

## 4270575321 : MAJOR ELECTRICAL ENGINEERING

KEY WORD: INFORMATION RETRIEVAL / MOBILE AGENT / ITINERARY CREATION  
ALGORITHM

SOMCHAI SANGTHONGSAKULLERD: AN ALGORITHM FOR MOBILE AGENT  
ALLCATION IN INFORMATION RETRIEVAL SYSTEM. THESIS ASSIST.ADVISOR :  
LUNCHAKORN WUTTISITTIKULKIJ ,Ph.D. 134 pp. ISBN 974 – 03 – 1062 – 1.

The thesis proposes the mobile agent itinerary creation algorithm by modifying the traditional Simulated Annealing and Tabu Search algorithm in conjunction with proposed heuristic (HR) algorithm and then compares with Brute Force Search algorithm (BF), Simulated Annealing algorithm (SA), Tabu Search Algorithm (Tabu), Modified Compact Genetic Algorithm (McGA), which modified from Compact Genetic Algorithm (cGA), and Random Uniformly Algorithm (RU). To show the pros and cons of each algorithm, the parameters MMSRC (Minimum of Maximum Sub-Route Cost) and Processing Time are used as the key parameters. The results show that in the case of the number of nodes in network is low, HR gives the result slightly worse than MMSRC with respect to BF, SA, Tabu and McGA but greatly better than RU. In the case of the high number of nodes HR gives the better MMSRC with respect to the result from SA. Furthermore, given the processing time parameter HR gives obviously less average processing time with respect to the others.

In this thesis the development of Mobile Agent's itinerary creation algorithm is based on the concept of Traveling Salesman Problem (TSP). For the TSP problem, on his return, the salesman is not allowed to take the same route. This is in contrast to the Mobile Agent's itinerary creation application. With the itinerary creation application, the Mobile Agents are entitled to return to the same node they have previously passed. To study the impact of this discrepancy this thesis extends the investigations by introducing a reduced matrix technique so as to analyze the Mobile Agent's itinerary creation application in the case of allowing the return to the previously passed node. The use of reduced matrix technique is categorized into 2 cases, namely *replacement* and *application* technique. The result shows that in general the *application* technique gives better result than the *replacement*. However in some cases the *application* technique may offer poorer results than the MMSRC that does not use the reduced matrix technique whereas the *replacement* always offers better MMSRC than the MMSRC that does not use reduced matrix technique. Although reduced matrix technique gives better results but the difference is marginal, i.e. within 10%. As a result it is reasonable to conclude that allowing Mobile Agent to return to the previously passed node does not cause significant impact on the overall system costs.