PARISUTHAM INSTITUTE OF TECHNOLOGY AND SCIENCE ,THANJAVUR

LITERATURE SURVEY

NATURAL DISASTER INTENSITY ANALYSIS AND CLASSIFICATION OF AI

Damage mapping using U-Net convolutional network.

Year:2018

Author name : Yanbing Bai, Eric Mas, Schunichi Koshimura

Natural disasters cannot be prevented- but they can be detected, giving people precious time to get to safety. In this, a deep learning algorithm for the semantic segmentation of high-resolution remote-sensing images using the U-net convolutional network was proposed to map the damage rapidly. The algorithm was implemented within a Microsoft Cognitive Toolkit framework in the GeoAI platform provided by Microsoft. The study takes the 2011 Tohoku Earthquake-Tsunami as a case study, for which the pre- and post-disaster high-resolution WorldView-2 image is used. The performance of the proposed U-net model is compared with that of deep residual U-net. The comparison highlights the superiority U-net for tsunami damage mapping in this work. The deep learning method, which is represented by automatic feature extraction and selection, has achieved state-of-the-art performance in various remote-sensing-based damage assessment applications Finally, we output the damage-mapping result in the Arc GIS platform.The design of the framework considers the availability of data sources, the feasibility of model implementation, time cost and accuracy of the method immediately after the disaster.

Merits: AI can use the seismic data to analyze the magnitude and pattern earthquake.

Demerits : In CNN Large training data needed, don’t encode the position and orientation of object.

Natural disaster intensity analysis and classification based on multispectral images.

Year:2021.

Author name:Muhammad Aamir, Tariq,Irfan, Ahmad,Azam, Adam, FrantiseBrumercik,,Witold.

Natural disasters not only disturb the human ecological system but also destroy the properties. A deep learning method for the reconstruction of two-dimensional cardiac magnetic resonance images. Convolutional Neural Networks (CNNs) are the direct input of multidimensional vector images, speech recognition, and image processing can be carried out with low complexity. CNNs efficiently perform feature extraction by denoising the images and removing interference and achieve highly accurate results. The proposed multi-layered deep convolutional neural network method works in two blocks of convolutional neural networks. Block-I Convolutional Neural Network (B-I CNN), detects the occurrence of a natural disaster and Block-II Convolutional Neural Network (B-II CNN), defines the intensity of the natural disaster. The first block consists of three mini convolutional blocks with four layers each and includes an image input and fully connected layers. The second block also consists of three mini convolutional blocks with two layers each, including an image input layer and fully connected layer.

Merits: Data acquired from UAVs helps to identify the facial expressions of victims, the intensity of their situation and their needs in a post disaster scenario.

Demerits: Unpredictable, Cant suitable for all type of disaster.

Natural Disaster Application on Big Data and Machine Learning

Year :2019

Author name **:** Rania rizki Arinta,Andi Wahju

Natural disasters are events that are difficult to avoid. There are several ways of reducing the risks of natural disasters. One of them is implementing disaster reduction programs. Big data, machine learning is mostly used. By utilizing this method , it facilitates tasks in visualizing, analyzing, and predicting natural disaster. Here is, the use of big data, machine learning, and deep learning in 6 disaster management area. This 6-disaster management area includes early warning damage, damage assessment, monitoring, detection, forecasting , predicting, and post-disaster coordination, response, long-term risk assessment and reduction. To find out whether the previous research solved the problem in the prediction area and early detection we must know the data source used already has 5'v characteristics, namely Velocity, Volume, Value, Variety, and Veracity. The performance level of the model made is good or not from the level of accuracy, precision, recall, and the execution time. The propose of this study to give an insight and the use of big data, machine learning, and deep learning from 6 disaster area which is early warning damage, damage assessment.

Merits: Big data in the evacuation process to plan accordingly during the time of disaster **.**

Demerits: Traditional storage can cost IoT money to store big data

Artificial Intelligence For Disaster Risk Reduction

Year: 2018

Author name: Monique Kuglitsch, ArifAlbayrak, Raúl Aquino, Allison Craddock.

Artificial intelligence, in particular machine learning (ML), is playing an increasingly important role in disaster risk reduction (DRR) – from the forecasting of extreme events and the development of hazard maps to the detection of events in real time, the provision of situational awareness and decision support, and beyond. AI refers to technologies that mimic or even outperform human intelligence when performing certain tasks. ML, which is a subset of AI that includes supervised,unsupervised or reinforcement learning, can be simplified as parsing data into algorithms that learn from data to make classifications or predictions. AI methods offer new opportunities related to applications in, for instance, observational data pre-processing as well as forecast model output post-processing. The methodological potential is strengthened by novel processor technologies that allow heavy-duty, parallel data processing.

MERITS

- It saves lives and money and future -proofs our development gains.
- It yields economic, social, environmental benefits that enhance the well-being and resilience of countries and communities.

DEMERITS

- In a disaster, you face the danger of death or physical injury. You may also lose your home, possessions, and community.

Natural disaster Monitoring with Wireless Sensor Networks

Year:2013

Author name: Dan Chen,Zhixin Liu,Lizhe Wang,Minggang Dou.

Abstract: The wireless sensor network (WSN) technology has applied in monitoring natural disasters for more than one decade. Disasters can be closely monitored by augmenting a variety of sensors Natural disaster monitoring with WSN is a well-known data intensive application for the high bandwidth requirements and stringent delay constraints. It manifests a typical paradigm of data-intensive application upon low-cost scalable system. By making representative works in this area by classifying those in the domains of application of WSNs for disasters and optimization technologies significantly. WSN technology inspired by the existing work with focuses on issues of supporting reliable data transmission, handling huge data of heterogeneous sources and types, andminimizing energy consumption. This study proposes a dynamic routing protocol, a method for net-work recovery, and a method for managing mobile nodes to enable real-time and reliable data transmission.. A distributed algorithm for joint optimal control of power and rate has been developed, which can improve utility of network more than 95% and to minimize the energy consumption. Experimental results indicate the potentials of the proposed approaches in terms of adapting to the needs of early warning on geo hazards.

Merits: Low cost, scalability, flexibility.

Demerits: As it is wireless in nature, it is prone to hacking by hackers.