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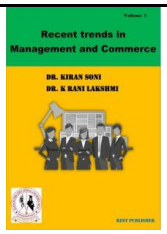


# A GRA Analysis of Supply Risk Assessment Techniques

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## Abstract

In bridge risk assessment, it is necessary to assess the probability and severity of the hazard, and the risk quality can be considered as a combination of the probability and severity of the hazard. Objective of this thesis finding the best location Bridge Risk Assessment USING Grey Relational Analysis (GRA). GRA method, incompletely known weight Many are intuitively confused with information For Solving attribute decision-making problems Calculation steps are given. Solution and negative-optimal solution between each alternate and positive-best the size of the gray relation is calculated. then, Positive-best solution (BIS) and negative-best The solution (NIS) is the same for calculating both amount of gray relation in time Rank A relative correlation The order of all alternatives to be decided is defined by degree. Finally, grown up Check the approach it's practical and Assessment Medium high (MH) is got the first rank whereas is the Low is having the lowest rank.
**Keywords:** Bridge Risk, MCDM method, Bridge Risk Assessment.

## Introduction

Modelling bridge hazards faced by highway agencies is a challenging task, as Good mathematical models cost a considerable amount and Saves time. In this paper, bridge risk Adaptive Neuroscience Ambiguity for Evaluation We developed a hypothetical system. grown up ANFIS has been used in past bridge maintenance projects Bridge risk scores and risk from Rules between ratings Learns and generalizes and Memorizes them for prediction. All the As mentioned above for risk assessment The approaches are conventional statistics and computing are based on techniques. This Techniques measure quantifiable risk parameters Although having merit in modelling, most inefficient in dealing with Quality factors that cause This study Explores surmountable alternative modelling techniques the typical shortcomings of modelling methods for, namely, Bridge risk in An artificial neural ANN network is suitable for estimation, it is qualitative and quantitative expert Includes judgments. ANN is bridge risk is a useful tool for assessment because It is from past experiences or examples ability to learn, the future contained. –update Despite its widespread use, this Despite its widespread use, this None of the applications are of a network of bridges Risk scores and risk categories Modelling is not considered. Hence, the primary objective of this study is neuroscience Bridge risk using networks Creating a framework for evaluation. Developed models has significant meaning and For bridge management and maintenance decision making Can provide valuable decision support. This By models, Highways Agency HA Bridge Manage risks more easily Can be controlled. What are the benefits and time to evaluate what Spend money too disadvantages each bridge maintenance program can provide is expensive and For bridge hazards and risk factors Like the complex relationships between, it takes time proven in the past. By models from experiences I learned and memorized. Examples. It is obvious a huge advantage for HA. Risk assessment was used to help address There are many different types of hazardous exposures and they are tools used by the institutions, industry, academic community and other To assess its reliability is mostly Challenges risk assessment on How to visualize access and risk to manage. These principles and methods Today it is still largely the foundation of this field represent, however, theoretical In both structural and practical models Many improvements have been made practices.

## Bridge Risk Assessment

Systematic Assessments of risks date back to the 1930s Human health in industrial setting Conducted and environmentally sound And above all size Approach US National Research Council Seen in 1983. Its initial contribution is risk influenced the assessment behaviour worldwide. Risk as applied to criminal justice systems Assessment tools are, in principle, taken should provide significant benefit to classification results. Generally, enterprise Risk assessments identify establishing potential losses, Amount of losses, potential losses Understanding potential, possible Emphasis on losses and includes overall risk assessment. In context of supply management, such evaluations are considered an important purchasing activity for purchasing personnel and organizations. The second level is scientific, viz Use of intuition, risk assessment and Some of the knowledge for the overall process of assessment Adds increment. These are the final three arguments Belonging to the latter category, and feelings And more about 'ideal' conditions Can be used to get lessons. judgments are expressed. This article deals with landslide risk assessment and Review recent developments in management Does and different for assessment Regarding the applicability of approaches discusses. Risk of landslides In the IUGS Working Group on Assessment

Committee Accepted by the authors used A variety of risk terms from definitions are available. A complete book or class lesson. This chapter does not go into depth on risk assessment and risk management. Those who want to know more are recommended to read the following Public concern has led to the adoption of risk assessment as a policy tool for identifying and quantifying the risks of cancer associated with chemical exposure. What about the possible contribution of chemistry delayed action because of cancer exposures and political frustration because microcystins are primarily intracellular, microcrystal concentrations increase manifold as biomass accumulates and risk assessment must take this into account. Swells often move toward shore, where high concentrations of cyan bacteria and their toxins or cells are released, posing a risk for human or animal contact. Lys is significantly higher. The ultimate goal to protect Historically, risk assessment was for adults Focus on exposures and toxicity Pays and vulnerable lives Paying little attention. Embryonic development and infancy. However Dynamics of adverse effects at the PN level To increase, different stages of the biological system can be crossed. Based on the rules AOPs are characterized by a highly direct causal pathway, transduction of multiple systems, combination of exposures, binding of toxic substances to bio molecules, intermediate key events, and severe adverse effect. In psychiatry, patients are voluntary in risk assessment and risk sharing schemes Does not penetrate, and reduces impact Risk assessments are conducted in the effort. Possible losses include suffering, injury and serious lawsuits, Death. In psychiatry, equivalent to premium the amount is not a simple fee, but The individuality of the additional treatment that the patient experiences Financial cost, including compulsory treatment, is high-risk For patients, whether they actually do or cause harm. Risk assessment is not a monolithic construct. Hanson presented three plausible approaches to risk assessment. According to Broom, Risk assessment is person-based and Risk assessment is person-based and Represents probability estimates of a continuous variable. This is model is the closest approximation in the literature to explanation problems; Although this describes legal skills rather than an "added" construct Risk assessment etc., current reasonably fit for purposes. This model is particularly important in this discussion there are two specific characteristics. In context, we can ask about "external circumstances". The person subject to the forensic evaluation must respond. This between two uncertain classes The distinction is important for risk assessment results has implications. By this method Steady-state the derived uncertainty limits That cannot be explained and under the model More knowledge about processes and parameters Can narrow as received. Because knowledge By increasing cognitive uncertainty Of course can be reduced, while alien Uncertainty is inherent to the system And cannot be reduced by detailed information.

## GRA

GRA methods fail to deal above with incomplete weight information With intuitive fuzzy MADM problems. An Interesting known attribute weight information. So of solving with intuitive fuzzy information expanding the concept of GRA to create, There is intuitively ambiguous takes the form of numbers. In this paper, the fuzzy GRA method we extend the scale we propose to solve the MCDM problem with values Expressed in scale weights Interval-valued triangular fuzzy numbers I do not know are installed. Then, extended to MCDM For the computational steps of the GRA method, alternatives Sort by a favourite Select interval-valued triangle Ambiguous estimates are given. That To do, the remainder of this paper follows are organized. In Section 2, the GRA method Brief introduction. In this paper, the unknown MCDM We considers the problem scale weights, where basis of traditional GRA Multi- Objective optimization based on idea We establish the model. Then, the linear Eq Multi-objective optimization, by weighting method The model to an objective programming model can MADM's with intuitive fuzzy information In function, sometimes, attribute values Intuition is a form of implicit information More information about takes and attribute weights Available pressure, knowledge or data and Limited expertise are incompletely known due to Above with incomplete weight information To deal with intuitive fuzzy MADM problems are missing. Given intuition Vague information and incompleteness and are the known attribute weight information How attribute weights from both To get is to focus on it Necessity is an interesting and Important research topic. Basic decision making theory Decision making based on theory technique. In gray, in theory, black is one with incomplete information Represents texture gray relationships with incomplete information For the corresponding and two rows To characterize the degree of interrelationship is used, thus tests precisely. GRA is the gray framework developed by Deng Decision making based on theory technique. In gray scale theory, black is A system with incomplete information indicates, at the same time a white structure Indicates complete information. However, grey The relationship is associated with incomplete information and of the connection between two arrays Used to classify size, thus two The distance of the factors can be measured separately. when the tests precisely. For service quality improvement in an academic library This research uses GRA to develop a QFD model uses. A formal GRA QFD model was developed to improve Relationship quality in ambiguous contexts. steps It can be summarized as follows.

## Analysis and Discussion

**TABLE 1**. Bridge Risk Assessment

| | **DM1** | **DM2** | **DM3** | **DM4** |
|---|---|---|---|---|
| Very low (VL) | 32.08 | 140.53 | 30.15 | 23.05 |
| Low (L) | 28.12 | 143.97 | 34.69 | 28.30 |
| Medium low (ML) | 25.08 | 123.58 | 30.18 | 24.10 |
| Medium (M) | 24.17 | 129.28 | 25.60 | 29.59 |
| Medium high (MH) | 34.33 | 187.41 | 28.96 | 21.89 |
| High (H) | 27.09 | 130.39 | 33.17 | 25.29 |
| Very high (VH) | 23.12 | 150.32 | 30.19 | 26.23 |

Table 1 shows the Bridge Risk Assessment for Grey relational analysis. DM1, DM2, DM3, DM4 Very low (VL)Low (L),Medium low (ML),Medium (M),Medium high (MH),High (H)Very high (VH) in this Alternatives or Evaluation value.

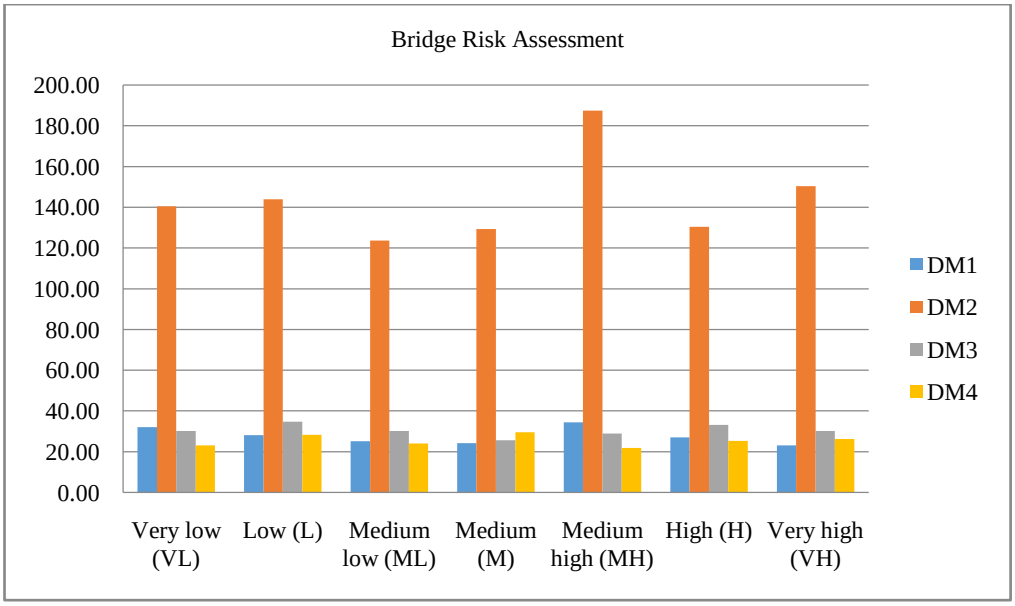


**FIGURE 1**. Bridge Risk Assessment

Figure 1 Shows the Manufacturing Environment for Grey relational analysis DM1,DM2, DM3,DM4 Very low (VL)Low (L),Medium low (ML),Medium (M),Medium high (MH),High (H)Very high (VH) in this Alternatives or Evaluation value. Medium high (MH), is showing the Highest Value) Medium low (ML) is showing the Highest Value

**TABLE 2.** Normalized Data

| | **DM1** | **DM2** | **DM3** | **DM4** |
|---|---|---|---|---|
| Very low (VL) | 0.7993 | 0.2655 | 0.4994 | 0.8494 |
| Low (L) | 0.4460 | 0.3194 | 0.0000 | 0.1675 |
| Medium low (ML) | 0.1748 | 0.0000 | 0.4961 | 0.7130 |
| Medium (M) | 0.0937 | 0.0893 | 1.0000 | 0.0000 |
| Medium high (MH) | 1.0000 | 1.0000 | 0.6304 | 1.0000 |
| High (H) | 0.3541 | 0.1067 | 0.1672 | 0.5584 |
| Very high (VH) | 0.0000 | 0.4189 | 0.4950 | 0.4364 |

Table 2 shows that the Normalized Data and seeing in figure 2.

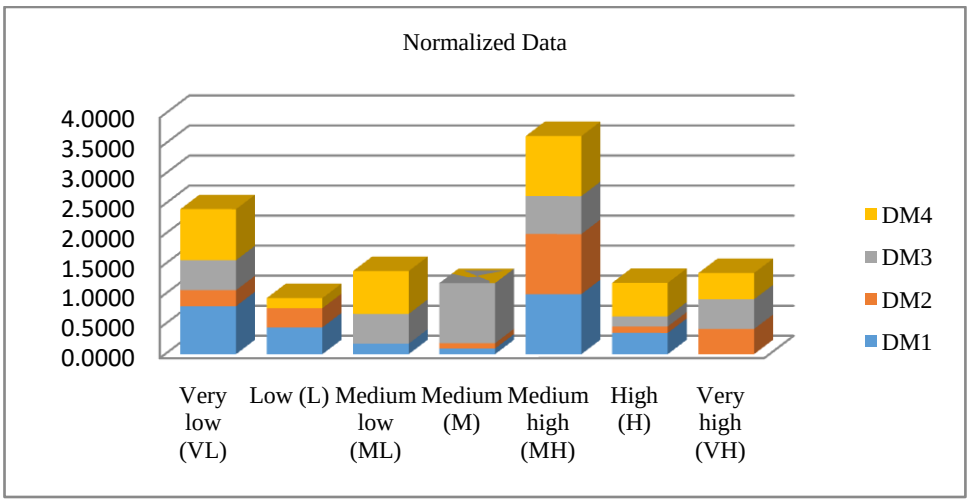


**FIGURE 2** Normalized Data

**TABLE** 3.Deviation sequence

| | **DM1** | **DM2** | **DM3** | **DM4** |
|---|---|---|---|---|
| Very low (VL) | 0.7136 | 0.4050 | 0.4997 | 0.7685 |
| Low (L) | 0.4744 | 0.4235 | 0.3333 | 0.3752 |
| Medium low (ML) | 0.3773 | 0.3333 | 0.4981 | 0.6353 |
| Medium (M) | 0.3555 | 0.3544 | 1.0000 | 0.3333 |
| Medium high (MH) | 1.0000 | 1.0000 | 0.5750 | 1.0000 |
| High (H) | 0.4364 | 0.3589 | 0.3752 | 0.5310 |
| Very high (VH) | 0.3333 | 0.4625 | 0.4975 | 0.4701 |

Table 3 shows that the Deviation sequence and seeing in figure 3.

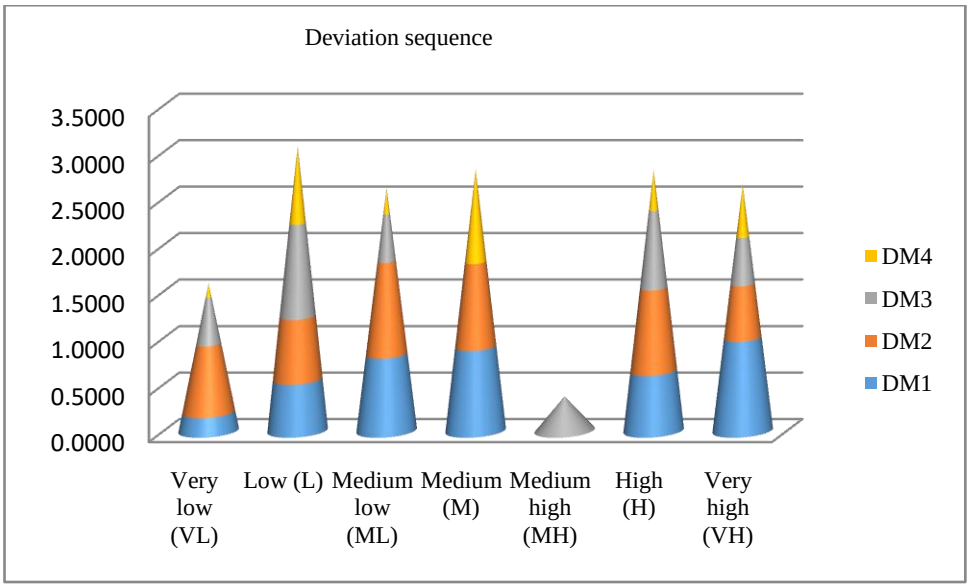


**FIGURE 3** Deviation sequence

**TABLE 4.** Grey Relation Coefficient

| | **DM1** | **DM2** | **DM3** | **DM4** |
|---|---|---|---|---|
| Very low (VL) | 0.7136 | 0.4050 | 0.4997 | 0.7685 |
| Low (L) | 0.4744 | 0.4235 | 0.3333 | 0.3752 |
| Medium low (ML) | 0.3773 | 0.3333 | 0.4981 | 0.6353 |
| Medium (M) | 0.3555 | 0.3544 | 1.0000 | 0.3333 |
| Medium high (MH) | 1.0000 | 1.0000 | 0.5750 | 1.0000 |
| High (H) | 0.4364 | 0.3589 | 0.3752 | 0.5310 |
| Very high (VH) | 0.3333 | 0.4625 | 0.4975 | 0.4701 |

Table 4 shows that the Grey Relation Coefficient.

**TABLE 5.** Result of final GRG Rank

| | **GRG** | **RANK** |
|---|---|---|
| Very low (VL) | 0.5967 | 2 |
| Low (L) | 0.4016 | 7 |
| Medium low (ML) | 0.4610 | 4 |
| Medium (M) | 0.5108 | 3 |
| Medium high (MH) | 0.8937 | 1 |
| High (H) | 0.4254 | 6 |
| Very high (VH) | 0.4409 | 5 |

Table 5 shows that the Result of final GRG Rank and seeing figure 4.

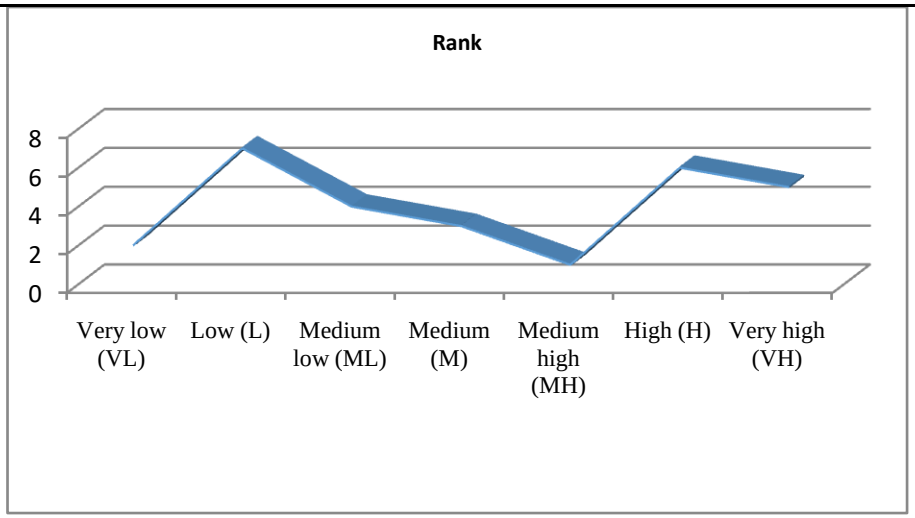


**FIGURE 4** Rank

## Conclusions

In this study, classify bearing faults A useful approach is to monitor proposed. of bearing signals The proposed model for classification is two Contains important positions. First At the (Gray correlation analysis) using the model are categorized. In the first stage, Statistical features are calculated. 1D-LBP After receiving the signals, from these signals Statistical properties are calculated. This are classified using features GRA. Because CRT panel glass has high silica content As is, it creates metal matrix composites As reinforcement such as fly ash can be used. Hence the present study Mg MMC, CRT panel glass different particle size and different weight % reinforcement wants to create Nowadays Graphite, PN and molybdenum disulfide Solid lubricants such as MMCs wear and tear and mechanical performance Added for improvement. But this Add more lubricants reduces the properties of the material to some extent due to their softening properties, so it is better to add less amount of solid lubricant The first step in the GRA process is of all alternatives is to normalize performance. This step is Converts the original array to a comparable array. Then, a reference sequence (ideal target sequence) Defined and best and Actual normalization is between rows Gray correlation coefficients to indicate correlation are calculated. Finally, this gray communication Based on the coefficients, also for reference series The gray between each comparison row Communication quality is calculated. Downloaded by ONDOKUZ MAYIS UNIVERSITY Gray relative quality is the reference and comparative sequences. A larger gray relative rank indicates A strong correlation with the corresponding sequence reference sequence. If two rows are identical, the gray relative rank value is equal to one. Otherwise, an alternative with higher gray relative quality is the best choice.

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