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Global Disaster Tracker

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Abstract: *The Global Disaster Tracker will be an application which will be used to monitor the disasters happening around the world. The goal of our project is to create an application which can track disasters accurately and update new information in near real time. The dataset which will be used is using NASA's EONET which stands for Earth Observatory Natural Event Tracker. EONET is a repository of metadata about natural events. EONET is accessible via web services.*

Keywords: Natural Disaster, Natural Calamity Tracker, Earthquake Tracker, Disaster Database.

I. INTRODUCTION

Climate change has been on the front page of news for a while now with numerous reports of weather extremes bombarding our daily news feed. Aside from your local weather reports on extreme heat, torrential downpours, or the ever-more- frequent tornadoes, two major disasters that seem to capture the most attention are hurricanes and earthquakes. Due to the high destructive power and long duration of devastation, they deservedly require our highest attentive state when they occur. We created a webpage that has a complete list of these catastrophes, from there you can filter out events by the type of catastrophe, the coordinates, a radius around the coordinates as well as a time frame filter. All in all with this you can find a list of natural disasters that happened with a very specific criterion. We learnt how to use so many different aspects of technology in harmony with each other, we initially were puzzled with all these different aspects such as HTML for the front end, API getting results, Python formulating those results but all in all that learning curve was amazing. Another thing was getting unstuck, this was a lot easier said than done but learning how to get unstuck took a while. We want to build a graphical representation using a few more API's, therefore people can have a visual representation rather than a list, which would be a better representation

II. RELATED WORKS

Xue Feng LV proposes that [1] In order to more rapidly and effectively obtain the geospatial location and quantitative distribution of the trapped people who are under the ruins or besieged by special serious natural disasters, such as earthquake, flood and landslide, a kind of natural disaster emergency rescue system based on the mobile phone's high-precision positioning of the trapped people is put forward.[2] China is one of the country's most seriously affected by natural disasters in the world. What's more important is that China is suffering many kinds of disasters which have wide range distribution, high frequency, regional strong seasonality, cause serious loss and present more complicated disasters. Disaster event management includes the whole process of disaster response. Integrated Disaster Reduction and Quick Service Platform can realize the comprehensive disaster prevention and mitigation business oriented from satellite mission planning, data acquisition, data production, products pushing to the application of remote sensing and mitigation integrated rapid service.

[3] The geographical and meteorological conditions of Japan make the country prone to frequent natural disasters such as earthquakes, tsunamis, typhoons, and floods. In the event of a major natural disaster, rapid and accurate information provision and communication is crucial to minimize the damage caused. In this study, we propose a disaster situation monitoring system using LINE API and a visualization system in a virtual city space to support disaster situation monitoring.

[4] To better improve the emergency communication and location-based services of disaster information reporting networks for serious natural disaster emergency response and relief, the national natural disaster reduction application platform based on BeiDou navigation satellite system is constructed. The administrative distributed platform is integrated with BeiDou positioning and multiple communication ways so as to achieve main disaster reduction application services, including disaster information acquisition and monitoring, emergency relief for trapped people,

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on-site emergency relief command service, relief supplies' transportation monitoring, and disaster information publishing service.

[5] Population growth in urban areas drives people's vulnerability to natural disasters, especially in emergent economies like Brazil. The existing automatic pluviometry network is insufficient to provide enough information to monitor and prevent deaths due to landslides and floods in 821 municipalities defined as priority ones in the Brazilian National Plan of Risk Management and Response to Natural Disasters, implemented in 2012. Therefore, aiming to support early warning and monitoring systems and make available near-real time rain data, the National Early Warning and Monitoring Centre of Natural Disasters (Camden) has carried out an integrative institutional project to acquire and identify optimal places to install 1400 automatic pluviometers in risk areas of landslides and/or floods, already mapped in more than 350 Brazilian municipalities where existing network is scarce.

[6] The Chinese geohazards observations and natural disaster assessment system is establishedso as to make information related to environmental risk and vulnerability easily accessible to decision-makers through this centralized platform. In the case of the MS 7.1 Yushu earthquake disaster, for emergency response, we presented a method for generating seismic intensity maps based on seismological mechanism solutions. The disaster assessment system automatically drew the distribution map. Referring to usable data, the chains of rapid assessment on earthquake disaster are analyzed, and different models are established for assessing affected population, damaged houses and lifelines and comprehensive earthquake loss evaluation.

[7] Currently, spatial information technology and emergency management technology are widely used in the 10th Division of the Xinjiang Production and Construction Corps (XPCC), China. In this paper, emergency management system architecture based on Web services and service-oriented architecture (SOA), which is oriented to several kinds of natural disasters and emergent public security events are proposed. By analyzing data characteristics and functional requirements of several kinds of disaster monitoring and evaluation systems, we design the logical structure and architecture of emergency response platforms oriented to natural disasters and emergent public safety events, and present the system operating mode and emergency resources scheduling mechanism based on service-oriented architecture.

III. IMPLEMENTATION

We created a webpage that has a complete list of these catastrophes, from there you can filter out events by the type of catastrophe, the coordinates, a radius around the coordinates as well as a time frame filter. All in all with this you can find a list of natural disasters that happened with a very specific criterion. Our inspiration for this project was how so much happens in terms of these catastrophes happening in the world and we barely get to know about it, let alone help. Therefore we thought to create a complete list accessible to anyone, so not only would they be able to track these calamities but try to help which is our biggest inspiration. We built it using Python and Flask for the API interactions and fetching the data and then represented the data using our HTML & CSS files. The API we used was NASA's EONET which is the Earth Observatory Natural Event Tracker.

Python is a high-level, general-purpose programming language. Its design philosophy emphasizes code readability with the use of significant indentation. Python is dynamically-typed and garbage-collected. It supports multiple programming paradigms, including structured, object-oriented and functional programming. Python is a computer programming language often used to build websites and software, automate tasks, and conduct data analysis. Python is a general-purpose language, meaning it can be used to create a variety of different programs and isn't specialized for any specific problems.

Machine learning (ML) is a type of artificial intelligence (AI) That allows software applications to become more accurate at predicting outcomes without being explicitly programmed to do so. Machine learning algorithms use historical data as input to predict new output values. Recommendation engines are a common use case for machine learning. Other popular uses include fraud detection, spam filtering, malware threat detection, business process automation (BPA) and Predictive maintenance. Classical machine learning is often categorized by how an algorithm learns to become more accurate in its predictions. There are four basic approaches: supervised learning, unsupervised learning, semi-supervised learning and reinforcement learning. The type of algorithm data scientists choose to use depends on what type of data they want to predict.

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Html and CSS were extensively used to create the front end of our project. We built it using Python and Flask for the API interactions and fetching the data and then represented the data using our HTML & CSS files. The API we used was NASA's EONET which is the Earth Observatory Natural Event Tracker . We created a webpage that has a complete list of these catastrophes, from there you can filter out events by the type of catastrophe, the coordinates, a radius around the coordinates as well as a time frame filter. All in all with this you can find a list of natural disasters that happened with a very specific criterion.

IV. EXISTING SYSTEM

The National Oceanic and Atmospheric Administration's natural hazards viewer shows a variety of recent and historic natural hazards around the world. The interactive map provides data for a range of natural hazards, including tsunamis, volcanic eruptions, and earthquakes. Users can select individual hazards to learn more about the date of occurrence, location, severity, economic impact, and social impact. Experts have stated that emissions have fallen sharply worldwide. In China, carbon emissions dropped 18% while in the European Union, declining power demands and depressed manufacturing could cause emissions to fall by nearly 400 million metric tons this year. Climate activists have noted such reductions and called for continued reductions in the future.

Map of disaster alerts in the past 4 days. European Union, 2022. Map produced by EC-JRC.The designations employed and the presentation of material on the map do not imply the expression of any opinion whatsoever on the part of the European Union concerning the legal status of any country, territory or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The blurred events in the list below are the past events before the last 4 days. For drought alerts, all the events listed in the homepage are ongoing events. In bold: i) new events; ii) events where a significant worsening has been detected (+ 0.5 GDACS score or increase in the Alert Level); iii) events where new information products are available (Global Drought Observatory Report)

V. PROPOSED SYSTEM

We created a webpage that has a complete list of these catastrophes, from there you can filter out events by the type of catastrophe, the coordinates, a radius around the coordinates as well as a time frame filter. All in all with this you can find a list of natural disasters that happened with a very specific criterion. Using client applications, such as NASA EOSDIS' Worldview, users can browse the entire globe daily and look for natural events as they occur. Regularly spotted storms in the tropics, dust storms over deserts, forest fires in the summers. The curation of events is a significant component of the EONET system, and while the technical details are, to an extent, straight forward, the definition of what exactly constitutes an *event* is fluid and daring us to be constrained. What are the contextual parameters of an event? If one curator defines a specific wildfire in Idaho as a discrete event and another defines the summer wildfire season in the Pacific Northwest as a single event, what does that mean for the end user? If an end user can filter by source/curator, does that provide them with ample context for the development of their application.

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VI. CONCLUSION

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VII. FUTURE WORK

Python is and remains a stable programming language currently used not only by developers but it is considered great for deployment automation and web development. Non- developers when first introduced to the Python language and its ecosystem, also prefer it for doing data work.

Thus, our intention is to implement our program by integrating artificial intelligence and machine learning so as to not only be able to track natural disasters but also simultaneously predict future disasters which could be helpful to a lot of fields of study and science. AI enables an unprecedented ability to analyze enormous data sets and computationally discover complex relationships and patterns. AI, augmenting human intelligence, is primed to transform the scientific research process, unleashing a new golden age of scientific discovery in the coming years. The future of machine learning is exceptionally exciting. At present, almost every common domain is powered by machine learning applications. To name a few such industries – healthcare, search engine, digital marketing, and education are the major beneficiaries.

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