES 68

APPENDICES 71