DOI: http://doi.org/10.46632/jemm/8/3/10

REST Journal on Emerging trends in Modelling and Manufacturing
Vol: 8(3), 2022
REST Publisher; ISSN: 2455-4537
Website: http://restpublisher.com/journals/jemm/

Identification and Review of Sensitivity Analysis Using Fuzzy ARAS Method

*Sathiyaraj Chinnasamy, M. Ramachandran, Prabakaran Nanjundan
REST Labs, Kaveripattinam, Krishnagiri, Tamil Nadu, India
*Corresponding author Email: sathiyarajrsri@gmail.com

Abstract: It is a way to predict a given outcome variables. Others variables that determine how sensitive variables are affected are the target based on changes in the financial model. Analysis is based on so-called input variables. 'Sensitivity analysis is it is a comparison of the sales results of advertisements to see How can uncertainty in model input be shared by different sources of uncertainty in model output. That differ only in the presence or absence of certain information included. Defined as sensitivity analysis (SA). “A method of determining the strength of an estimate by examining the extent to which results are affected by methods, models, values of unmeasured variables or assumptions with the aim of identifying the results". Alternative values for the first and last value of these values are determined using the ARAS method of bias sensitivity analysis of suspicious or helpless individuals basically how the target variables affect the deterministic financial model. By changes in other variables called input variables. Sensitivity analysis using Fuzzy ARAS method is a method of predicting the outcome if a scenario is different compared to the main prediction. It helps in assessing the risk of a strategy. It helps to find out how much the output depends on a particular input value. According to pollution level the unreliable camera (A1) is in 1st rank, camera (A2) is on 3rd rank, camera (A3) is on 2nd rank. As a result, unreliability review A1 camera is ranked first, where batch arrival review A3 camera is ranked lowest.

1. Introduction

Comparative analysis of decision-making methods to validate a novel image blurring ARAS method, a current fuzzy multicriterion of nine state-of-the-art images presented. However, ARAS condemns the proposed picture as a generic and usable method anyone else, taking ARAS is provided Comparative analysis of Spearman's rank correlation coefficients for novel images to verify structure. Finally, nine will be announced Current of MCTM with cutting-edge images methods is calculated to verify consistency developed image Ambiguous ARAS pattern and available PFS. -based MCDM methods. Combined Green combined the Nguyen A fuzzy AHP-ARAS approach is applied to the supplier selection problem. Insights from the FDC test at a tire manufacturing company in the Czech Republic, Insights into the Designed Method This paper presents a new image this is confirmed by comparison with existing state-of-the-art image-fuzzy-based MCDM methods Fuzzy ARAS method. It is very reliable and accurate. Then, based on these input criteria on the results of applying it HPWS procedures Ranking was done using Fuzzy ARAS method are that structural top management support for SMEs in Nanotechnology Sector in Iran The most important input criteria for innovation and funding decisions Analytical methods were identified. Identify critical control points, prioritize and validate Also check a sample additional data collection or research, Can be used to assess sensitivity. Here, the focus is on sensitivity analysis techniques. A mathematical method, nominal threshold sensitivity, is additionally used. For example, an analyst may perform a substantive analysis, basic modeling techniques. The increase in the temperature of the air in the fan leads to four different phenomena. A sensitivity analysis was performed at baseline. Two and two different assumptions regarding ventilation rate.

2. FUZZY ARAS

Czech Republic is a case-based tire manufacturing company study illustrates the Generic and can be used by any other organization. Implementation of the proposed method. A Performance of Lithuanian economic unit in busy government survey [1]. Comparative analysis with nine existing state-of-the-art films To validate the novel image blurring ARAS method, deploring multivariate decision methods is presented determine the Appropriate construction technology So much for installing pile-columns[2]. "Freight Distribution by 3PL" Best inventory distribution concept for tire manufacturing company. According to the proposed ARAS image clarification method, choosing the object distribution concept to validate the ARAS method for blurring the generated image solves the validation problem in all to rank the companies based on best financial performance. Two fuzzy MCDM methods were used for the evaluation of twenty-four firms in this study [3]. Originally FAHP Key criteria and sub-criteria previous research, decision-making A comparison of results and findings among four other multi-attribute decision makers (MADM) sensitivity analysis and proposed methods framework Final ranking procedures and significance criteria show Findings and ensuring credibility. For this purpose, epiphysis the kings weight of inch scales on the Final ranking of Fuzzy ARAS method is analyzed separately [4]. It is successfully used in many

Sectors like sustainable development and construction. Transport, Economy, Technology, and Fuzzy ARAS provides a unified MCDM framework that includes methods. Fuzzy AHP for Evaluation and Selection of Conveyors and Consequently, Optimal fields is the main objective of this research. The best care is selected using strategy feedback from maintenance experts and Fuzzy ARAS[5]. The 1st and 2nd confirmatory factor analysis identified the most important subscales, then Ambiguous ARAS and ambiguous maintenance strategies were evaluated using a Technique like ANP. Fuzzy ARAS multidimensional decision making process is used in this research various maintenance strategies should be prioritized in an oil refinery [6]. The first step in solving a multifaceted Forming a decision-making team is a decision-making problem. Regarding this, the fuzzy ARAS integral technique is introduced below. Expert opinions and familiarity with various strategies in selecting care strategies were collected from 10 maintenance experts and used to prioritize strategies.

3. Sensitivity Analysis

Sensitivity analysis is important for validating the model, prioritizing four mathematical methods, five statistical and control points are additional data collection or research. Sensitivity analysis methods were identified, including ten methods and graphical methods [1]. The methods chosen the sensitivity and specificity of these methods require preliminary data and the complexity of their application are compared based on their applicability to such computational problems. The Review and Evaluation To identify the objectives of this thesis, common risk assessment models and applicable sensitivity analysis methods used or expected to be used in the future for food-safety risk assessment. Promotes the need for sensitivity analysis and face-to-face or sensitivity analysis [2]. Here, the focus is on sensitivity analysis techniques used in addition to basic modeling techniques. For example, an analyst may perform substantive analysis in which a mathematical method, such as nominal threshold sensitivity, may be used to estimate sensitivity [3]. They acknowledge the Model-based The Importance of Careful Sensitivity Analysis of Inference." The variables you analyze in sensitivity analysis can be used to examine outcomes [4]." holding all others constant. Regarding the A relatively complex crop model described in Varella. Another good example of global sensitivity analysis is when you analyze the effects of choices on variables. Looking for the most influential model input factors; however, no analysis limited to OAT's inadequacy sensitivity analysis, is inconclusive Thus the sensitivity analysis of the designed OAT can be performed in a sample free setting. Model parameters that are most influential Model results are identified through 'sensitivity analysis'. In As discussed in the previous section, differential-based Si and SiTi are candidate best practices for high-dimensional space, while derivative-based analysis and OAT-based are practically equivalent for sensitivity analysis [5]. Detailed reviews of over a dozen sensitivity analysis methods are presented. Some Current sensitivity analysis techniques in the literature involve very complex or very large samples and are discussed below. Differential analysis, also referred to as the direct method, the backbone that is discussed first [6]. It is sensitive to all other analytical techniques. Direct sensitivity analysis calculates partial derivatives of the model for each input parameter. The most basic of the sensing techniques is the direct method. Capalto and Bandis's sensitivity analysis, Subjectivity of We highlight an important step for meaningful sensitivity analysis of many studies, analysis is a sensitivity analysis method that allows self-verification When the analyst estimates or measures the error of the analysis directly from its results, it is a We want a clear statement of insights from the model [7]. This constitutes a vast and growing literature. The second entry analyzes a point of interest in masala; We systematically examine commonly asked questions in the Probabilistic and several sensitivity analysis methods have been developed, literature. We provide an overview of available methods, classifying them into local and global methods. significant simplification of sensitivity analysis can be obtained by increasing the function of its arguments to the classical assumption of monotonicity. Many proposed details cannot be entered into screening designs. It is worth noting that arguments have been made for and against assigning probability distributions[8]. In this way, many authors for sensitivity analysis When the running time of the model is very large, sensitivity analysis becomes problematic. In these cases, an analyst may resort to a time-consuming approach such as automated differentiation. In this case, the analyst can intervene in the code that implements the method to efficiently calculate the structure of a part. This work illustrates best practices for conducting sensitivity analysis for environmental models. The characteristics of the proposed methods and their applicability limits are illustrated through sensitivity analysis techniques for two test cases [9]. In an attempt To assess the effectiveness and relevance of SA within the modeling process, we examine the tasks sensitivity analysis (SA) can perform. We review some new global quantitative SA methods and suggest that these are computational and statistical, and the scope of sensitivity analysis can be extended to modeling practice [10]. When dealing Uncertain or competing model with structured or views; sensitivity analysis sampling selection is one of the sources of uncertainty that can be used when considering although some general conclusions about the application of global quantitative sensitivity analysis have been presented so far, the purpose of this section is to see if we can draw inferences from the examples. Conversely, a sample General evidence can be presented to defend or refute a thesis. In this context, sensitivity analysis is seen as an important component of evidence generation[11]. A functional coordinate system based on appropriate basis functions, through sensitivity analysis of expansion coefficients using any standard method. Exit by expanding the function output appropriately. The purpose of this paper is functional computer modeling to provide sensitivity analysis for outputs that, if done correctly, are more difficult to measure than outputs [12]. Sensitivity analysis of expansion coefficients using any standard method. Overloading task although we discuss them because they are mostly obvious. Something too extreme Problems with Legendre polynomials, for sensitivity analysis, we repeat the above outlier adjustment procedure using other plausible values for prevalence and confounding effect. Sensitivity analysis can be extended by scaling the results. To generate evidence of because the Sensitivity analysis is used [13]. E value statement or some other Therefore, the key art is to choose an appropriate coordinate system. The authors propose that all observational

studies should be objective. Validation methods allow sensitivity analysis to see the impact of deviations from validation study results even when internal validation data are available. Covers a wide range of possibilities Different values of Se and Sp are used for cases and non-cases. The results of repeated application of this procedure to different pairs of Se, Sp can be tabulated to provide a sensitivity analysis [14].

Quantitative elaboration of qualitative assumptions characterizes good discussions of research results. Section 4 deals with sensitivity in our discussion and briefly touches on the role of analysis. Otherwise, a sensitivity analysis based on Equation 10 should be performed. In this regard, it can be considered as an attempt to bridge the gap between conventional statistical sensitivity analysis, We first provide some pointers and initially discuss the origins Briefly comment on Sensitivity analysis on validation and inventory sensitivity analysis on reliability activities. Section 5 concludes the article. We have tried to provide the package of useful tips the quantitative emphasis seen In the notes above. Sensitivity analysis is key to validation and supports this idea by iteratively improving our quantitative understanding of what priorities should look like. established over time. Considers possible effects of Simultaneous variation of Sampling inputs within the range of uncertainty[15].There are several techniques for this performing Global sensitivity analysis predictions on model inputs This is a study of how uncertainty is determined. Universal sensitivity analyzes and their limitations. Uncertainty in Model development and application and sensitivity analysis process serve many useful purposes. Advantages include: no assumptions are made about model behavior; first- and higher-order effects can be calculated and analyzed in a variety of sensitivity analysis techniques, only some of which are suitable for spatial models. Sobol' approach and related extensions are used in the spatial context are particularly noteworthy [16]. There are also several practical problems with using sensitivity analysis. Determining input variables, the choice of generating energy schemes and How to reduce the computational time for energy models is also discussed. Second, sensitivity analysis methods are used. Building performance analysis is reviewed. Intervals for Sensitivity indices from sensitivity analysis are robust from sensitivity analysis displaying the results of sensitivity analysis compared to point values [17]. All design sensitivity analysis Calculate the derivatives of the corresponding system response quantities as design variables for optimization methods. Play an important role in structural optimization. Component judgment that confirms or falsifies scientific hypotheses embedded in a model. The moves seamlessly from the previous one using the same design and model [18]. Additionally, Sensitivity analysis is valuable as a guide for experimental analysis, model reduction, and parameter estimation. Local and global sensitivity analysis approaches two types of sensitivity analysis and global sensitivity analysis the other side approaches. For this reason, a large number of global sensitivity analysis approaches require model input parameters used to measure sensitivity to variations in model outputs. The Sensitivity analysis is used to define experimental strategies and allows researchers to increase reliability [19]. replay on sensitivity analysis package is needed. The choice of analysis technique depends on the system under consideration and precisely what information is needed. However, sensitivity is generally not program specific and to identify outliers and erroneous data, Note that this result is not so clear-cut, this results from the Due to the inadequacy of sensitive mathematical foundations. Primarily a failure to realize and use the full potential of sensitivity analysis, an inadequacy of mathematics. Sensitivity and additional research needs have been identified [20]. Provides better understanding how models work. A primary drawback of sensitivity analysis is that sensitivity is an elaborate mathematical construct is explored.

4. Result& discussion

TABLE 1. Alternative factors

A1	camera
A2	camera
A3	camera

TABLE 2. parameter factors

C1	picture
C2	Cost
C3	Zoom
C4	Battery

Table 1 and 2 shows in alternative values and parameter factors

TABLE 3. Criterion Weights

Criterion Weights	
Medium	(0.4,0.6,0.8)
High	(0.6,0.5,2.0)
Very High	(0.8,2.0,3.0)

Table 3 shows the scale value of Medium, High, Very High stands for fair.

TABLE 4. Formula for criterion weight

	C1	C2	C3	C4
A1	M	H	H	VH
A2	H	M	VH	H
A3	VH	M	H	H

Table 4 above shows the code for C1, C2, C3, C4. The column of each criterion index is modified to the value of Table 1 above each column of Table 2. Here C1 stands for picture, C2 stands for Random Cost, C3 stands for Zoom, C4 stands for Battery.

TABLE 5. solved value of l', l, m, u', u

l	l'	m	u'	u
0.4	0.5769	0.843433	1.686865	3
0.4	0.524148	0.531329	1.473613	2
0.6	0.660385	0.793701	2.289428	3
0.4	0.457886	0.564622	1.085767	2

Table 5 shows the value that the table 1 substituted in table 2. The **l** column mentions that minimum of first value of all the criterion weight which the value substituted in the table 2. As same as the **l'** mention cube root of product of the first value substituted in the table 2. **m** mentions the cube root of product of the second value substituted in the table 2. **u'** mention the cube root of product of the third value. **u** mention that maximum of third value of all the criterion weight which the value substituted in the table 2.

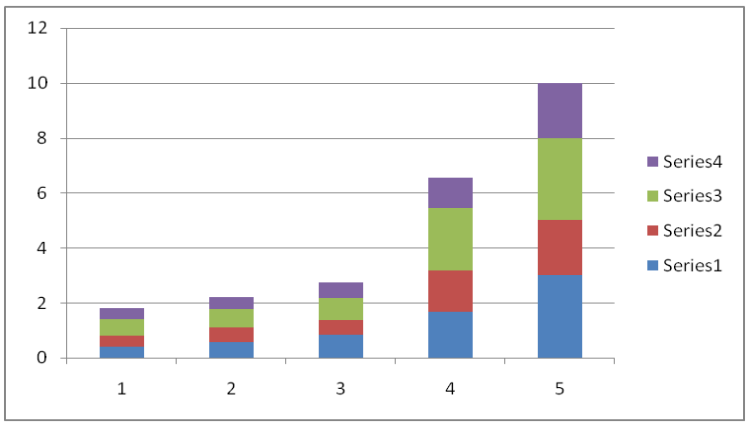

FIGURE 1. Criterion Weights

Figure 1 shows the pictorial representation of the Table 5. It shows that the all the u in C1,C3, has the same value 1& C2,C4 has the same value 1.

TABLE 6. Performance rating

Performance Rating	
MG	0.5,0.7,0.9
G	(0.6,0.5,2.0)
VG	(0.8,2.0,3.0)
F	(0.4,0.6,0.8)

Table 6 shows the performance rating of F, MG, G, and VG. F represent Fair, MG stands for medium good, G stands for good, VG stands for very good. All the above value mentions the rating of the performance.

TABLE 7. Number for place which represent the column and row of the above tabulation

Optimal	**C1**	**C2**	**C3**	**C4**
A1	1,1	1,2	1,3	1,4
A2	2,1	2,2	2,3	2,4
A3	3,1	3,2	3,3	3,4

Table 7 shows the number of the place which represents the column and row of the above tabulation.

TABLE 8. Formula to calculate the Performance rating

	C1	C2	C3	C4
A1	MG, G,VG	F,MG,G	MG,VG,F	F,MG,VG
A2	F,VG,MG	G,MG,VG	VG,MG,G	VG,MG,G
A3	F,G,MG	MG,VG,G	VG,G,MG	MG,G,F

Table 8 represent the formula for each box in the table by substituting the table 5 value in table 6 .By continuing this process for each row and column the next value will be found.

TABLE 9. solved value of l', l, m, u', u for Performance rating

1,1	0.5	0.621447	0.887904	1.754411	3
1,2	0.5	0.68399	1.40946	2.008299	3
1,3	0.5	0.564622	0.559344	1.532619	2
1,4	0.5	0.68399	1.40946	2.008299	3
2,1	0.8	0.8	2	3	3
2,2	0.5	0.531329	0.625732	1.17446	2
2,3	0.5	0.584804	0.993288	1.344421	3
2,4	0.5	0.564622	0.559344	1.532619	2
3,1	0.5	0.621447	0.887904	1.754411	3
3,2	0.5	0.621447	0.887904	1.754411	3
3,3	0.4	0.493242	0.594392	1.129243	2
3,4	0.6	0.660385	0.793701	2.289428	3

Table 9 shows the value that the table 5 substituted in table 6. The **l** column mentions that minimum of first value of all the criterion weight which the value substituted in the table 6. As same as the **l'** mention cube root of product of the first value substituted in the table 6. **m** mentions the cube root of product of the second value substituted in the table 6. **u'** mention the cube root of product of the third value. **u** mention that maximum of third value of all the criterion weight which the value substituted in the table 6.

TABLE 10. sum of solved value of l', l, m, u', u

A01	0.8	0.8	2	3
A02	0.5	0.68399	1.40946	2.008299
A03	0.5	0.584804	0.993288	1.532619
A04	0.6	0.68399	1.40946	2.289428

Table 10 shows the Maximum of each box with respect to the table 5. The maximum of all row and column are considered.

TABLE 11. Normalized Matrix C4

A0	0.6	0.68399	1.40946	2.289428	3
M1	0.5	0.68399	1.40946	2.008299	3
M2	0.5	0.564622	0.559344	1.532619	2
M3	0.6	0.660385	0.793701	2.289428	3

Table 11 shows the Normalized matrix of C4. In Normalized matrix the sum of u of the C8, this sum is divided for each value normalized matrix this process is continues for all other C1,C2,C3. From the normalized matrix is calculated by the A weighted normalized matrix.

TABLE 12. The weighted normalized matrix C1

A0	0.06	0.078297	0.198953	0.621447	1.5
M1	0.05	0.078297	0.198953	0.545136	1.5
M2	0.05	0.064633	0.078954	0.416017	1
M3	0.06	0.075595	0.112035	0.621447	1.5

Table 12 represents the value calculation of the c1 from all the other calculation done on the above. It shows the weighted normalized matrix of C1 which represent Economic distribution.

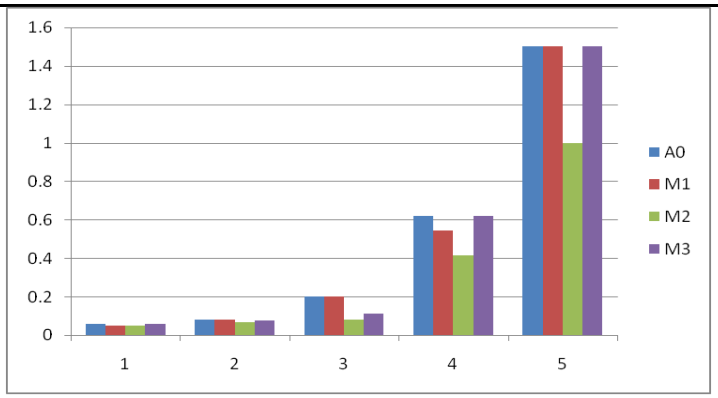

FIGURE 2. The weighted normalized matrix C1

In Figure 3 the series 1 represent the **l**, the series 2 represent **l', the** series 3 represent the **m** , the series 4 represent the **u'** , the series 5 represent **u**. the u line lies in the same value 1. Series 1 is low when compare to all others. the u line lies in the same value 1. Series 1 is low when compare to all others.

TABLE 13. The weighted normalized matrix C2

A0	0.06	0.078297	0.198953	0.621447	1.5
M1	0.05	0.078297	0.198953	0.545136	1.5
M2	0.05	0.060822	0.088326	0.318798	1
M3	0.05	0.071138	0.125332	0.47622	1.5

Table 13 represents the value calculation of the C2from all the other calculation done on the above. It shows the weighted normalized matrix of C2 which represent social distribution.

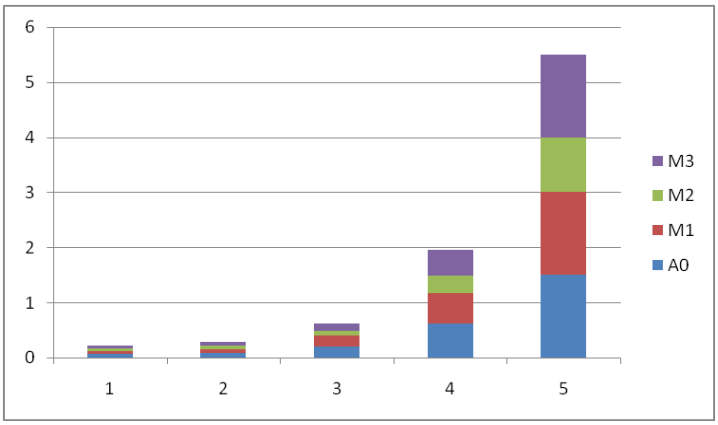

FIGURE 3. Weighted normalized matrix C2

In Figure 4 the series 1 represent the **l**, the series 2 represent **l',** the series 3 represent the **m** , the series 4 represent the **u'** , theseries 5 represent **u**. the u line lies in the same value 1. Series 1 is low when compare to all others. the u line lies in the same value 1. Series 5 is high when compare to all others.

TABLE 14. weighted normalized matrix C3

A0	0.06	0.078297	0.198953	0.621447	1.5
M1	0.05	0.064633	0.078954	0.416017	1
M2	0.05	0.066943	0.140208	0.364932	1.5
M3	0.04	0.056462	0.083902	0.306524	1

Table 14 represents the value calculation of the C3 from all the other calculation done on the above. It shows the weighted normalized matrix of C3 which represent air pollution.

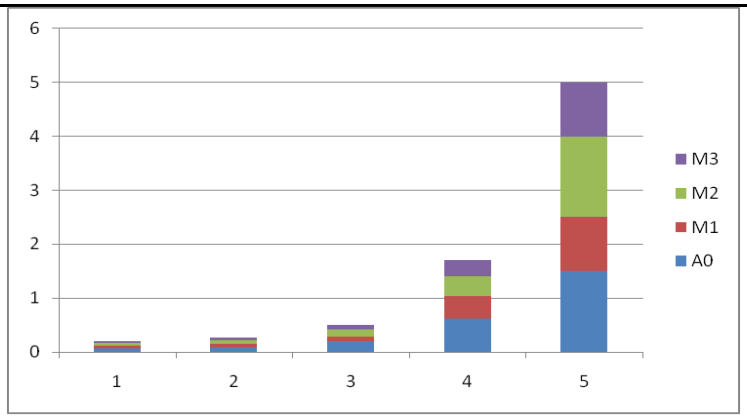

FIGURE 4. Weighted normalized matrix C3

In Figure 5 the series 1 represent the **l**, the series 2 represent **l',** the series 3 represent the **m,** the series 4 represent the **u',** theseries 5 represent **u**. the u line lies in the same value 1. Series 1 is low when compare to all others. the u line lies in the same value 1. Series 1 is low when comparing to all others and series 5 is high.

TABLE 15.weighted normalized matrix C4

A0	0.06	0.078297	0.198953	0.621447	1.5
M1	0.05	0.078297	0.198953	0.545136	1.5
M2	0.05	0.064633	0.078954	0.416017	1
M3	0.06	0.075595	0.112035	0.621447	1.5

Table 15 represents the value calculation of the C4 from all the other calculation done on the above. It shows the weighted normalized matrix of C4 which represent water pollution.

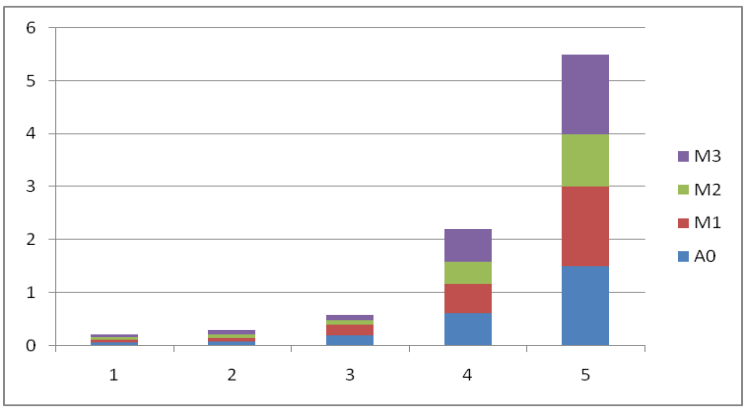

FIGURE 5.weighted normalized matrix C4

In Figure 6 the series 1 represent the **l**, the series 2 represent **l',** the series 3 represent the **m,** the series 4 represent the **u',** the series 5 represent **u**. the u line lies in the same value 1. Series 1 is low when compare to all others. The u line lies in the same value 1. Series 1 is low when comparing to all others and series 5 is high.

TABLE 16. Sum of all weighted normalized matrix

	Si				
A0	0.24	0.313189	0.795811	2.485786	6
M1	0.2	0.299525	0.675813	2.051425	5.5
M2	0.2	0.257031	0.386443	1.515763	4.5
M3	0.21	0.278791	0.433304	2.025637	5.5

Table 16 shows the sum of all C1, C2, C3, C4 of all weighted normalized matrix with respect to all rows and column of each and every box in the tabulation. The M value show in the above table is taken from C*A which has been shown in the Table 6, Table 6 represent the formula for each box in the table by substituting the table 5 value in table 6.

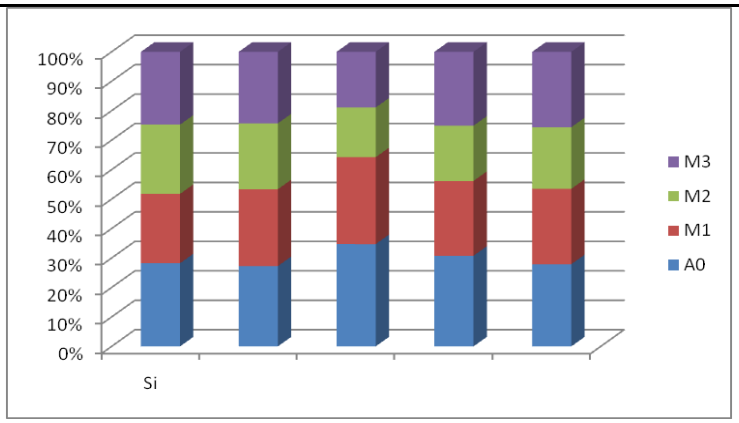

FIGURE 6. Sum of all weighted normalized matrix

Figure 11 shows the sum of all weighted normalized matrices, which is a pictorial representation to show the simple way of all c1 to c4.

TABLE 17. Si, Qi

Si	Qi	Rank	
1.966957	1		
1.745353	0.887336	1	M1
1.371847	0.697446	3	M2
1.689546	0.858964	2	M3

Table 17 shows the sum of the table 18 which is divided by five to give the rank of the all Si. The M2 is in the first rank and the M1 is on the last rank.

TABLE 18. Rank

M1	1	camera
M2	3	camera
M3	2	camera

Table 18 shows that the rank depends on the pollution. According to pollution level the unreliable camera (A1) is in 1st rank, camera(A2) is on 3rd rank, camera(A3) is on 2nd rank.

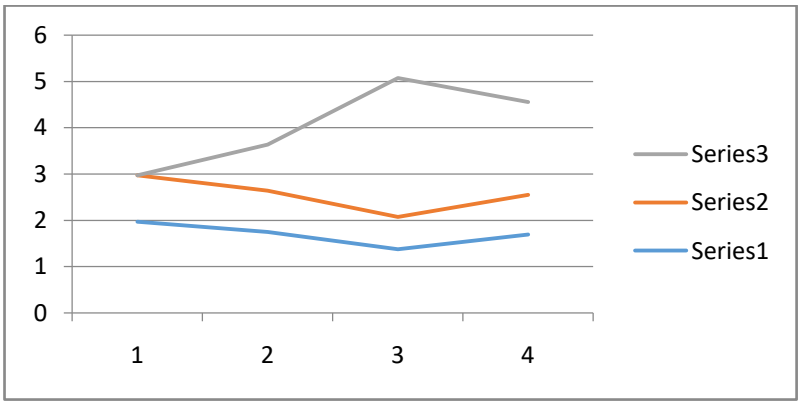

FIGURE 7. Shown in Rank

Figure 7 shows that the rank depends on the pollution. According to pollution level the unreliable camera (A1) is in 1st rank, camera (A2) is on 3rd rank.

5. Conclusion

Sensitivity analysis is one of the tools that can help decision makers do more than solve a problem. This provides relevant Insights into the issues. The financial model is related to the model under reference determines that. It is a way to predict the outcome of a given set of variables. Sensitivity analysis is how target variables are affected based on changes in other variables called input variables. Zavadskas adopted the ARAS method to determine The most suitable construction technology for the installation of pile-columns. According to the proposed image clarification ARAS method, Fuzzy ARAS Method for Performance Comparison of Lithuanian Economic Sectors Dadello used the ARAS method to solve the problem

of employee selection. “Logistics through 3PL” means tire manufacturing which A better logistics concept for the company. According to pollution level the unreliable camera (A1) is in 1st rank, camera (A2) is on 3rd rank, camera (A3) is on 2nd rank.

References

[1]. Jovcic, Stefan, Vladimir Simic, Petr Prusa, and Momcilo Dobrodolac. "Picture fuzzy ARAS method for freight distribution concept selection." SYMMETRY-BASEL 12, no. 7 (2020).

[2]. Ghadikolaei, Abdolhamid Safaei, and Saber Khalili Esbouei. "Integrating Fuzzy AHP and Fuzzy ARAS for evaluating financial performance." Boletim da Sociedade Paranaense de Matemática 32, no. 2 (2014): 163-174.

[3]. Heidary Dahooie, Jalil, Mehrdad Estiri, Edmundas Kazimieras Zavadskas, and Zeshui Xu. "A novel hybrid Fuzzy DEA-Fuzzy ARAS method for prioritizing high-performance innovation-oriented human resource practices in high tech SME’s." International Journal of Fuzzy Systems 24, no. 2 (2022): 883-908.

[4]. Chaudhari, R., P. K. Loharkar, and A. Ingle. "Applications and challenges of arc welding methods in dissimilar metal joining." In IOP Conference Series: Materials Science and Engineering, vol. 810, no. 1, p. 012006. IOP Publishing, 2020.

[5]. Bajaj, Karan, Bhisham Sharma, and Raman Singh. "Implementation analysis of IoT-based offloading frameworks on cloud/edge computing for sensor generated big data." Complex & Intelligent Systems 8, no. 5 (2022): 3641-3658.

[6]. Büyüközkan, Gülçin, and Fethullah Göçer. "An extension of ARAS methodology under interval valued intuitionistic fuzzy environment for digital supply chain." Applied Soft Computing 69 (2018): 634-654.

[7]. Khanaposhtani, Habib Farajpoor, Mohsen Shafiei Nikabadi, Hossein Eftekhari, and Alireza Aslani. "A new decision making model based on factor analysis (FA), F-ANP, and F-ARAS for selecting and ranking maintenance strategies." International Journal of Business Analytics (IJBAN) 3, no. 4 (2016): 41-63.

[8]. Farooqui, Nafees Akhter, Amit Kumar Mishra, and Ritika Mehra. "Automatic crop disease recognition by improved abnormality segmentation along with heuristic-based concatenated deep learning model." Intelligent Decision Technologies Preprint (2022): 1-23.

[9]. Christopher Frey, H., and Sumeet R. Patil. "Identification and review of sensitivity analysis methods." Risk analysis 22, no. 3 (2002): 553-578.

[10]. Chaudhari, Rakesh, Asha Ingle, and Kanak Kalita. "Stress analysis of dissimilar metal weld between carbon steel and stainless steel formed by transition grading technique." Materials Today: Proceedings 2, no. 4-5 (2015): 1657-1664.

[11]. Tortorelli, Daniel A., and Panagiotis Michaleris. "Design sensitivity analysis: overview and review." Inverse problems in Engineering 1, no. 1 (1994): 71-105.

[12]. Koundal, Deepika, and Bhisham Sharma. "Advanced neutrosophic set-based ultrasound image analysis." In Neutrosophic set in medical image analysis, pp. 51-73. Academic Press, 2019.

[13]. Saltelli, Andrea. "Sensitivity analysis for importance assessment." Risk analysis 22, no. 3 (2002): 579-590.

[14]. Lenhart, T., K. Eckhardt, N. Fohrer, and H-G. Frede. "Comparison of two different approaches of sensitivity analysis." Physics and Chemistry of the Earth, Parts A/B/C 27, no. 9-10 (2002): 645-654.

[15]. Mishra, Amit Kumar, and Shweta Paliwal. "Mitigating cyber threats through integration of feature selection and stacking ensemble learning: the LGBM and random forest intrusion detection perspective." Cluster Computing (2022): 1-12.

[16]. Saltelli, Andrea, and Paola Annoni. "How to avoid a perfunctory sensitivity analysis." Environmental Modelling & Software 25, no. 12 (2010): 1508-1517.

[17]. C. Sukumaran; M. Ramachandran; Vimala Saravanan; Sathiyaraj Chinnasamy, “An Empirical Study of Brand Marketing Using TOPSIS MCDM Method”, REST Journal on Banking, Accounting and Business, 1(1), (2022):10-18.

[18]. Kalita, Kanak, Rakesh Chaudhari, and M. Ramachandran. "Mechanical characterization and finite element investigation on properties of PLA-jute composite." International Journal of Computer Applications 123, no. 13 (2015).

[19]. Hamby, David M. "A review of techniques for parameter sensitivity analysis of environmental models." Environmental monitoring and assessment 32, no. 2 (1994): 135-154.

[20]. Saltelli, Andrea. "Sensitivity analysis: Could better methods be used?." Journal of Geophysical Research: Atmospheres 104, no. D3 (1999): 3789-3793.

[21]. Borgonovo, Emanuele, and Elmar Plischke. "Sensitivity analysis: a review of recent advances." European Journal of Operational Research 248, no. 3 (2016): 869-887.

[22]. Garg, Sheetal, Raman Singh, Mohammad S. Obaidat, Vinod Kumar Bhalla, and Bhisham Sharma. "Statistical vertical reduction-based data abridging technique for big network traffic dataset." International Journal of Communication Systems 33, no. 4 (2020): e4249.

[23]. Farooqui, Nafees Akhter, Amit Kumar Mishra, and Ritika Mehra. "Concatenated deep features with modified LSTM for enhanced crop disease classification." International Journal of Intelligent Robotics and Applications (2022): 1-25.

[24]. Wang, Xin, Yuhao Zhou, Tingwen Huang, and Prasun Chakrabarti. "Event-triggered Adaptive Fault-tolerant Control for a Class of Nonlinear Multiagent Systems with Sensor and Actuator Faults." IEEE Transactions on Circuits and Systems I: Regular Papers 69, no. 10 (2022): 4203-4214.

[25]. Kittur, Jeevan, Bhavya Desai, Rakesh Chaudhari, and Praveen Kumar Loharkar. "A comparative study of EMI shielding effectiveness of metals, metal coatings and carbon-based materials." In IOP Conference Series: Materials Science and Engineering, vol. 810, no. 1, p. 012019. IOP Publishing, 2020.

[26]. Cariboni, J., D. Gatelli, R. Liska, and A. Saltelli. "The role of sensitivity analysis in ecological modelling." Ecological modelling 203, no. 1-2 (2007): 167-182.

[27]. Gourieroux, Christian, Jean-Paul Laurent, and Olivier Scaillet. "Sensitivity analysis of values at risk." Journal of empirical finance 7, no. 3-4 (2000): 225-245.

[28]. Kumar, Ashish, Ketan Rathor, Snehit Vaddi, Devanshi Patel, Preethi Vanjarapu, and Manichandra Maddi. "ECG Based Early Heart Attack Prediction Using Neural Networks." In 2022 3rd International Conference on Electronics and Sustainable Communication Systems (ICESC), pp. 1080-1083. IEEE, 2022.

[29]. Saltelli, Andrea, Stefano Tarantola, and Francesca Campolongo. "Sensitivity analysis as an ingredient of modeling." Statistical Science (2000): 377-395.

[30]. Tibadia, Rajkumar, Koustubh Patwardhan, Dhrumil Shah, Dinesh Shinde, Rakesh Chaudhari, and Kanak Kalita. "Experimental investigation on hole quality in drilling of composite pipes." Transactions of the Canadian Society for Mechanical Engineering 42, no. 2 (2018): 147-155.

[31]. Soni, Rajkumar, Prasun Chakrabarti, Zbigniew Leonowicz, Michał Jasiński, Krzysztof Wieczorek, and Vadim Bolshev. "Estimation of life cycle of distribution transformer in context to furan content formation, pollution index, and dielectric strength." IEEE Access 9 (2021): 37456-37465.

[32]. Bhalla, Kanika, Deepika Koundal, Bhisham Sharma, Yu-Chen Hu, and Atef Zaguia. "A fuzzy convolutional neural network for enhancing multi-focus image fusion." Journal of Visual Communication and Image Representation 84 (2022): 103485.

[33]. Campbell, Katherine, Michael D. McKay, and Brian J. Williams. "Sensitivity analysis when model outputs are functions." Reliability Engineering & System Safety 91, no. 10-11 (2006): 1468-1472.

[34]. VanderWeele, Tyler J., and Peng Ding. "Sensitivity analysis in observational research: introducing the E-value." Annals of internal medicine 167, no. 4 (2017): 268-274.

[35]. D. Ravindran; M. Ramachandran; Vimala Saravanan, "Evaluating of E- Learning Programs using Gray-Related Analysis (GRA) Method", REST Journal on Banking, Accounting and Business, 1(1), (2022):26-33.

[36]. Manjunath, C. R., Ketan Rathor, Nandini Kulkarni, Prashant Pandurang Patil, Manoj S. Patil, and Jasdeep Singh. "Cloud Based DDOS Attack Detection Using Machine Learning Architectures: Understanding the Potential for Scientific Applications." International Journal of Intelligent Systems and Applications in Engineering 10, no. 2s (2022): 268-271.

[37]. Greenland, Sander. "Basic methods for sensitivity analysis of biases." International journal of epidemiology 25, no. 6 (1996): 1107-1116.

[38]. Chaudhari, Rakesh, Riddhish Parekh, and Asha Ingle. "Reliability of dissimilar metal joints using fusion welding: A Review." In International Conference on Machine Learning, Electrical and Mechanical Engineering (ICMLEME: 2014).–2014. 2014.

[39]. Trucano, Timothy G., Laura Painton Swiler, Takera Igusa, William L. Oberkampf, and Martin Pilch. "Calibration, validation, and sensitivity analysis: What's what." Reliability Engineering & System Safety 91, no. 10-11 (2006): 1331-1357.

[40]. Senkevich, Sergey, Vadim Bolshev, Ekaterina Ilchenko, Prasun Chakrabarti, Michał Jasiński, Zbigniew Leonowicz, and Mikhail Chaplygin. "Elastic Damping Mechanism Optimization by Indefinite Lagrange Multipliers." IEEE Access 9 (2021): 71784-71804.

[41]. Lilburne, Linda, and Stefano Tarantola. "Sensitivity analysis of spatial models." International Journal of Geographical Information Science 23, no. 2 (2009): 151-168.

[42]. Koundal, D., B. Sharma, and E. Gandotra. "Spatial intuitionistic fuzzy set based image segmentation." Imaging Med 9, no. 4 (2017): 95-101.

[43]. C. Venkateswaran; M. Ramachandran; Kurinjimalar Ramu; Chandrasekar Raja, "Analysis of Market Segment Evaluation Using Gray Relational Analysis Method", REST Journal on Banking, Accounting and Business, 1(1), (2022):52-60

[44]. Tian, Wei. "A review of sensitivity analysis methods in building energy analysis." Renewable and sustainable energy reviews 20 (2013): 411-419.

[45]. Rathor, Ketan, Keyur Patil, Mandiga Sahasra Sai Tarun, Shashwat Nikam, Devanshi Patel, and Sasanapuri Ranjit. "A Novel and Efficient Method to Detect the Face Coverings to Ensurethe Safety using Comparison Analysis." In 2022 International Conference on Edge Computing and Applications (ICECAA), pp. 1664-1667. IEEE, 2022.

[46]. Sukumaran, C., and P. J. Sebastian. "Effect of Inclusive Games and Physical Exercises on Selected Physical Variables among the Intellectually Challenged Children." Annals of the Romanian Society for Cell Biology 26, no. 01 (2022): 1442-1450.

[47]. Arora, Jasbir S., and Edward J. Haug. "Methods of design sensitivity analysis in structural optimization." AIAA journal 17, no. 9 (1979): 970-974.

[48]. Khan, Zuhaib Ashfaq, Hafiz Husnain Raza Sherazi, Mubashir Ali, Muhammad Ali Imran, Ikram Ur Rehman, and Prasun Chakrabarti. "Designing a wind energy harvester for connected vehicles in green cities." Energies 14, no. 17 (2021): 5408.

[49]. Rathor, Ketan, Sushant Lenka, Kartik A. Pandya, B. S. Gokulakrishna, Susheel Sriram Ananthan, and Zoheib Tufail Khan. "A Detailed View on industrial Safety and Health Analytics using Machine Learning Hybrid Ensemble Techniques." In 2022 International Conference on Edge Computing and Applications (ICECAA), pp. 1166-1169. IEEE, 2022.

[50]. Campolongo, Francesca, and Andrea Saltelli. "Sensitivity analysis of an environmental model: an application of different analysis methods." Reliability Engineering & System Safety 57, no. 1 (1997): 49-69.

[51]. Campolongo, Francesca, Andrea Saltelli, and Jessica Cariboni. "From screening to quantitative sensitivity analysis. A unified approach." Computer Physics Communications 182, no. 4 (2011): 978-988.

[52]. Zi, Zhike. "Sensitivity analysis approaches applied to systems biology models." IET systems biology 5, no. 6 (2011): 336-346.

[53]. K. Janaki Priya; M. Ramachandran; Manjula Selvam, “A Comprehensive Emergency Management using VIKOR MCDM Method”, REST Journal on Banking, Accounting and Business, 1(1), (2022):34-41.

[54]. Koundal, Deepika, and Bhisham Sharma. "Challenges and future directions in neutrosophic set-based medical image analysis." In Neutrosophic Set in Medical Image Analysis, pp. 313-343. Academic Press, 2019.

[55]. Saltelli, Andrea, Marco Ratto, Stefano Tarantola, and Francesca Campolongo. "Sensitivity analysis practices: Strategies for model-based inference." Reliability Engineering & System Safety 91, no. 10-11 (2006): 1109-1125.

[56]. Lomas, Kevin J., and Herbert Eppel. "Sensitivity analysis techniques for building thermal simulation programs." Energy and buildings 19, no. 1 (1992): 21-44.

[57]. Rathor, Ketan, Anshul Mandawat, Kartik A. Pandya, Bhanu Teja, Falak Khan, and Zoheib Tufail Khan. "Management of Shipment Content using Novel Practices of Supply Chain Management and Big Data Analytics." In 2022 International Conference on Augmented Intelligence and Sustainable Systems (ICAISS), pp. 884-887. IEEE, 2022.

[58]. Singh, Anuja, Tapan Behl, Aayush Sehgal, Sukhbir Singh, Neelam Sharma, Tanveer Naved, Saurabh Bhatia et al. "Mechanistic insights into the role of b cells in rheumatoid arthritis." International Immunopharmacology 99 (2021): 108078.

[59]. Nautiyal, Aditi, and Amit Kumar Mishra. "Machine learning approach for intelligent prediction of petroleum upstream stuck pipe challenge in oil and gas industry." Environment, Development and Sustainability (2022): 1-27.

[60]. Sukumaran, C., and P. J. Sebastian. "Effect of Inclusive Games and Physical Exercises on Selected Physical Variables among the Intellectually Challenged Children." Annals of the Romanian Society for Cell Biology 26, no. 01 (2022): 1442-1450.

[61]. C. Sukumaran; M. Ramachandran; Chinnasami Sivaji; Manjula Selvam, “Ranking of Product in E-store using WASPAS method”, REST Journal on Banking, Accounting and Business, 1(1), (2022): 1-9.

[62]. Chaudhari, Rakesh, and Asha Ingle. "Experimental investigation of dissimilar metal weld of SA335 P11 and SA312 TP304 formed by gas tungsten arc welding (GTAW)." Transactions of the Indian Institute of Metals 72 (2019): 1145-1152.

[63]. Castillo, Enrique, Roberto Mínguez, and Carmen Castillo. "Sensitivity analysis in optimization and reliability problems." Reliability Engineering & System Safety 93, no. 12 (2008): 1788-1800.

[64]. McCuen, Richard H. "The role of sensitivity analysis in hydrologic modeling." Journal of Hydrology 18, no. 1 (1973): 37-53.

