e-ISSN 2549-7472
Edumatic: Jurnal Pendidikan Informatika
Volume 10, Issue 2, **380-389.**
https://e-journal.hamzanwadi.ac.id/index.php/edumatic
DOI: 10.29408/edumatic.v10i2.35513

Spatial Decision Support for WiFi Installation Priority using Oreste and Location-Based Services

Nanang Aris Setyawan [1,*], Raden Rhoedy Setiawan [1], Yudie Irawan [1]

[1] Universitas Muria Kudus, Indonesia
[*] Corresponding author: Nanang Aris Setyawan, Universitas Muria Kudus, Indonesia
202153073@std.umk.ac.id

Received: 15 June 2025 | Revised: 23 June 2026 | Accepted: 29 July 2026 | Published: 17 August 2026

Abstract
Determining the best locations for Wi-Fi installation involves a complex spatial decision-making process that considers technical, operational, and geographical factors. Many existing studies tend to use either Multi-Criteria Decision Making (MCDM) or Location-Based Services (LBS) separately, which limits the ability to combine ranking results with spatial decision support. This study introduces a web-based Spatial Decision Support System (SDSS) that merges the ORESTE method with LBS to prioritize WiFi installation sites at PT Foura Inti Sinergi. The system was created using the Waterfall model and assessed based on five decision criteria: proximity to the Optical Distribution Point (ODP), installation expenses, potential customer density, ease of technician access, and risk of network disruption. Five potential sites, identified through company survey data, were evaluated using the ORESTE ranking method, and the LBS displayed the prioritized sites on an interactive digital map. The system's rankings matched the manual ORESTE calculations perfectly and effectively integrated decision outcomes with geographic data, facilitating a more efficient understanding of installation priorities. Functional testing across 49 scenarios showed a 100% success rate, thereby demonstrating the reliability of the system. This proposed framework enhances spatial decision support by combining ordinal multi-criteria ranking with location-aware visualization, offering a practical solution for planning telecommunication infrastructure and other spatial-site selection tasks.

Keywords: decision support system; location-based service; multi-criteria decision making; network infrastructure planning; oreste

To cite this article: Setyawan, N. A., Setiawan, R. R., & Setiawan, Y. (2026). Spatial Decision Support for WiFi Installation Priority using Oreste and Location-Based Services. *Edumatic: Jurnal Pendidikan Informatika*, *10*(2), 380–389. https://doi.org/10.29408/edumatic.v10i2.35513

INTRODUCTION

The growing demand for Internet services drives the expansion of telecommunications infrastructure across different areas. Selecting installation sites is crucial in building networks, as each potential site presents unique conditions related to its proximity to existing infrastructure, development expenses, potential user base, availability of technicians, and network status. These factors make site selection a multi-criteria decision-making (MCDM) challenge, as it requires evaluating alternatives based on multiple criteria simultaneously. The MCDM method, when integrated with a Geographic Information System (GIS), has been applied to various site selection issues, such as choosing locations for waste disposal facilities, logistics hubs, power stations, and transportation infrastructure (Armanuos & Elgaafary, 2023; Debnath, 2026; Feng et al., 2023; Shao et al., 2025).

The combination of MCDM and geographic information enables the inclusion of location attributes in decision making. This methodology has been utilized for selecting sites for rainwater harvesting, wind energy installations, parking areas, and refueling stations (Alkaradaghi et al., 2022; Yaman, 2024; Kazemi & Hosseinpour, 2022; Terzi et al., 2025). GIS and MCDM have also been used to select locations for solar power plants and electric vehicle charging stations (Krishankumar & Ecer, 2024; Almasad et al., 2023; Li et al., 2025). Nonetheless, some studies continue to concentrate on evaluating or ranking sites using particular MCDM techniques, indicating that the integration of ranking outcomes with geographic data can be further enhanced in location-based decision support systems.

Recent advancements have resulted in the creation of a Spatial Decision Support System (SDSS), which integrates spatial data with decision analysis. Krügel et al. (2024) developed an online SDSS that merges multi-criteria analysis with spatial data for planning public services. Similarly, Yildirim and Sisman (2025) employed GIS-MCDM within Spatial Decision Support to identify emergency gathering locations. The application of GIS-MCDM to various site selection issues further highlights the growing role of spatial data in decision-making (Shorabeh et al., 2022; Deveci et al., 2022). Nonetheless, GIS is typically used for spatial mapping and analysis in these studies, and the connection between specific ranking methods and location-based services requires further investigation.

The (Organization, Storage, and Synthesis of Relational Data (ORESTE) method is a multi-criteria decision-making (MCDM) method applicable for ranking purposes. According to Yerlikaya et al. (2023), ORESTE encounters challenges with preference structures when alternative sequences vary across multiple criteria. Subsequently, Wang et al. (2024) proposed a model based on ORESTE to enhance decision-making reliability. In another study, Shao et al. (2022) integrated an Improved ORESTE with GIS and MCDM to select offshore wind farm locations. This research indicates that while ORESTE is applicable to location selection issues, its use remains confined to the energy sector and has not yet been connected to location-based services (LBS) in telecommunication network planning.

Earlier research on ORESTE has largely focused on enhancing ranking methods and refining methodologies to boost decision-making reliability (Yerlikaya et al., 2023; Wang et al., 2024). Concurrently, GIS-MCDM studies have mainly utilized different decision-making approaches to assess location suitability across diverse application fields (Alkaradaghi et al., 2022; Yaman 2024). Although Spatial Decision Support Systems (SDSS) have proven the benefits of integrating multi-criteria analysis with spatial data (Krügel et al., 2024), the combination of ORESTE with Location-Based Services (LBS) for planning telecommunication infrastructure remains underexplored. Therefore, a decision-support system that merges ORESTE ordinal rankings with geographic coordinates and spatial visualization is required, allowing decision-makers to understand ranking results in their geographical context. This need is particularly pertinent for PT Foura Inti Sinergi, where the prioritization of Wi-Fi installation sites still heavily depends on field surveys and technical assessments. Practically, each potential site has unique attributes, such as proximity to the Optical Distribution Point (ODP), installation expenses, potential customer density, technician accessibility, and risk of network disruption, necessitating a systematic spatial multi-criteria decision framework that can integrate these varied factors into a clear and operationally significant prioritization process.

This study introduces an online Spatial Decision Support System (SDSS) that combines the ORESTE method with Location-Based Services (LBS) to determine the best sites for Wi-Fi installation. The ORESTE method produces alternative rankings using five evaluation criteria, whereas LBS connects these rankings to geographic locations through interactive spatial visualization. This framework merges ordinal multi-criteria evaluation with spatial representation based on location into a single decision-support process, allowing decision-makers to understand the ranking results within their geographical setting. This integration broadens the use of the SDSS in planning telecommunication infrastructure and highlights the practical benefits of merging MCDM with LBS to make spatially informed infrastructure decisions.

METHOD

This study employs a Research and Development (R&D) strategy to create a Spatial Decision Support System utilizing the oreste and LBS methods to prioritize WiFi installation sites at PT Foura Inti Sinergi. The software development process adheres to the waterfall model, encompassing stages such as needs analysis, design, implementation, testing, and maintenance (Badruzzaman et al., 2026). This model was selected because of its sequential execution, where the outcome of each phase serves as the foundation for the subsequent phase. Figure 1 illustrates the research flow.

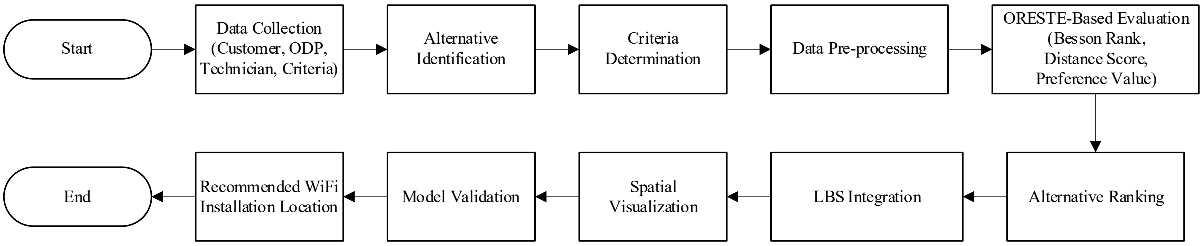

Figure 1. Research framework of proposed spatial decision support systems

Data for the research were gathered through observations, interviews, and company records. To gather insights into the process of selecting Wi-Fi installation sites, observations and interviews were conducted with operational coordinators, administrators, and technicians. The company's records served as secondary data, encompassing customer details, Optical Distribution Point (ODP) information, technician data, customer location coordinates, and installation history. Prior to processing, all data were verified to ensure they were complete and consistent.

The options comprised potential Wi-Fi installation sites within the operational region of PT Foura Inti Sinergi. Each option featured non-spatial attributes (such as customer details and field survey outcomes) and spatial attributes (latitude and longitude coordinates in the WGS84 format). The evaluation criteria were developed through a review of the literature, field observations, and Focus Group Discussions (FGDs) with operational coordinators, administrators, and technicians, leading to five criteria: proximity to the ODP (C1), installation expenses (C2), potential customer density (C3), technician accessibility (C4), and risk of network disruption (C5). All data were converted into ordinal values to align with the ORESTE method, and tied values were addressed using the Besson Rank procedure.

$$D(a, c_j) = \left[\frac{1}{2} rc_j^3 + \frac{1}{2} rc_j(a)^3\right]^{1/3} \tag{1}$$

Legend :

$\mathcal{D}(aj, cj)$	:	Distance Score
rcj	:	Besson – criteria of rank j
$rcj\ (a)$	:	Criteria for
R	:	Coefficient of calculation parameters (default = 3)

The ORESTE method involves several stages, starting with the creation of a decision matrix. Next, the Besson Rank is determined, followed by the computation of the Distance

Score, Preference Score, and ultimately, the Global Ranking, which represents the final ranking of the alternatives. Equation (1) is used to calculate the Distance Score. The ranking outcomes are then combined with location-based services (LBS) by associating the preference values with the geographic coordinates of each alternative. This integration enables the system to present prioritized locations directly on a digital map, allowing both analytical information and geographical positions to be viewed within a single interface.

The assessment involved comparing the system's calculated outcomes with both the manual calculations of the ORESTE method and the existing recommendations of the company. A sensitivity analysis was conducted to observe how rating changes occurred when the criterion values were altered. Additionally, Black Box Testing was employed to verify that data management functions, the OREST calculation process, LBS visualization, installation transactions, complaints, and reporting operated as intended. The system was developed using PHP, MySQL, Visual Studio Code, and XAMPP.

RESULTS AND DISCUSSION

Results

This study resulted in a web-based Spatial Decision Support System that integrates the ORESTE and location-based service (LBS) methods to determine the priority of Wi-Fi installation locations at PT Foura Inti Sinergi. The system evaluates each alternative based on five criteria: distance to the ODP, installation costs, potential customer density, ease of access for technicians, and potential network disruption. The five criteria are used simultaneously so that each alternative is assessed from technical, operational, and spatial perspectives. The orientation of each criterion is shown in Table 1 and is the basis for the ranking process using the OSESTE method.

Table 1. Criteria for determining wifi installation location

Code	Criteria	Orientation
C1	Distance to ODP	The smaller the better
C2	Installation Fee	The smaller the better
C3	Density of Potential Clients	The bigger the better
C4	Ease of Location Access	The easier the better
C5	Potential Network Disruption	The smaller the better

The alternative data used in this study were obtained from field surveys in the operational area of PT Foura Inti Sinergi. Each alternative has different values for the five criteria used, so they cannot be compared based on just one indicator. These differences in values show that each location has its own advantages and limitations in supporting network installation. This condition is the reason for using the ORESTE method to evaluate all alternatives simultaneously, so that a more representative order of priority is produced. The initial value of each alternative before the calculation process is presented in Table 2.

The values for each criterion were then converted into the Besson Rank as the basis for calculating the OSESTE method. The conversion results are presented in Table 3. This stage converts ordinal data into a sequence of preferences so that all alternatives can be compared without the normalization process. The smaller the ranking value, the better the conditions, according to the orientation of each criterion.

The Besson Rank values were then used to calculate the Distance Score, as presented in Table 4. The Distance Score represents the proximity of each alternative to the ideal position for every evaluation criterion. A smaller Distance Score indicates that an alternative is closer to the preferred condition, whereas a larger value indicates a lower level of suitability. These scores form the basis for calculating the preference values and determining the final rankings.

Therefore, the Distance Score plays an important role in distinguishing the priority level of each alternative in the ORESTE method.

Table 2. Alternative data and criterion values

Alternatives	Potential Customers	C1	C2	C3	C4	C5
A1	PL00001 – Yuda Amrullah	4	3	5	4	4
A2	PL00002 – Lamine Yamal	5	2	3	3	2
A3	PL00003 – Xabi Alonso	3	5	4	5	5
A4	PL00004 – Innocent	2	4	2	2	3
A5	PL00005 – Loftus	1	1	1	1	1

Table 3. Besson ranking results

Alternatives	Rank C1	C2 Rating	C3 Rating	C4 Rating	Rank C5
A1	2	3	1	2	2
A2	1	4	3	3	4
A3	3	1	2	1	1
A4	4	2	4	4	3
A5	5	5	5	5	5

Table 4. Distance score calculation results

Alternatives	D (C1)	D (C2)	D (C3)	D (C4)	D (C5)
A1	1.65	2.41	1.00	1.65	1.65
A2	1.00	3.19	2.41	2.41	3.19
A3	2.41	1.00	1.65	1.00	1.00
A4	3.19	1.65	3.19	3.19	2.41
A5	3.98	3.98	3.98	3.98	3.98

The final ranking results obtained using the ORESTE method are presented in Table 5. Alternative A3 achieved the lowest average preference value of 1.60, placing it in the first priority, while A5 obtained the highest value of 5.00 and ranked last. These results indicate that A3 has the most favorable combination of criterion values compared with the other alternatives. The ranking reflects the cumulative evaluation of all criteria, rather than the performance of a single indicator. Therefore, the ORESTE method provides a comprehensive priority order based on the overall preference values of each alternative.

Table 5. Oreste ranking final results

Alternatives	Summary	Average Preferences	Ratings
A3	8.0	1.60	1
A1	10.0	2.00	2
A2	15.0	3.00	3
A4	17.0	3.40	4
A5	25.0	5.00	5

The findings indicate that the distance to ODP (C1), potential network disruption (C5), and accessibility for technicians (C4) significantly impact changes in alternative positions. These criteria are closely linked to the simplicity of network construction and the quality of the service after installation. Conversely, when two or more options share nearly identical technical conditions, the density of potential customers (C3) plays a substantial role. Consequently, alterations in the values of C1, C4, or C5 are more likely to affect the ranking than changes in other criteria. Figure 2 illustrates the main interface of the system, which offers facilities for managing customer data, ODP information, the ORESTE calculation process, location visualization, and recommendation reports, enabling the entire process to be executed within a single application.

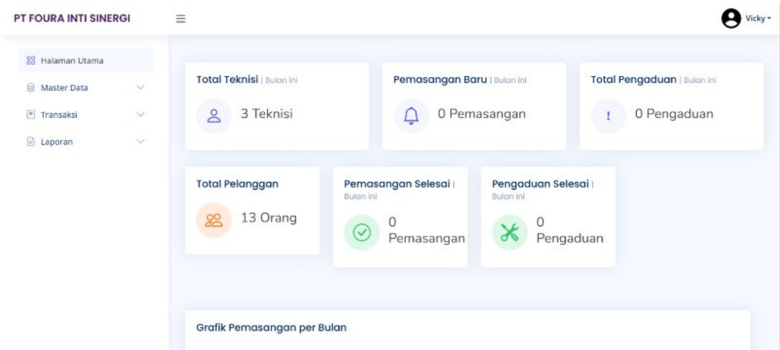

Figure 2. System dashboard view

Figure 3 illustrates the page that displays the calculation results. Once the calculation process is concluded, the system automatically presents the preference values, priority sequence, and supplementary details for each option. The results of the system perfectly matched the manual calculations using the ORESTE method, confirming that the algorithm's implementation aligned with the calculation procedure.

Figure 3. Display of oreste calculation results

Figure 4 illustrates spatial visualization using LBS technology. The map displays not only the customer's location and ODP points but also highlights the connection between ranking outcomes and the geographical conditions. Alternatives ranked higher typically have sites closer to the ODP and are more accessible to technicians. Conversely, those ranked lower were situated in more distant locations or in areas with a greater likelihood of network issues. The map format aids users in comprehending the distribution of priority locations, which a ranking table alone cannot convey.

The digital map illustrates the locations of customers and Optical Distribution Points (ODPs), enabling the interpretation of ranking outcomes alongside real-world field conditions. This visualization aids users in recognizing the spatial arrangement of priority sites and their proximity to the current network infrastructure. By integrating ranking outcomes with geographic data, a more thorough assessment can be facilitated during the planning phase. To ensure that all system functions performed as expected, functional testing was performed using the Black Box Testing approach. Table 6 summarizes the testing outcomes.

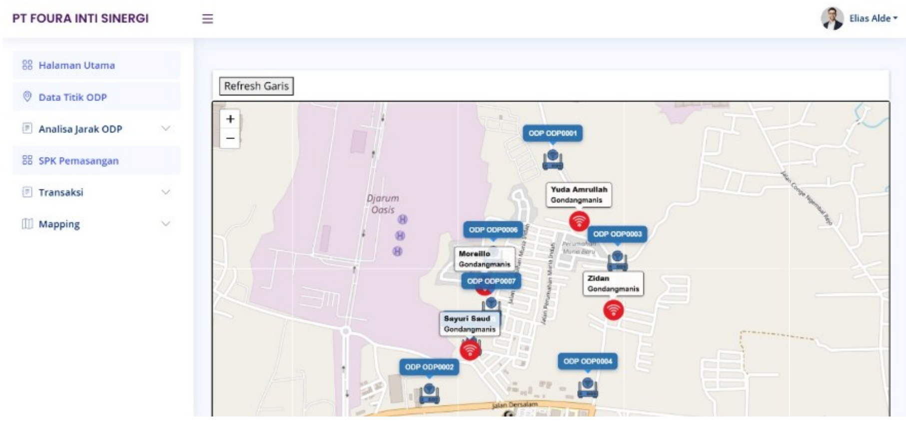

Figure 4. Visualization of location-based services

Table 6. Black box test results to verify the functionality of the decision support system

No	Modules	Number of Scenarios	Successful	Fail
1	Login	5	5	0
2	Manage User Data	6	6	0
3	Manage Customer Data	6	6	0
4	Manage ODP Data	5	5	0
5	ORESTE calculation	8	8	0
6	LBS visualization	5	5	0
7	Installation Transactions	5	5	0
8	Complaints	5	5	0
9	Reports	4	4	0

Evaluations were performed for 49 scenarios encompassing all primary functions of the system. Each scenario yielded results consistent with the design, achieving a 100% success rate in testing. These findings indicate that the processes for data management, OREST method calculations, LBS-based location visualization, installation transactions, handling complaints, and report generation can be executed without encountering any functional errors. Nonetheless, the success of this test serves as a verification of the software's implementation, while the quality of location recommendations is assessed based on the ORESTE model evaluation discussed earlier.

Discussion

The results indicate that prioritizing Wi-Fi installation cannot rely solely on one spatial characteristic, such as the distance to the Optical Distribution Point (ODP). Through ORESTE analysis, A3 emerged as the top priority with an average preference score of 1.60, followed by A1 (2.00), A2 (3.00), A4 (3.40), and A5 (5.00). A3 achieved the highest ranking owing to its overall performance in terms of installation cost, ease of technician access, and risk of network disruption, even though it did not have the best ODP proximity. This suggests that the suitability for installation is influenced by a combination of technical, operational, economic, and spatial factors, rather than a single element. Similar evidence from GIS–MCDM studies supports the notion that selecting infrastructure sites requires evaluating diverse criteria to determine alternatives (Yaman, 2024) and that spatial proximity alone is inadequate for making infrastructure-location decisions (Li et al., 2025).

The findings suggest the potential applications of ORESTE in planning telecommunications infrastructure. ORESTE assesses options using ordinal preference structures that organize criteria within a ranking system. Notably, preference values indicate relative rankings, not proportional differences in suitability. Consequently, interpreting the gap between A3 and A1 as a specific proportional advantage for A3, is incorrect. This distinction is crucial because the preference structure can influence the consistency and comparability of the ORESTE results. Yerlikaya et al. (2023) highlighted issues with preference structures in ORESTE when alternatives exhibit ordering patterns across criteria. Wang et al. (2024) showed that refining ORESTE's methodology may be necessary to enhance its reliability. The research supports ORESTE as a method for ordinal prioritization; however, its results should be viewed as preference-based rankings rather than assessments of infrastructure performance.

The integration of ORESTE with Location-Based Services (LBS) is the principal contribution of this study. ORESTE generates the priority order of candidate locations, whereas LBS links each priority to geographic coordinates, allowing decision-makers to interpret rankings in the spatial context. This is relevant to telecommunications infrastructure planning because a mathematically preferred alternative may still require consideration of accessibility, existing network infrastructure, customer distribution, and the field conditions. The resulting spatial representation provides information that is not fully conveyed by a conventional ranking table. Krügel et al. (2024) and Yildirim and Sisman (2025) similarly showed that integrating multi-criteria analysis with spatial information supports operationally interpretable, location-aware spatial decision-making for planning.

The sensitivity analysis revealed that the stability of the rankings differed among the alternatives. Alternatives with similar preference values were more prone to fluctuations in the criterion values, whereas those with distinct overall preferences generally retained their rankings. This implies that greater attention should be paid to uncertainty when candidate locations exhibit comparable suitability. Such sensitivity is significant in MCDM-based site selection because modifications in criteria or decision assumptions can shift the relative positions of competing alternatives, as shown in GIS–MCDM applications for infrastructure and energy site selection (Shao et al., 2022; Yaman, 2024). Therefore, the proposed ranking should be viewed as a structured decision-support tool, rather than a replacement for technical field evaluation. The system demonstrated a 100% success rate in 49 black-box testing scenarios, affirming the reliability of the software rather than the empirical validity of the suggested locations.

The scientific value of this research lies in transforming ordinal multicriteria ranking into a spatially explicit decision-support tool for planning telecommunications infrastructure, rather than introducing a new ORESTE algorithm. Prior research has shown ORESTE's effectiveness in prioritizing alternatives and enhancing methodologies (Yerlikaya et al., 2023; Wang et al., 2024), while GIS–MCDM studies have highlighted the benefits of integrating multicriteria evaluation with spatial data for site selection challenges (Shao et al., 2022; Yaman, 2024). This framework merges these areas by directly associating ORESTE preference rankings with geographic data via LBS, offering both analytical prioritization and spatial interpretation in a single decision-support system. However, the results are limited by the focus on a single company, five candidate options, five evaluation criteria, and data from a specific operational time frame. Several technically significant factors, such as ODP capacity, signal quality, bandwidth, latency, topography, and temporal changes in network demand were not included.

These constraints limit the external applicability of the results and suggest that future research should involve larger candidate pools, diverse operational areas, longitudinal datasets, and independent validation against real-world installation data. A comparative analysis with other MCDM methods and the inclusion of dynamic or uncertainty-aware spatial data would help assess whether the observed ranking remains stable under varying methodological assumptions and evolving telecommunication scenarios (Li et al., 2025). Future studies should test models in different regions, include more technical network criteria, update spatial data regularly, and compare ORESTE with other MCDM methods to pinpoint differences in ranking results.

CONCLUSION

This study led to the creation of a web-based Spatial Decision Support System that combines ORESTE and LBS to determine the best locations for Wi-Fi installation by evaluating multiple criteria and presenting alternative geographic sites. This combination extends ORESTE's use from merely ranking to being a component of spatial analysis, aiding in the advancement of location-based MCDM for planning telecommunications infrastructure and other applications. The model developed in this study is also applicable to other location-based infrastructure issues. However, this study is confined to a single operational area, considers a limited set of criteria, and does not include technical parameters such as ODP capacity, signal quality, bandwidth, latency, and topography. Future studies could explore a broader area, incorporate updated technical parameters and spatial data, and compare ORESTE with other MCDM techniques.

REFERENCES

Alkaradaghi, K., Hamamin, D., Karim, H., Al, N., Ali, S. S., Laue, J., & Ali, T. (2022). Geospatial Technique Integrated with MCDM Models for Selecting Potential Sites for Harvesting Rainwater in the Semi - arid Region. *Water, Air, & Soil Pollution*, 1–22. https://doi.org/10.1007/s11270-022-05796-2

Almasad, A., Pavlak, G., Alquthami, T., & Kumara, S. (2023). Site suitability Analysis For Implementing Solar PV Power Plants Using GIS and Fuzzy MCDM Based Approach. *Solar Energy*, *249*, 642–650. https://doi.org/10.1016/j.solener.2022.11.046

Armanuos, A. M., & Elgaafary, K. A. (2023). Landfill Site Selection using MCDM Methods and GIS in the Central Part of the Nile Delta , Egypt. *Environmental Monitoring and Assessment*, 1406–1432. https://doi.org/10.1007/s10661-023-11946-8

Badruzzaman, A. P., Irawan, Y., & Adiyono, S. (2026). An Integrated Safety Stock and Net Promoter Score System for Inventory and Customer Loyalty. *Edumatic : Jurnal Pendidikan Informatika*, *10*(1), 40–49. https://doi.org/10.29408/edumatic.v10i1.33557

Debnath, R. (2026). A GIS-Based Geospatial Risk Modeling Framework for Natural Gas Distribution Pipeline Infrastructure Integrity and Resilience. *Journal of Sustainable Development and Policy*, *5*(01), 01-33. https://doi.org/10.63125/6z18x885

Deveci, M., Pamucar, D., & Oguz, E. (2022). Floating photovoltaic site selection using fuzzy rough numbers based LAAW and RAFSI model. *Applied Energy*, *324*(August), 119597. https://doi.org/10.1016/j.apenergy.2022.119597

Feng, Z., Li, G., Wang, W., Zhang, L., Xiang, W., He, X., Zhang, M., & Wei, N. (2023). Emergency logistics centers site selection by multi-criteria decision-making and GIS. *International Journal of Disaster Risk Reduction*, *96*, 103921. https://doi.org/https://doi.org/10.1016/j.ijdrr.2023.103921

Fytya, Z., & Ratnawati, F. (2024). Sistem Pendukung Keputusan Penetapan Keringanan Uang Kuliah Tunggal Menggunakan Metode Oreste (Studi Kasus Politeknik Negeri Bengkalis). *JEKIN - Jurnal Teknik Informatika*, *5*(1), 50–60. https://doi.org/https://doi.org/10.58794/jekin.v5i1.912

Kazemi, F., & Hosseinpour, N. (2022). GIS-based land-use suitability analysis for urban agriculture development based on pollution distributions. *Land Use Policy*, *123*, 106426. https://doi.org/https://doi.org/10.1016/j.landusepol.2022.106426

Krishankumar, R., & Ecer, F. (2024). A multi-criteria framework for electric vehicle charging location selection using double hierarchy preferences and unknown weights. *Engineering Applications of Artificial Intelligence*, *133*, 108251.

https://doi.org/https://doi.org/10.1016/j.engappai.2024.108251
Krügel, F., Mäs, S., Hindorf, P., & Buthmann, E. (2024). An online multicriteria—spatial decision support system for public services planning. *Applied Sciences*, *14*(4), 1526. https://doi.org/10.3390/app14041526
Li, W., Samat, N., Tan, M. L., & Mahamud, M. A. (2025). Trends of GIS-based Multi-Criteria Decision-Making (GIS-MCDM) in site selection for electric vehicle charging stations: A bibliometric analysis. *Discover Sustainability*, *6*(1), 1366. https://doi.org/10.1007/s43621-025-02245-y
Manurung, R., & Sinaga, R. (2023). Sistem Pendukung Keputusan Penilaian Kepuasan Masyarakat Terhadap Pelayanan Pada CV. Glofacia Oceanic Menggunakan Metode Oreste. *Jurnal Sains Komputer Dan Sistem Informasi*, *1*(1), 1–7. https://doi.org/10.61674/jursakomsi.v1i1.1
Mubarok, A. Z., Supriyono, & Latifah, N. (2025). Decision Support System Internet Disruption Using ORESTE and Geolocation PT Cloud Solution. *Jurnal Teknologi Informasi Dan Pendidikan*, *18*(2), 915–927. https://doi.org/https://doi.org/10.24036/jtip.v18i2.980
Shao, M., Mao, Z., Sun, J., Guan, X., Shao, Z., & Tang, T. (2025). Multi-scale offshore wind farm site selection decision framework based on GIS, MCDM and meta-heuristic algorithm. *Ocean Engineering*, *316*, 119921. https://doi.org/https://doi.org/10.1016/j.oceaneng.2024.119921
Shao, M., Zhang, S., Sun, J., Han, Z., Shao, Z., & Yi, C. (2022). GIS-MCDM-based approach to site selection of wave power plants for islands in China. *Energies*, *15*(11), 4118. https://doi.org/10.3390/en15114118
Shorabeh, S. N., Firozjaei, H. K., Firozjaei, M. K., Jelokhani-Niaraki, M., Homaee, M., & Nematollahi, O. (2022). The site selection of wind energy power plant using GIS-multi-criteria evaluation from economic perspectives. *Renewable and Sustainable Energy Reviews*, *168*, 112778. https://doi.org/https://doi.org/10.1016/j.rser.2022.112778
Terzi, F., Atasoy, B. A., Yildirim, V., Uzun, B., Memisoglu Baykal, T., & Uzun, S. (2025). Filling Station Site Selection with GIS and MCDM for Planning Studies: A Case of Trabzon, Türkiye. *Applied Spatial Analysis and Policy*, *18*(4), 140. https://doi.org/10.1007/s12061-025-09742-7
Wang, X., Hou, B., Teng, Y., Yang, Y., Zhang, X., Sun, L., & Chen, F. (2024). Reformative ROCOSD–ORESTE–LDA model with an MLP neural network to enhance decision reliability. *Knowledge-Based Systems*, *286*, 111384. https://doi.org/https://doi.org/10.1016/j.knosys.2024.111384
Yaman, A. (2024). A GIS - based multi - criteria decision - making approach (GIS - MCDM) for determination of the most appropriate site selection of onshore wind farm in Adana , Turkey. *Clean Technologies and Environmental Policy*, *26*(12), 4231–4254. https://doi.org/10.1007/s10098-024-02866-3
Yerlikaya, M. A., Yildiz, K., & Keskin, B. N. (2023). Solution proposal for completed preference structure in ORESTE method. *Scientific Reports*, 1–12. https://doi.org/10.1038/s41598-023-31561-4
Yildirim, R. E., & Sisman, A. (2025). Spatial decision support for determining suitable emergency assembly places using GIS and MCDM techniques. *Sustainability*, *17*(5), 2144. https://doi.org/10.3390/su17052144