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Topic: The use of artificial intelligence in predicting and mitigating natural disasters.

1.0 Search and Selection

The search and selection process started by extracting the keywords from the chosen topic. These were then searched through Google Scholar without any filters to find relevant synonyms reflecting the topic. Quotation marks were added in order to obtain exact matches. Table 1 presents a summarized structure of different synonyms found along the keywords to acquire various relevant works of literature.

Table 1. Summarized Structure of keyword synonyms

KEYWORDS-	“Artificial intelligence”	Predicting	Mitigating	Natural disasters
SYNONYMS	“Machine learning”	Forecasting	Managing	“Environmental hazards”
	“Predictive analytics”	Estimating	Avoiding	“Catastrophic events”

After collection, they were put into the advanced search engines of numerous databases, including ProQuest, Scopus SpringerLink, and web of science. Furthermore, filters were set to show only the peer-reviewed articles with any of the keywords existing in their title, abstract, summary, or conclusion. The results showed an extensive range of articles narrowed down using document type and language filters. ProQuest and Scopus were not effective in terms of the relevance to the topic; however, through SpringerLink, the article that came at the top of the results, “Applications of artificial intelligence for disaster management” (Sun et al., 2020), was directly related to the chosen topic. This particular article had 106 citations which fulfilled the assessment’s criteria, allowing it to be chosen as the first article. Exploring further within the “cited by” articles “Machine learning in disaster management: Recent developments in methods and applications.” (Linardos et al., 2022) was also found to be highly pertinent and hence picked as the second choice. This article is not highly cited but fulfills the criteria of citing the first article and being peer-reviewed.

1.1 CRAAP test first article

Currency: The article was published on 3rd July 2020 in the journal “Natural Hazards” and was last updated in September 2020. As artificial intelligence is a relatively new topic, this article can be categorized as current with valuable information for the project.

Relevance: The article can be considered highly relevant as it provides a comprehensive review of available research and highlights the potential applications of AI to predict and mitigate natural disasters. The information assumes a thorough understanding of AI concepts and builds on it with technical applications to manage catastrophic events.

Authority: The authors' credentials support the statement of them being experts in their field. W. Sun, a professor of Environmental Engineering at Georgia Institute of Technology, has conducted multiple pieces of research in AI and disaster response. P. Bocchini, a researcher at the Department of Structural Engineering, Norwegian University of Science and Technology, assist him along with B.D. Davison, a professor at the Department of Civil and Environmental Engineering with an h-index of 45.

Accuracy: The article has presented information from highly cited articles, adding credibility and reliability. It has used a systematic review approach to identify and analyze the existing literature and has cited a total of 250 articles as per the reference list provided.

Purpose: The study aims to analyze and educate the potential benefits and challenges associated with using AI in mitigating environmental hazards. It has presented a balanced view of the topic with no biases found.

1.2 CRAAP test second article

Currency: The article was published on May 7, 2022, revised on April 28, 2022, and accepted on May 4, 2022. The article builds on the AI Applications previously used and suggests new ways to improve them. It is one of the latest articles in the field, adding that its information is up to date.

Relevance: The intended audience for this article is likely researchers and industry professionals, as it gives an in-depth overview of the latest methods used through AI to avoid natural disasters. It contains information about data acquisition and processing, feature selection, and multiple machine-learning models that have evolved to improve planning and management.

Authority: The article itself does not reflect any information about the credibility of the authors; however, through internet research further data is gathered. Vasilios Linardos is a researcher at International Hellenic University · Science and Technology. At the same time, Yannis Karnavas is a professor in the Department of Electrical and Computer Engineering at the University of Thessaly. MDPI is a reputable publisher; however, no evidence was found of them being affiliated with the organization.

Accuracy: The study's accuracy can be mediated by the fact that it has undergone a rigorous review process as being a peer-reviewed article. The article also includes a reference list of 68 cited articles adding to its reliability of the information. It further presents a comprehensive overview of the methods used, including an in-depth analysis of supervised and unsupervised learning, reinforcement learning, and deep learning models recently produced for disaster management.

Purpose: It does not seem prejudiced in favor of any specific viewpoint or item. The authors thoroughly summarize the state of the research and aim to educate the readers by outlining both the advantages and drawbacks of applying machine learning methods to disaster management.

References

- Linardos, V., Drakaki, M., Tzionas, P., & Karnavas, Y. (2022). Machine learning in disaster management: Recent developments in methods and applications. *Machine Learning and Knowledge Extraction*, 4(2), 446–473. <https://doi.org/10.3390/make4020020>
- Sun, W., Bocchini, P., & Davison, B. D. (2020). Applications of artificial intelligence for disaster management. *Natural Hazards*, 103(3), 2631–2689. <https://doi.org/10.1007/s11069-020-04124-3>