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Analysis of the Result of the Ant Colony System Adaptive on Tourism Object

(Jember Tourism Object - Indonesia)

Devie Rosa Anamisa, Eka Mala Sari Rochman, Aeri Rachmad
Faculty of Engineering
University of Trunojoyo Madura
Indonesia
devros_gress@yahoo.com, aery_r@yahoo.com, ekamala.sari@yahoo.com

***Abstract*—Jember Regency has a place that contains elements of cultural, historical, educational, recreational values that are spread out, especially in the field of natural tourism. However, these tourist tourism object received less attention from the local tourism agency so that little information was received by the public regarding some of the attractions in Jember Regency. In addition, to go to the tourist attraction must pass through areas with steep roads so that a map is needed to get there that can provide information on road conditions that can be passed and does not require a long time. Therefore, this study has designed a fastest track search application that can help tourists to get to know various kinds of tourist objects in Jember Regency along with routes that must be passed to get to or from tourist attractions in Jember Regency. With a short time. In the application of the fastest track search, an optimization method is needed which can provide the optimum distance effect with a short time. In this study using the effect of the number of ants on the Ant Colony System (ACS) method to produce the optimal number of ants in finding the fastest path to the tourist attraction in Jember Regency. The purpose of this study is to provide the fastest route solution to the tourist sites in a short time and help introduce various kinds of tourist objects in Jember Regency that are not widely known by tourists. So that with this system it can simplify and accelerate the tourists in finding and obtaining information about the location of tourist attractions with the fastest route found in Jember Regency**

Keywords— Tourism Object, Fastest Track Search, Optimization, Adaptive Ant Colony System

I. INTRODUCTION

Tourism in Indonesia is important for economic development for both countries and regions. Jember Regency has a place that contains elements of cultural, historical, educational, recreational values that are spread out, especially in the field of natural tourism. Based on data, the number of tourists visiting the most tourist attraction in East Java Province is in Jember Regency. Besides Jember, it is well-known for its diverse and scattered potential. But the paths to the tourist attraction have a tremendous impact on congestion at a certain time, causing the traveler to choose an alternative route or the fastest route to his destination by avoiding congestion. Congestion is a serious problem for travelers because it can cause a lack of time efficiency, and can also cause less attractive tourist attractions surrounded by traffic jams [1] [2]. Therefore, support from the tourism office and the local community is needed to provide information on the fastest alternative routes to the tourist attraction. When searching for the fastest path, the shortest path does not have to be the fastest and the longest path does not mean the longest [3] [4]. This is due to the presence of road density factors which cause the shortest path to be longer than the longer path.

To get the fastest alternative routes to tourist sites in Jember district, an optimization method is needed. This research has developed the fastest track search application using the influence of the number of ants on the ant colony system (ACS) with the aim that the fastest path can be used as an optimal solution with fast computing time [5] to determine the trip with the fastest path from and to the tourist attraction in Jember so that the results of the fastest track search will be a consideration in making decisions to show the path to be followed and the efficiency of time, cost and effort, components, incorporating the applicable criteria that follow.

II. RESEARCH METHOD

A. Selecting a Template (Heading 2)

In this study using methods in order to collect the data needed in this study is the name of the road data in Jember Regency either to or from tourist sites and tourist data in Jember Regency, 98 data path names to the object tours with an average distance of 3.5 km between alternative routes to tourist sites in Jember Regency, East Java in accordance with existing conditions and road density data, can be seen in table 1.

TABLE I. ROAD DENSITY COEFFICIENT

Volume		Density		
		μ_l	μ_n	μ_d
the length of the road	*Short*	0.1	0.25	0.5
	Moderate	0.25	0.5	0.75
	Long	0.5	0.75	1

Natural tourism in Jember Regency, such as papuma beach and watu ulo, puger beach, patemon natural bath, tancak waterfall, Rembangan bath, Agung Gardens bathing, Bedadung Hill and Raung Slope waterfall. In heading to the tourist attraction, tourists usually use maps to find travel routes so they don't take the wrong track. And usually use a service provider site that is well-known and commonly accessed like Google Maps. Google maps have limited information such as remote areas and steep lanes [6]. But Google map is able to find the shortest path. But the shortest path is not necessarily the fastest route. When searching for the fastest path, the shortest path does not have to be the fastest and the longest path does not mean the longest. This is due to the presence of road density factors which cause the shortest path to be longer than the longer path. The city of Jember is famous for the potential of a very diverse and scattered tourist attraction. But the routes to the tourist attraction have a congestion impact at a certain time so that many tourists choose alternative routes that have relatively small congestion to go to tourist locations by considering efficiency, time and costs.

In this study to search for the fastest path to tourist sites using the influence of the number of ants on the Ant colony System (ACS) method. The workings of the ACS method to find the fast track on tourist sites are carried out by moving from one node to the next node with high pheromone evaporation to get the best and optimal solution in arranging the path of each ant's visit to each city [7]. In the process of compiling a route for each ant to each city. Ant colonies that have been distributed to a number or each city, will begin to travel from the first city each as the city of origin and one of the other cities as the destination city. Then from each second city, the ant colony will continue the journey by choosing one of the cities that are not found in $tabu_k$ as the next destination city. The journey of the ant colony continues until all cities are visited one by one or have been occupied by $tabu_k$ [8]. If s states the index of the visit order, the city of origin is expressed as $tabu_k$ (s) and other cities are expressed as {N-$tabu_k$} [9].

III. RESULT AND DISCUSSION

The results of the study were conducted by looking for the fastest path of tourist sites using the influence of the number of ants on the ant colony system (ACS) method. The results of determining the fastest path will be a consideration in making decisions to show the path to be taken. From several trials conducted, the optimal path results were obtained when the q0 value was small and the number of cycles was large because the transfer of ants was done randomly. This allows all ants to overlook all possible paths by analyzing the effect of the number of ants and N cycles, can be seen in Figure 1

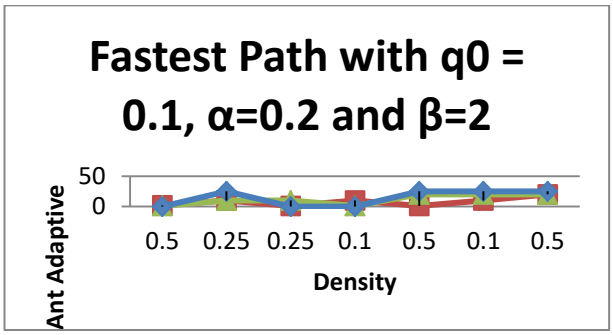

Fig. 1. Influence the Amount of Puger area to Patemon

IV. CONCLUSION

After the text edit has been completed, the paper is ready for the template. Duplicate the template file by using the Save As command, and use the naming convention prescribed by your conference for the name of your paper. In this newly created file, highlight all of the contents and import your prepared text file. You are now ready to style your paper; use the scroll down window on the left of the MS Word Formatting toolbar. In this study, it has succeeded in designing and building an application to find the fastest path to tourist sites by showing the path to be traveled and the efficiency of time, cost and energy so that the results of the fastest track search will be a consideration in decision making. Besides that tourists can find out in full the routes that can be taken both steep and unhindered road conditions, which can help limit the information possessed by Google Maps which is a lack of complete information about data areas that are still remote and steep lanes. In addition, some of the trials produced as shown in Figure 1 show that the greater the density value means the longer the journey to the tourist site and vice versa based on data 98 data on the path to the tourist attraction with an average distance of 3.5 km values between 0.1 to 1 resulting in a selection of paths that are more suitable to the real conditions because it contrasts the road density variable. With the influence of the number of ants on the ACS method, the solution to the fastest path is affected by the closer the optimum distance, the more the number of ants that affect. So the number of ants that go through will change at any time, and the chosen route can change at any time.

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