



**DEVELOPMENT OF OPTIMIZED MOBILE AGENT  
TASK PATTERN USING PUSH-ALL-DATA  
STRATEGY**

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This thesis was submitted in partial fulfillment of the requirements for the  
Master's Degree of Science in Software Engineering

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May 2019

## **AUTHORIZATION STATEMENT**

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## **DEDICATION**

This thesis is dedicated to my family those who have always motivated me and played a great role in the completion of this thesis. Secondly, I dedicate also this dissertation to my supervisors Dr. Aysh Al-Hroob and Dr.Faiz Al-Shrouf who have guided me during the project period. Lastly, I dedicate this thesis to all my friends who gave me their support and advice.

## **ACKNOWLEDGMENT**

First and foremost, I would like to praise Allah S.W.T the Almighty for giving me the strength to complete this thesis. I would like to express my deepest appreciation to my supervisors Dr. Aysh Al-Hroob and Dr.Faiz Al-Shrouf for their guidance through these two years of my master studies. Their patience, confidence, and encouragement helped me to successfully complete this research. I will always be in debt to them for their professional support and wise words.

This project would not have been possible without the support of my family. I am grateful to them for their love, encouragement, and prays.

I also express my thankfulness to all my friends who believed in me and showed me their warmth and friendship.

My respect and gratitude to Dr. Ayad Al-Zubaidi for his guidance and support.

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## LIST OF ABBREVIATIONS

#	Abbreviation	Full Expression
1.	MA	Mobile Agent
2.	GA	Genetic Algorithm
3.	NCA	Node Compression Algorithm
4.	ARE	Agent Runtime Environments
5.	QoS	Quality of Service
6.	NCSA	Compression Based Search Algorithm
7.	TSP	Travel Salesman Problem
8.	V	Vertex
9.	G	Graph
10.	W	Weight
11.	E	Edge
12.	GUI	Graphical User Interface
13.	IDE	Integrated Development Environment
14.	LPM	Linear Prediction Model
15.	JEE	Java Execution Environment
16.	<s>	Source
17.	<t>	Destination
18.	$P_c$	Parameter Crossover
19.	$P_m$	Parameter Mutation

## Abstract

The computer systems have evolved from a monolithic computer device to a much more complex client- server environment in previous years. One of those newly developed technology is the mobile agent. Because of its innovative capabilities and attractive application, mobile agents have long captured the attention of researchers and industry. Mobile agents are computer program that can automatically migrate from host to host, transfer their internal state, enable them to perform task more conveniently, more robustly and more efficiently than traditional client- server application in network and distributed environments.

In this work, best path in minimal time is found by migrating the mobile agent from the source node to the destination node using mathematical process and optimization technique. Genetic Algorithm is used to overcome the problem of selecting the best path rather than shortest path that is used in previous work. Shortest path is not mean optimal path in all time. This work focuses on how to minimize the number of nodes that are used to transfer data from source to destination using combining the sequential nodes from time point view using Node Compression Algorithm (NCA). When comparing adaptive algorithms with each other, time is considered as essential measures for selecting best path (minimum time). Using time measurement after 10 optimization iterations as minimum and holding to the result. The proposed approach shows that using hybrid approaches GA and NCA reduce the time of selecting the best path using GA from 336.448 *ms* to 286.29 *ms* for 10<sup>th</sup> iteration and reduce the time in other iterations as well. This results show the importance of using optimization techniques in cloud computing to help of overcome the distributed nature and minimize the time of transferring data within minimum time complexity.

**Keywords:** Mobile Agent, Genetic algorithm, Push-All-Data Strategy, Design Pattern (Master-Slave), Node Compression Algorithm.