

# AI-Powered Disaster Data Calculation & SMS Alerting: An Overview

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**Abstract**—Natural disasters pose major threats to human life and infrastructure, necessitating the speedy and precise calculation of catastrophic data as well as effective alerting mechanisms to mitigate potential losses. Artificial intelligence (AI) discoveries have played a major role in altering disaster management strategies in recent years. This research study gives an overview of existing survey studies that investigate the usage of artificial intelligence-powered algorithms for disaster data processing and SMS notifications. Various AI-based methodologies, such as machine learning algorithms, deep learning models, and data fusion techniques, have been used to manage a variety of data sources, including satellite photos, remote sensors, and social media feeds. These AI-powered systems have demonstrated remarkable abilities in assessing disaster severity, estimating affected population density, and detecting severe infrastructure damage.

**Keywords**—AI-Powered, Disaster Data Calculation, SMS Alerting, Disaster Management, Machine Learning Algorithms, Deep Learning Models, Satellite Imagery, Early Warning Mechanisms, Intelligent Alerting Systems.

## I. INTRODUCTION

A research study that investigates the combination of Artificial Intelligence (AI) and image processing for disaster event data computation, and SMS warning systems in disaster management. This study uses previous studies and data to give light on the present state of these groundbreaking innovations and their consequences for improving catastrophe planning and response. Natural catastrophes, such as earthquakes and hurricanes, as well as wildfires and floods, have long provided substantial problems to communities across the world. Technological improvements in recent years have opened up new opportunities for better tackling these difficulties. The confluence of AI and image processing, in particular, has transformed the way catastrophe data is acquired, processed, and interpreted.

An overview begins with an examination of the underlying concepts of artificial intelligence and its diverse applications in disaster management. It looks at how artificial intelligence systems can handle massive volumes of data from satellite pictures, aerial photography, and social media posts, allowing for speedy and precise damage assessment. These insights enable disaster response teams to make data-driven choices and distribute resources more effectively, eventually enhancing relief efforts' efficacy. The evaluation of image processing

techniques such as object detection, picture segmentation, and pattern recognition, which play a crucial role in extracting important information from disaster-related photos, is a critical component of this review. It examines the approaches' strengths and restrictions, as well as recent modifications that have expanded their potential.

Furthermore, the article explores SMS warning systems' essential function in crisis communication and public safety. SMS alerts have become an important technique for warning persons about possible threats, evacuation orders, and critical precautions by leveraging the widespread usage of mobile phones. It evaluates the efficacy of SMS alerting in several crisis scenarios and investigates how the incorporation of AI might improve the timing and relevance of messages provided to impacted people. The study includes data from current research articles, case studies, and publications to provide a thorough assessment of AI-driven disaster management technology innovations. Furthermore, we examine how the public perceives these recent changes, as well as possible difficulties related to data privacy, reliability of the system, and acceptance.

It provides useful insights into the future prospects of artificial intelligence, image processing, and SMS alerts in disaster management. We highlight areas for additional study and development, emphasizing the importance of working together among research institutions, businesses, and the government in order to guarantee the responsible and successful installation of new technologies. A survey study stimulates fascinating debates and supports new research pathways in the dynamic field of catastrophe management. Our ultimate goal is for this thorough study to help communities confront the ever-present danger of natural catastrophes to have a safer and more resilient future.

## II. METHODOLOGIES

### a. *Effective Image Processing:*

Image processing is a way of extracting information from or refining an image by carrying out actions on it. Digital image processing has many uses, including picture restoration, medical imaging, remote sensing, segmentation of images, and so on. Each procedure needs