



## THEORETICAL ANALYSIS OF ORS TOOLS ON GEOGRAPHIC INFORMATION SYSTEMS FOR MAPPING HISTORICAL TOURISM AREA IN THE CITY OF BANJARMASIN

Muhammad Muhaimin<sup>1</sup>, Fitri Mardiani<sup>2</sup>, Jumriani<sup>3</sup>

<sup>1</sup>Program Studi Pendidikan Geografi, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Lambung Mangkurat, 70123, Indonesia, Email: [muhammad.muhaimin@ulm.ac.id](mailto:muhammad.muhaimin@ulm.ac.id)

<sup>2</sup>Program Studi Pendidikan Sejarah, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Lambung Mangkurat, 70123, Indonesia

<sup>3</sup>Program Studi Pendidikan IPS, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Lambung Mangkurat, 70123, Indonesia

### ABSTRACT

#### Article History

**Submitted:**

18 October 2023

**Reviewed:**

26 October 2023

**Accepted:**

06 November 2023

**Published:**

15 November 2023

The research objectives include developing an isochrones computational model for historical site tourism in Banjarmasin City, analyzing isochrones computational modelling in mapping the fastest and shortest routes for historical site tourism in Banjarmasin City, and analyzing isochrones computational modelling to determine the distance-time matrix for historical site tourism in Banjarmasin City. Data analysis techniques to produce research objectives include analysis of historical sites in Banjarmasin City which is used to calculate the position of historical sites relative to other historical sites to analyze the best tourist routes for historical sites in Banjarmasin City. The research results confirm that the isochrones computing model can use a

Geographic Information System (GIS) with QGIS and GraphHopper software for historical site tourism in Banjarmasin City

**Keywords:** Geographic Information Systems; Tourist Areas; Historical Tourism

### INTRODUCTION

The tourism sector is part of national development, which aims to develop a region (Katuwu et al., 2023);(Nursalam & Syahputra, 2023); (Oktaviani & Yuliani, 2023); (Yakup & Haryanto, 2019). Various tourism potentials in each region continue to be developed as sectors that can contribute to improving the country's economy. Tourism destinations are developed based on potential tourist attractions which are developed synergistically with the development of tourist facilities, public facilities, accessibility and community empowerment in a complete and sustainable system (Zhang et al., 2021).



Development intervention is also implemented by the Banjarmasin City government to increase the potential for local original income (PAD) from levies on tourist attraction areas starting in 2023 (Agency, n.d.). This increase and development are, of course, following the number of tourists in Banjarmasin City, which in the last three years has continued to increase, namely in 2019 as many as 681,752 people, in 2020 as many as 733,816 people, in 2021 as many as 783,837 people and in 2022 as many as 840,587 people (Data from the City Culture and Tourism Office Banjarmasin, 2022). The increasing number of tourists is a positive opportunity to develop the tourism sector.

Tourist attractions can increase PAD, including historical site tourism (Masruroh & Nurhayati, 2016); (Sombang et al., 2018). The existence of historical sites in the city of Banjarmasin is an attraction for tourists. It can be used as a learning resource for residents who are interested in learning about the history of the city of Banjarmasin. (Rochgiyanti et al., 2022). History is the result of the reconstruction of past human creativity, feelings, intentions and works, of course, by formulating the existence of historical sites so that they remain sustainable and play a role in the future of a nation. Remains of past events in a place can be called a historical site. There are many types, varieties and forms of historical sites. Historical sites which are legacies of the past are spread throughout the archipelago, starting from pre-literacy, the influence of Hinduism and Buddhism, the entry of Islamic culture and religion to the presence of Western influence through colonial activities (Brata et al., 2021). Historical sites are said to have symbolic meaning because sites as legacies of the past are historical facts that can connect people with their past. This historical site tourism was developed from the available historical sites in each region, which have unique historical characteristics compared to other regions, so the city of Banjarmasin can be developed as a historical tourist site.

The relatively complex arrangement of the tourist route system in Banjarmasin City makes it difficult for tourists to access roads to historical sites because tourists need help with the large number of roads and the complexity of traffic in Banjarmasin City. (Arisanty et al., 2019) (Fathona et al., 2020). Moreover, no digital information regarding road conditions and the closest distance to historical sites is available. Everyone on a tourist trip chooses the shortest distance to reach their destination because it can save time, energy and fuel costs (Aslam, 2022; (Simanjuntak et al., 2023). Information on routes to historical sites is essential for the public and tourists. Historical site tourism is one of the various aspects of tourism that requires information services for local governments, communities and tourists (Kristiani et al., 2023).

The increasingly advanced and rapid development of digital technology makes every society use information technology (Khulwani & Hakim, 2023); Kristen et al., 2023; Putri, 2023). Many parties increasingly need information systems; users need this information for various purposes. Geographic Information Systems (GIS) is a highly developed technology. GIS can be used to collect, process and analyze data. The data collection, processing and analysis results can help solve a problem (Nurfaiza et al., 2023; Trianto et al., 2023). The GIS method was developed to assist in solving several problems, one of which is in the tourism sector.

The fastest and shortest path computing model owned by GIS can help problems in tourism related to structuring a complex historical site tourist route system in

Banjarmasin (Więckowski et al., 2014). The fastest and shortest path computing model can analyze all the historical sites that tourists can visit from the starting point within a specific period. The GIS computing model can be used to calculate the distance between two points based on an algorithm for finding the shortest path, making it more efficient in travel time and costs.

## METHOD

Research methods are a collection of methods selected and used in data collection techniques, analysis techniques and data interpretation. The method used in the research is quantitative descriptive. Location is a relative or absolute position that provides location conditions in an area. Banjarmasin is geographically located in South Kalimantan Province with an area of 98.46 km<sup>2</sup>. Banjarmasin, the capital of South Kalimantan Province, is located in the southern part of Kalimantan Island and borders directly on the Java Sea. Administratively, it is an autonomous city (Banjarmasin et al. Agency, 2012). Astronomically, the city of Banjarmasin is located between 3° 16' 46" to 3° 22' 54" South Latitude and 114° 31' 40" to 114° 39' 55" East Longitude. The research population is historical sites in the administrative area of Banjarmasin City. The results of the identification and literature sources of historical sites recorded in Banjarmasin City amount to 26 historical sites spread across five sub-districts of Banjarmasin City.

## RESULTS AND DISCUSSION

Tourism is travel from one place to another, temporary in nature, carried out by individuals or groups to find balance/harmony and happiness with the environment in social, cultural, natural and scientific dimensions (Spillane, 1994). Tourism is a process of temporary departure of one or more people to another place outside where they live (Pendit & Paramita, 2006). The impetus for his departure was due to various economic, social, cultural, political, religious, health or other interests, such as simply wanting to know, gain experience or learn.

Site utilization of historical heritage as a tourist attraction is a step forward in increasing awareness of history in the era of globalization. A form of concern for history is the same as surviving for the future. Learning about history offers problems with various patterns, so humans are blessed with dynamic thinking.

A historical site is a place where remains in the form of fossil objects are found in the area proposed for research; fossils in Latin fossa, which means "to dig out from the ground, are the remains or traces of living creatures that become stones or minerals. In historical science, historical building objects are visible data or sources that can be held; these objects and buildings are called artefacts. This means that, on the one hand, objects and buildings are called historical data, but on the other hand, they are called historical facts. The objects and buildings exist, but the social facts are no longer visible because the event only happened once, as mentioned. Artefacts are invisible facts stored in the brain's memory or in human documents. The documents appear clearly like artifacts but mentifacts only automatically come out of the document after reading it carefully (Priyadi, 2011).

The site is part of the realm of archaeology, namely the science of archaeology, which studies artefacts, ecofacts and features. It reviews the history of human

cultural activities in the past, from prehistoric times (before there was writing) to historical times (there was writing) through primary sources in the form of material culture and environmental conditions from past civilizations (A. Nurkidam & Herawaty, 2019). The study of historical sites should be a combination of history and archaeology. Both discuss the past but are limited to the realm of archaeology which tends to use sources in the form of physical objects (remains of the past) and history uses sources from writing (A. Nurkidam & Herawaty, 2019).

Table 1 Historical Sites in Banjarmasin City

Region	Historic Site
North Banjarmasin	Sultan Suriansyah Tomb Complex Sultan Suriansyah Mosque Prince Antasari's Tomb Complex Sungai Jingah Jami Mosque Tuhfaturroghibin Jami Mosque (Kanas Mosque) Traditional House Builds a Warehouse Surgi Mufti Dome Wasaka Museum Banjar Sungai Jingah Village
East Banjarmasin	Monument 9 November 1945 Sudimampir Bridge
South Banjarmasin	Santa Maria Middle School, Banjarmasin
West Banjarmasin	Habib Basirih Dome Old Port
Central Banjarmasin	Arab Village Old Market Bridge (JP Coen) Sabilal Muhtadin Grand Mosque Bank Indonesia Banjarmasin City Forest Park Cambodian Gardens Chinese Village (Chinatown) Po An Kiong Temple NV Handel Maatschappij Oentjeng Factory Cathedral Church Zero Kilometer Monument Anno House 1925

Source: Research data, 2023

Based on this table, several historical tourist sites exist in Banjarmasin City. This historical site data can be used to calculate the position of historical sites relative to other historical sites to analyze the best tourist routes for historical sites in Banjarmasin City. This data was obtained from identification results and literature sources, and then a field survey was carried out using GPS to obtain the geographical position of the historical site. The data was entered into Open Street Map (OSM) and Google Earth.

Road network data, width, length, road conditions, travel distance and congestion, are used to analyze distances from historical sites to other historical sites to produce the shortest route, fastest route, and isochrones map. Rwidth width

and road length were obtained from data extraction from Open Street Map (OSM), Google Earth, and RBI maps in <https://tanahair.Indonesia.go.id/portal-web>. Road conditions, distance travelled and traffic jams were obtained from field surveys with GPS and observations.

The process of implementing isochrone-based analysis using GraphHopper and QGIS is explained in the following image:

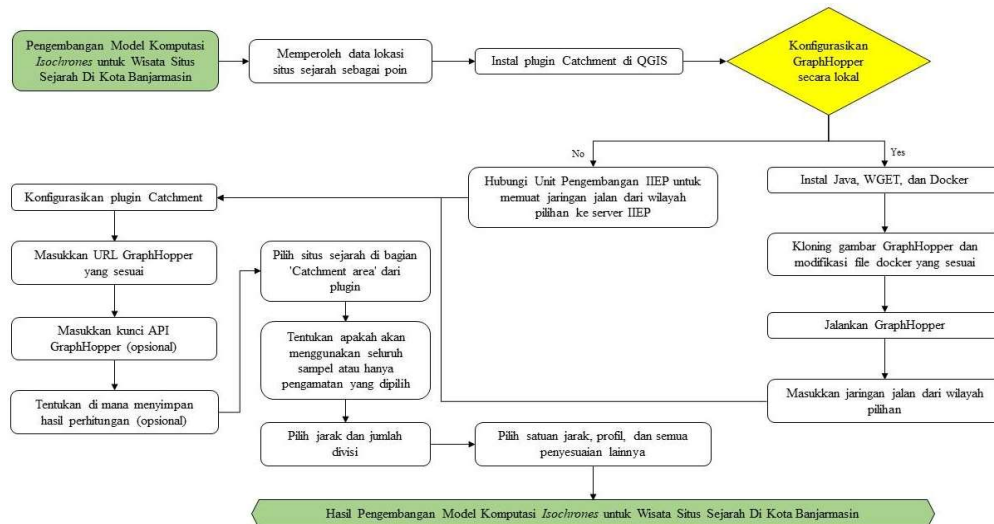


Figure 4.2 Flow chart for developing an isochrones computational model for historical site tourism in Banjarmasin City

An isochron is an area centred on a particular point or line, indicating the area that a particular mode of transportation can cover at a specific time. Isochrone maps can be calculated for different modes of transportation and can consider natural, cultural and contextual obstacles in travelling to historical sites. Technical settings for troubleshooting routes usually have route applications that work locally or remotely. Small-scale routing problems, such as those in districts or small cities, can be analyzed with modern computers. However, larger research areas such as provinces or countries require large amounts of memory to build networks and solve complex optimization problems in finding the best possible routes. Therefore, a more common technical setup involves a web application, a geographic information system (GIS) desktop tool, and a back-end server dedicated to the routing application. The back-end server then routes applications using an application programming interface (API).

## CONCLUSIONS

This tourism geographic information system can display spatial data visualization of tourist maps of historical sites in Banjarmasin City. Through this application, you can find the shortest and fastest route between historical site tourist attractions in Banjarmasin, namely 23 historical site tourist attractions, using the Dijkstra algorithm. More effective shortest or fastest route search results can be obtained by adding parameters other than distance travelled, for example, calculating travel costs, alternative public transport, traffic regulations, etc.

Therefore, further development is needed for the speed of map access and the appearance of map visualization.

## REFERENCE

- A. Nurkidam, A. N., & Herawaty, H. (2019). Arkeologi Sebagai Suatu Pengantar (1; Vol. 1, Issue 1). CV. Kaaffah Learning Center. <http://repository.iainpare.ac.id/1699/>
- Agency, A. N. (n.d.). Pemkot Banjarmasin gali potensi PAD dari pariwisata. ANTARA News Kalimantan Selatan. Retrieved October 18, 2023, from <https://kalsel.antaranews.com/berita/352375/pemkot-banjarmasin-gali-potensi-pad-dari-pariwisata>
- Arisanty, D., Putro, H. P. N., & Anis, M. Z. A. (2019). Pemberdayaan Perempuan Pada Kawasan Wisata (Studi Pada Pasar Terapung Lok Baintan). Jogja Bangkit Publisher. <http://eprints.ulm.ac.id/5095/>
- Brata, I. B., Anto, R., Wartha, I. B. N., & Saputra, I. P. A. (2021). SITUS SEJARAH PEREKAT KERUKUNAN DAN MAKNANYA DALAM KEHIDUPAN BERBANGSA DAN BERNEGARA. Jurnal Santiaji Pendidikan (JSP), 11(2). <https://doi.org/10.36733/jsp.v11i2.2437>
- Fathona, G., Hakim, A. H., & Juwito, R. S. (2020). PENATAAN PENEMPATAN LOKASI PAPAN PETUNJUK JALAN DAN INFORMASI (SIGNAGE SYSTEM): LOSARI : Jurnal Arsitektur Kota Dan Pemukiman, 82-94. <https://doi.org/10.33096/losari.v5i2.123>
- Katuwu, S. A., Walewangko, E. N., & Masloman, I. (2023). STRATEGI PENGEMBANGAN OBJEK WISATA DANAU POSO DALAM UPAYA PENINGKATAN PENDAPATAN ASLI DAERAH (PAD) KABUPATEN POSO. Jurnal Berkala Ilmiah Efisiensi, 23(2), Article 2.
- Khulwani, A., & Hakim, A. R. (2023). SOSIALISASI STRATEGI PENGEMBANGAN DIGITALISASI UMKM DI DESA SABAJAYA. ABDIMA JURNAL PENGABDIAN MAHASISWA, 2(1), Article 1.
- Kristiani, S., Priyastomo, M. D., Sapitri, H., & Novi Haryati, S. (2023). PESONA TAWANGMANGU: INOVASI DIGITALISASI BERBASIS APLIKASI MOBILE SEBAGAI UPAYA PENINGKATAN LOCAL WISDOM DAN PEREKONOMIAN MASYARAKAT TAWANGMANGU. Lomba Karya Tulis Ilmiah, 4(1), Article 1.
- Masruroh, R., & Nurhayati, N. (2016). STRATEGI PENGEMBANGAN PARIWISATA DALAM RANGKA PENINGKATAN PENDAPATAN ASLI DAERAH DI KABUPATEN KUNINGAN. Prosiding Seminar Nasional IPTEK Terapan (SENIT) 2016 Pengembangan Sumber Daya Lokal Berbasis IPTEK, 1(1), Article 1. <https://ejournal.poltektegal.ac.id/index.php/prosiding/article/view/369>
- Nursalam, C., & Syahputra, E. (2023). Potensi Tradisi Grebeg Dalam Meningkatkan Kunjungan Wisatawan Daerah Istimewa Yogyakarta. Gemawisata: Jurnal Ilmiah Pariwisata, 19(1), Article 1. <https://doi.org/10.56910/gemawisata.v19i1.267>
- Oktaviani, A. B., & Yuliani, E. (2023). Dampak Pengembangan Pariwisata Terhadap Kondisi Ekonomi Masyarakat. Jurnal Kajian Ruang, 3(1), Article 1. <https://doi.org/10.30659/jkr.v3i1.22574>



- Rochgiyanti, R., Sriwati, S., Akmal, H., & Abidin, Z. (2022). Mengenal Situs Sejarah Di Kota Banjarmasin Bersama Borneo Historical Community (BHC). *Bubungan Tinggi: Jurnal Pengabdian Masyarakat*, 4(4), Article 4. <https://doi.org/10.20527/btjpm.v4i4.6084>
- Simanjuntak, M., Faridi, A., Indrayanti, S., Frisiska, F., Pratiwi, I. I., Siagian, V., Ferinia, R., Nasrullah, N., Murdana, I. M., & Latif, L. (2023). *Digital Tourism*. Yayasan Kita Menulis.
- Sombang, C. A., Sambiran, S., & Rachman, I. (2018). STRATEGI DINAS PARIWISATA KABUPATEN MINAHASA UTARA DALAM MENINGKATKAN PENDAPATAN ASLI DAERAH. *JURNAL EKSEKUTIF*, 1(1), Article 1. <https://ejournal.unsrat.ac.id/v3/index.php/jurnaleksektif/article/view/21939>
- Więckowski, M. (1971-), Michniak, D., Bednarek-Szczepańska, M. (1980-), Chrenka, B., Ira, V., Komornicki, T., Rosik, P., Stępnik, M., Székely, V., Śleszyński, P., Świątek, D. (1975-), & Wiśniewski, R. (2014). Road accessibility to tourist destinations of the Polish-Slovak borderland: 2010-2030 prediction and planning. *Geographia Polonica*, 87(1), 5–26.
- Yakup, A. P., & Haryanto, T. (2019). Pengaruh Pariwisata terhadap Pertumbuhan Ekonomi di Indonesia. *Bina Ekonomi*, 23(2), Article 2. <https://doi.org/10.26593/be.v23i2.3266.39-47>
- Zhang, H., Duan, Y., & Han, Z. (2021). Research on Spatial Patterns and Sustainable Development of Rural Tourism Destinations in the Yellow River Basin of China. *Land*, 10(8), Article 8. <https://doi.org/10.3390/land10080849>