An Evolutionary Approach to Locate Urban Public Services

Faculty of Information Technology,
University of Moratuwa

September 2010
Declaration

I declare that this dissertation does not incorporate, without acknowledgment, any material previously submitted for a Degree or a Diploma in any University and to the best of my knowledge and belief, it does not contain any material previously published or written by another person or myself except where due reference is made in the text. I also hereby give consent for my dissertation, if accepted, to be made available for photocopying and for interlibrary loans, and for the title and summary to be made available to outside organization.

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Date

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……………………
Date
Dedication

Dedicated to my loving parents and siblings

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Acknowledgements

I wish to thank my project supervisor, Prof. Asoka S. Karunananda, Dean, Faculty of Information Technology, University of Moratuwa, with my sincere gratitude for all the ideas, advice, suggestions, guidance and encouragement given to me throughout my course of study.

My special thanks go to Prof. M.T.R. Jayasinghe, Head, Department of Civil Engineering, University of Moratuwa for his encouragement and guidance given to complete this research successfully on time. I also thank Prof. J.M.S.J. Bandara and Dr.W.K. Mampearachchi in the Department of Civil Engineering, University of Moratuwa and Dr. J.N. Munasinghe and Mr. K.P. Fernando in the Department of Town & Country Planning, University of Moratuwa for all their support for providing valuable information related to Urban City Planning.

I appreciate the support given by Ms. Ishani Dias, Mr.Kelum & Ms.Chamari in the Department of Civil Engineering, University of Moratuwa in providing valuable information to carry out this research. I am also grateful to Mr.Shihan Silva for his great support and encouragement throughout the research.

Also, I would like to thank my colleagues, Mr.C.H. Satharasinghe, Mr.Vajira Somarathne, Ms.Ayomi Kandage and Mr.Shantha at the Computer Resources Unit, University of Moratuwa for their unforgettable support and encouragement given to me throughout the course of study. I take this opportunity to thank all the staff members in the Department of Civil Engineering, University of Moratuwa. I would not forget the support extended by the library staff members at University of Moratuwa.

Also, my sincere thanks goes to my fellow colleagues of M.Sc. in Artificial Intelligence(first batch) for the encouragement and support given to me throughout the research. Last but not least, my heartfelt gratitude goes to my family members, for their patience and encouragement.
Abstract

An Evolutionary Approach to Locate Urban Public Services postulates how the concept of negotiation in multi agent technology can be used to locate urban public services during city planning. The solution fundamentally comprises of three major categories of public service agents, namely, request, resource and message agents. Once the system is loaded by the human user, terrain data is fed into the system. The terrain agent will be created and draws the city map in the panel. Once the user creates a public service in the city environment, public service agents will be initialized on behalf of them. These, public service agents locate its position in the city, based on the tolerable influence and the inference between them. The system comprises of five modules, geography module, building services module, water services module, natural services module and transportation services module. Geography module handles the terrain related operations in the city environment. Building services module maintains the agent operations of buildings in the city. Water services module handles the operations related to water resources in the city while, natural services module represents agent operations of natural resources. Transportation services module maintains operations related to roads and other transportation resources. Each of the module acts as agents in the multi agent system. All the modules were implemented using Java platform and the agent functionalities were implemented on top of the madkit agent framework. Implemented system was tested to locate different public services under different city conditions. The system was evaluated by providing an evaluator panel an opportunity to build a specific city environment with some public services and to observe the interactions between those public services in the city. Thereafter, their comments about the functionality of the system were obtained and used to enhance the system. The test results reflect that the definition, planning, implementation, testing and documentation of the system had been carried out in an affective and efficient manner.

Key Words:
Urban Public Services, multi agent systems, madkit agent framework, Java Platform
Contents

Chapter 1 – Introduction 01
  1.1 Introduction 01
  1.2 Aim 04
  1.3 Objectives 04
  1.4 Proposed Solution 05
  1.5 System Requirements 06
  1.6 Structure of the thesis 06
  1.7 Summary 06

Chapter 2 – Current Approaches to Locate Urban Public Services 08
  2.1 Introduction 08
  2.2 Agent based approaches 08
  2.3 Cellular Automata and Vector based approaches 11
  2.4 Stochastic simulation techniques 13
  2.5 Virtual Reality and 3D Modelling 14
  2.6 Comparison of current approaches 14
  2.7 Problem in Brief 16
  2.8 Summary 16

Chapter 3 – Multi Agent Technology 17
  3.1 Introduction 17
  3.2 Requirements to Locate Urban Public Services 17
  3.3 Suitability of Multi Agent Technology 17
  3.4 Usage of Multi Agent Technology 18
  3.5 Summary 21

Chapter 4 – An Approach to Locate Urban Public Services 22
  4.1 Introduction 22
  4.2 Inputs to the system 22
  4.3 Outputs from the system 23
  4.4 Process 23
  4.5 Technology 25
Chapter 5 – Analysis & Design

5.1 Introduction

5.2 System Requirement Specification

5.3 Analysis

5.3.1 Geography module
5.3.2 Building services module
5.3.3 Water services module
5.3.4 Natural services module
5.3.5 Transportation services module

5.4 Design

5.5 Ontology

5.6 Summary

Chapter 6 – Implementation

6.1 Introduction

6.2 Major technologies used

6.2.1 Madkit
6.2.2 AGR Model
6.2.3 Protégé

6.3 Implementation of the Graphical User Interface (GUI)

6.3.1 Toolbox Panel
6.3.2 Virtual City Environment Panel
6.3.3 Message Panel

6.4 Implementation of Agents

6.4.1 Terrain Agent
6.4.2 Roadline Agent
6.4.3 Public Service Agents other than Roadline agents

6.5 Implementation of the Ontology

6.6 Features of the solution

6.7 Summary
Chapter 7 – Evaluation

7.1 Introduction 47
7.2 Experimental Setup 47
7.3 Selection of Participants 48
7.4 Obtaining Responses 49
7.5 Test Results 50
7.6 Summary 52

Chapter 8 – Conclusion & Further work

8.1 Introduction 53
8.2 Conclusion 53
8.3 Problems Encountered 54
8.4 Future Improvements 55
8.5 Summary 55

References 56
Appendix A 60
Appendix B 63
Appendix C 67
Appendix D 72
# List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 3.1</td>
<td>Multi-Agent System Architecture</td>
<td>19</td>
</tr>
<tr>
<td>Figure 4.1</td>
<td>Multi-Agent Based Approach for Locating Urban Public Services</td>
<td>24</td>
</tr>
<tr>
<td>Figure 5.1</td>
<td>Top level architecture of the Public Services Locating System</td>
<td>32</td>
</tr>
<tr>
<td>Figure B.1</td>
<td>Interaction of road agent with terrain agent</td>
<td>63</td>
</tr>
<tr>
<td>Figure B.2</td>
<td>Conversation between the road agent and airport agent</td>
<td>64</td>
</tr>
<tr>
<td>Figure B.3</td>
<td>Conversation between the road agent and the bank agent</td>
<td>64</td>
</tr>
<tr>
<td>Figure B.4</td>
<td>Conversation between the road agent and the airport Agent in another situation</td>
<td>65</td>
</tr>
<tr>
<td>Figure B.5</td>
<td>Conversation between airport agent and bank agent</td>
<td>66</td>
</tr>
</tbody>
</table>
# List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 5.1</td>
<td>Hierarchy of the City Ontology</td>
<td>34</td>
</tr>
<tr>
<td>Table 7.1</td>
<td>Standard Values Assigned</td>
<td>50</td>
</tr>
<tr>
<td>Table 7.2</td>
<td>Statistics of evaluation results</td>
<td>50</td>
</tr>
<tr>
<td>Table 7.3</td>
<td>Summarized Problem descriptions</td>
<td>51</td>
</tr>
<tr>
<td>Table 7.4</td>
<td>Summarized test results</td>
<td>51</td>
</tr>
<tr>
<td>Table 7.5</td>
<td>Summarized test results averaged</td>
<td>52</td>
</tr>
<tr>
<td>Table A.1</td>
<td>Interactions between public services</td>
<td>62</td>
</tr>
<tr>
<td>Table D.1</td>
<td>Evaluation Results</td>
<td>72</td>
</tr>
</tbody>
</table>
### List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI</td>
<td>Artificial Intelligence</td>
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<tr>
<td>AGR</td>
<td>Agent/Group/Role</td>
</tr>
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<td>CAD</td>
<td>Computer Aided Design</td>
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<tr>
<td>CRT</td>
<td>Cathode Ray Tube</td>
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<tr>
<td>EMS</td>
<td>Environmental Management Systems</td>
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<td>GIS</td>
<td>Geographical Information Systems</td>
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<td>GUI</td>
<td>Graphical User Interface</td>
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<tr>
<td>MAS</td>
<td>Multi Agent Systems</td>
</tr>
<tr>
<td>SRS</td>
<td>System Requirements Specification</td>
</tr>
<tr>
<td>VR</td>
<td>Virtual Reality</td>
</tr>
</tbody>
</table>