

A survey on predicting oil spills by studying its causes using deep learning techniques

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ABSTRACT

It's so easy to know the accidents as it's already happened and solving these accidents is immediately handled, but searching for a solution for these accidents, don't deny the existence of reasons that made accidents happen. Knowing the source of accidents will help in avoiding them to occur in the future. It's an important field in searching as some human lives depend on the safety of such a field, so it's so important to use a powerful technique to define these reasons as the research point in spill accidents and predicting accidents and to predict the occurrence of the accident before its happening depending on its reasons that lead to that accident in past times so with similar conditions it might happen an accident but it needs a sufficient data and a powerful technique such as deep learning techniques that give very precise results and by using this tool an intelligent model will build to predict oil spilling. In this survey paper, related work will be discussed to enhance that work.

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1. INTRODUCTION

Petrol is so important in our life and an important issue to speak about. In most of the other researches a lot of monitoring pipelines and give warning or alarm as mentioned in [1] that there's a leakage in some pipelines that can give a huge spilling that lead to a lot of loss and wasting time or an exploration in the location that lead to a lot of losing in human life and money as explained in [2, 3]. Another researches that studying and focus on handling the accident after its occurrence. In our research will study all causes that caused that accident and prevent its occurrence.

Pipelines are an important issue in this field in its structure and transporting it with safety ways in [4-6] a lot of methods has discussed to structure the pipelines with perfect way and in limited sizes with efficiency work. Transforming is the last phase after extraction oil to make it ready for use and it depends on a lot of factors that affect on it such as high temperature that oil properties must be handled with that high temperature and a lot of challenges that will be faced, an insulating oil is used to make the transformer so cold to operate safely and using a specific materials with exact temperature for each material by secure transferring of these materials and energies [7, 8]. In [9, 10] transferring petrol process after extraction process is an important phase in this field as it depends on the container of the material, material itself, climate of the extraction location and received one, paint of the container, and the transportation vehicle that lead the road. Transporting process also affects on all creatures such as people, animals, and plant's life as discussed in [10] in Kabul city and the bad effect of that process on all these creatures.

This reviewing indicate to us how that field is so important and what are risks and benefits that occur when will you work in that field or similar fields such as coal, metal, and all mining materials that give us a wealth in industry and a main reason for nation progress. As a result of this research an intelligent model will be built to predict spill accident by studying its causes using deep learning techniques to make the entire world safe and clear and avoid all losses in money, time, and creature's life. The paper is structured as follows: Section two discusses incidents involving oil spills by partitioning them into two types onshore oil spills and offshore oil spills. Sections three and four introduce deep learning algorithms with Samples of combinations between oil spills that treated or discovered by deep learning algorithms five and finally section five presents conclusion of the survey.

2. OIL SPILL ACCIDENTS

From [11] Oil spill accidents is one o the most important problems we need to speak about and discuss it's details. First, we are going to know a lot of issues such as 1) what's the importance of oil usage in our life, 2) how the process of extraction and transportation happened, 3) how problems and accidents affect our life generally and economic specially, 4) how to fix and treat with these problems, and 5) knowing some of the accidents and countries that hsd affected and face a lot of loses because of these problems.

- a) What's the importance of oil usage in our life: we can't deny that oil, gas, natural gases, and all of such materials are so important in the life as all of the transportation processes can't happen without these materials. Material such as petrol control in the economy of the country as it can make the country that export oil is so rich and has a lot of weapons to make it strong. Few countries that have the advantage of having the oil in their lands as these few countries save their own usage of the oil and such materials, also will hire a lot of managers, engineers, workers, and drivers to employee in this field from digging the location of the petrol to delivering the usage materials to their users. Regardless many people and their benefit from working in such a field, the country will benefit first from the petrol that extracted from the land to their own transportations also don't forget all of the machines and factories that can't work without petrol or like materials, also the profit of the exported of this oil that can be a many profit and a friendship between countries that exchange the oil. Benefit not only for the country of having the oil also the countries that imported these oils can't work without this oil, so in that case cooperating of the countries is so important to high life continue [12, 13]. Mentioning that before the process of extraction oil the world was depending on the Pisces oil that extract from the whales that found in the sea that need a lot of workers, fishers, and strong workforce to getting that Pisces oil from dangerous whales. From knowing the past this process of extracting oil is so more save that whales and cover a lot of usage of countries, however there're a lot of problems and hazards that face this operation and need to a lot of workers, time, and budget to treat with any problem of oil problems [14].
- b) How the process of extraction and transportation happened:in [15-17] oil extraction is not an easy operation for all and not every people can do. It needs a lot of people to execute that operation and not only people are important in that operation, but also a lot and big of giant equipment's that only some companies can introduce it. This equipment sometimes it's not for selling, but other companies hire this equipment's for the digging and extraction companies. In such field specific equipment that used also a specific paints for these equipment's and transportation process need to execute these processes safely. First choosing the perfect point to dig in it that will be the source of extraction also they use a pacific explosion and hazard materials for the process of digging. It's so important to be careful in the location of the digging point also there're a lot of giant equipment's that need a huge space to put it in. Not only equipment that important but also a lot of workers from different degrees are needed to make work continue. Secondly the extraction after digging need a precise work is so important in that stage as explosion may happen during this process. A lot of Petroleum cylinders are needed to store the extraction oil safely these Petroleum cylinders are designed in a high precis way to be save for storing such as kind of materials that these Petroleum cylinders made with it also the type of painting materials that used in this Petroleum cylinders also they designed with specific sizes to be fit for storing, transporting and more safely for all sides. Thirdly the transportation processes need specific vehicles to carry all of these Petroleum cylinders or Oil drums safely to the participators of the petroleum materials. Transportation vehicles are different in onshore and offshore locations. During the process of transportation a lot of problems that can happen between the location of the extraction to the location of selling it for ordinary people. Finally, the transportation of all workers in locations with all degrees that return to the place they will transmit to if it at the water that sometimes need a plane or boats to transfer them to the location of digging, according to locations on lands it need a different type of cars.
- c) How problems and accidents affect our life generally and economic specially: As mentioned before oil has an important role The renaissance of the country or The fall of the country, then occurring any

problem in this field will cause a lot of losses or the country that face such a problem. Spilling accidents can happen during any face of the oil extraction and transportation and these problems will affect in country generally and in the company specifically. In [18-20] According to the effects on country, losing a massive amount of oil will lead or a deficit in the use and export, which leads to the deterioration of the economy, which in turn affects the state and welfare of the country. According to the effects on company a lot of many will lose because of the losing amount first that serve a lot of many also spilling in any location can't leave it and go there're difficult procedures to handle it, people of the crashed place will give them a lot of money to make up for them. Spilling also will need a lot of workers and engineers to handle this problem and it's a consumption of company resources and wasting a lot of time also other equipment will be used to treat that problem. After accident of spilling not only company will lose their resources and time but also another problem will display such as the problem of The bad smell of petroleum and hard breathing as air will pollute and affect in all lives around this area also all birds will be affected and a lot of them die from this accident and in offshore locations not only birds or human will affect, but also the Aquatic life will face a big problem as all fishes and other Sea creatures will be dead in the same moment of drink or smell it. In addition to all of these problems there's a problem of climate change.

- d) How to fix and treat with this problems: Fixing oil spill accidents as mentioned before will take a lot of time, working, employments in different degrees, and a lot of money so in that case fixing a good solution after spilling but there's a better solution for that such as preventing such a problem like that and that what the research about. For preventing that problem from happening a detailed study of reasons will happen and a lot of safety measures will take in all locations of the petrol whenever in the location of the digging or during the transportation process and a lot of instructions will be teaches to all workforce of the all location. A powerful tool is necessary for this study to prevent the problem of accident [21, 22].
- e) Knowing some of the accidents and the countries that affect and face a lot of losing because of these problems: there're a lot of countries that face a lot of problems because of spill accident. Table 1 and 2 display the top ten accidents in both United States and the world.

Table 1. Top ten oil spill accidents in the United States

Rank	Date	Cause	Source	Location	Spill Volume	
1)	20 April 2010	Outbreak	Deepwater Drilling	Horizon	Gulf of Mexico, 50 miles from the Louisiana coast	An additional 200,000 liters per day
2)	24 March 1989	Collision with coral	Exxon Valdez tanker	petrol	Sound from Prince William, Alaska	More than 10 million Gallons
3)	15 Dec 1976	ran aground	tanker Argo Merchant		Nantucket Island	7.7 Million Lbs.
4)	Aug – Sept. 2005-2005	Hurricane Katrina	various sources		New Orleans, La.	7 million Lbs
5)	8 June 1990	Outbreak	Mega-Borg tanker		Galveston, Texas 60 miles	5.1 million Lbs
6)	28 Nov 2000	ran aground	tanker Westchester		Port Sulphur, La.	567,000 Lbs
7)	23 Jan 2010	Collapse	Otome Eagle Tanker		Harbor Arthur, Texas	462,000 Lbs
8)	25 July 2008	Collapse	unnamed barge		New Orleans, La.	419,000 Lbs
9)	7 Dec 2004	Was running aground	M / V Ayu Selendang.		Iles Aleutians, Alaska	337,000 Lbs
10)	10 Aug 1993	collision	barge Bouchard B155		Tampa Bay, Fla.	336,000 Lbs

Table 2. Top ten oil spill accidents in the world [1]

No	Accident Year	Day and Month	Ship/Incident	Accident Country	Accident Location	Tons ($\times 10^3$)
1)	1991	26/1	The Conflict in the Gulf	Kuwait	The island of the sea	800
2)	2010	20/4	Deep Sea Horizon	United States	Mexico gulf	500
3)	1979	5/6	Blow Out IXTOC	Mexico	Mexico gulf	470
4)	1979	19/7	Atlantic Imperialist / Captain Aegean	Off Tobago	The Caribbean	287
5)	1992	2/3	Blowout Oil well	Uzbekistan	The Valley of Fergana	285
6)	1993	4/2	Blow-out on the oil platform	Iran	Nowruz sector	270
7)	1983	6/8	Bellver Castle	South Africa	Bay of Saldanha	260
8)	1991	28/5	ABT Summer	Off Angola	The Atlantic	260
9)	1978	16/3	Cdiz Amoco	France	Brittany	223
10)	1991	11/4	Avenue	ITALIA	Genoa-Geneva	144

Afetr discussing all benefits and importance of exisrace petrol in our life and knowig risks of losing that wealth, it's so important to plan for security of that field as many research focus in that point such as in [23] that the straight existing induction method was discovered to be safe for the impressed current cathodic protection (ICCP) device and outdoor area. In [24] the center of the pipe need can be evaluated at Al-Quds petrol location in Baghdad. Nonetheless, sustaining this is almost tough. Think of the Al-Quds petrol location analysis for example, the length of the pipe is 6000 meters so, if the outcomes of the ANSYS are accepted, the critical anodes are to be inhumed at 2000 meters from the pipe.

Drilling for extraction petrol is an imortant phase of that field and it's esesntial to make that operation safe and organized. As discussed in [25], in order to create safe and operational digging an additional starch from wheat flour has been removed and performed as a liquid insufficiency monitoring operator and showed that the effectiveness of starch from wheat flour is increasing in rheological characteristics as contrasted to starch mostly on flea market by using matching and different amounts from both.

In [26] keeping our household confirmed from any type of threat, a recommended effort is used to identify gas spill over a gas radar and to determine the weight of the cylinder over the capacity of the cells. The actual period information and data will be kept in the cloud for more use in the coming evidence. It is also necessary to acknowledge the quantity of gas obtainable by weight of the cylinder and due to time of alteration of different tube. In [27] an replacement methodology has existing to evolving a device that can automatically discover and tracking gas spills and also observe the heat and evidenced that this machine meaningfully rising of the possibilities and effectiveness of rejecting gas spilling.

In [28] another experiments to discover gas spilling using a device that can use Sensor Mq-2 to spill sound gas consternation by Modul ISD 1760, and by using a solenoid valve to prevent gas from moving from the pipe to the bonfire. There is also the hardware of a torch radar to discover a combustion if there is a new spark and dispersing water into the macula that is expected to spark fire. When using ATMega 328microcontroller. Observing can use android smartphone, all hardware will be in, with the application that can give the mobile phone a quick and direct caution.

2.1. Onshore oil spills (land spills)

Spills in land consider a big disasters as it harms the ground first as cities and towns also it harms the agriculture then it harms human that live into these places or near to them so it's so important to recover these spills in the same moment they happened Spill response approaches, for example in urban environments, put primary importance on protecting human health and restoring accessibility at the spill site as quickly as possible. Since the "industrial" flag may include everything from marked roads to jungles and parks, the exact response needs to be detailed to the affected environment. Since spilled oil on land prevents water from being completely filled with soil that would kill any life in the water and out of the water, spills on agricultural sites or grasslands have the effect of choking off plant life. If a spill occurs in these environments, the highest primacies of the reaction are to avoid leakage of oil into groundwater or to enter waterways as a run-off, and to return the soil as quickly as possible for production.

In [29] a blurred neural network model based on failure tree and blurred number computing has been developed to predict the possibility of failure of oil/gas pipelines and a prediction model based on the MATLAB neural network toolbox used to measure the possibility of failure of the filtered oil pipeline Lanzhou-Chengdu-Chongqing. It can be found that the consequences of the analysis are found to be mostly consistent with the consequences that were based on previous fault data; therefore the accuracy and accuracy of the FNN model can be confirmed. The accuracy of the FNN is related to a number of functions. There is still a lot of coming research work to do, including model stages, The number of neurons, the selection of transmission functions and the training of error value and price, or even the selection of preparation samples, will have a major impact on the accuracy of predicting results, but the selection of appropriate model parameters should be further studied.

In [30] in this research paper mining techniques were used to analysis the top reasons that responsible for underground and surface accidents in Spain using software weka. Data from the Spanish Ministry of Jobs and Social Security was used between 2005 and 2015. Results showed that the most significant immediate cause is physical exertion or overexertion of body movement. This paper used a poor program like weka with small data as weka is unable to process large data and produce memory messages in large databases.

An evolution of films by gas stage epitaxy has been investigated in [31]. Established by the study, they express circumstances for enhancing the similarity of the belongings of the films gained. For study procedures, a systematic methodology offered gas stage epitaxy structure with expected explanation of convection, and the likelihood of varying the biological communication ratio between reagents.

2.2. Offshore oil spills (water spills)

The spreading of water is usually fixed through underground tubes. It is important to observe the underground water tubes than to observe the open spot water tubes located on the ground. This condition can cause continued harm if a problem such as spilling happens in the tube. Tube spills can be produced for many reasons, such as the age of the tube, the incorrect structure and the natural catastrophe [32].

Spills that happened in the water whether oceans or on the sea or on the lakes are so important to discuss as here it effects on human life, air and weather in nearby places, water, and creatures in the sea also, it effects on the birds that try to drink or touch these spills. It damages the fishing wealth and it will affect in the public economy and public health. Once oil is leaked into the ocean, it spreads mostly over the surface in the water, depending on its relative density and volume. The formed oil slick can persist or interfere with the presence of rough seas. Waves, water currents and wind cause the oil spill to float over vast areas, affecting the open ocean, the coastal regions, and marine and terrestrial ecosystems along the drift course.

In [33] a pressure-balance-based approach was proposed to capture two forms of active circle pressure behaviors in a gas well with sustained case pressure (SCP) triggered by the pipes leakage at different perfect depths and the gas-lift faucet failure in operation This method includes models representing the effect of tubing and annulus fluid temperature and pressure spreading that are used to assess tubing spill points and to test the average annulus pressure at the rig under different circumstances. Diagnosis of offshore gas leak tested in this research. In [34] New methods for quantifying geometric uncertainty were developed using fine-and coarse-grid models in the lake's mouth along the north shore of the Gulf of Mexico. We proposed and tested a new data-driven ambiguity model alongside a multiple models integration approach to measure this ambiguity in a working sense by using geometric uncertainty procedures. The data-driven uncertainty model is developed by applying an algorithm for machine learning that provides a priori valuation of the assurance point of the forecast. The incorporation of multiple models generates joint forecasts by contrasting them with minimal fine grid forecasts. The two methodologies provide obvious information on the predictable scale of modeling errors made by geometric confusion in an acceptable modeling process method.

In [35] a multi-frequency radar system was used to photograph monitored releases of hazardous and noxious substance (HNS) above the Mediterranean Sea in May 2015. The main objective of this research was to establish a procedure for collecting evidence of illegal oceanic contamination by toxic liquid materials using airborne radar sensors or a flying radar sensor with another meaning. They validate radar imaging's ability to discover, describe, and distinguish chemicals that have been found at sea. They implemented a regulated polarization variance parameter to list both the effects of the substance released on the ocean surface and the relative concentration of the material in the spill, which demonstrates that radar imaging may incorporate knowledge of the included HNS. In particular, one can distinguish a product that makes up a film at the top of the surface of the sea from another that combines with seawater, information that is serious for effective cleanup procedures. In [35] the normalized polarization difference (NPD) was developed as a metric to differentiate pollutants but it is not sufficient to avoid the hazards of these items.

In [36] they found the hybrid-polarimetric synthetic aperture radar (SAR) data points of oil on the surface of the ocean and believed that we could design a system capable of distinguishing between mineral oil, plant oil, and clean water. For SAR images of ocean surfaces, data set changes are usually caused by deviating wind rates and accident directions that directly affect the backscatter strength. Several classifiers, domain adaptation plans, and multilooking policies are estimated. The data of the hybrid-polarimetric SAR were falsified from quad-pol images of the Radarsat-2. Here, although they have used the compact polarimetric CL-mode data structure to categorize oil points on the surface of the ocean. Most sets of features, classifiers, domain adaptation strategies were not interested in avoiding or preventing the spill of these gasses.

In [37] Transfer and sending of oil spill resources addressed and demonstrated that the spill resources are an essential part of the emergency response system for marine oil spills. Balanced choice of locations for resource storage and transportation roads plays a vital role in ensuring timely and effective response to oil spill accident. In this paper, a multi-objective resource shipping model that reduces the number of storage spaces that are available for response as well as the maximum response time taking into account resource value. There is also a solution algorithm. The practicality and usefulness of the proposed approach is proven by a statistical experiment. They develop the dual objective emergency scheduling model under multiple resource mix with the target of shortest emergency dispatch time and minimum emergency savings points. Finally, this article provides calculations of this model and an example to validate the model, but it focuses solely on emergency services for one incident point not multi-accident point and transportation of these resources to multi-accident points as many accidents occur concurrently.

In [38] they present the development of control-law pathway planning methods for an autonomous surface vehicle (ASV) capable of delineating the oil spill while deploying bacteria and nutrients capable of

controlling and sustaining the spread of oil spill in cooperation with an automotive unmanned aerial vehicle (UAV). In Gazebo, an oil spill simulation scenario was developed to help the estimate of the supporting activities between the ASV and UAV, and to deduce the planning of the ASV route for each of the suggested control law methods. From the methodologies examined, it became apparent that the one that provided the best way to mitigate oil spills was the methodology that uses ordinary trajectories to measure a new and distended contour, and then the points from that contour are transferred over a probable fields algorithm that uses them as successive targets.

In [39] They typically used six types of sea spectra, i.e. The uniform radar cross segments are measured by small perturbation method (SPM), two scale model (TSM) and small slope approximation (SSA-1), elfouhaily, hwang, romeiser, apel, fung and pierson spectra. At the same time, to measure better the precision of unlike sea spectra and to prepare an evaluation between mathematical calculations and realistic CMOD5 for various incident angles, wind speeds and wind directions. The results show that in some specific cases the NRCS, measured using the Romeiser range, is in stronger agreement with CMOD5. In [40] a novel location algorithm is suggested based on the attenuation of the negative pressure wave (ANPW) to accurately identify where a spill accident occurred within it. The ANPW technique dodges the possible difficulties of the conventional NPW technique such as specifically determining the time variance and NPW's velocity anxiety by the tube's fluid motion rate. With the largest location error of 1.161 percent and the smallest error of 0.355 percent in the real water pipeline, the ANPW technique can successfully discover and locate the pipe outflow. They used two sensors; a wavelet transform system used to reduce the noise effect that happens when the pipe begins spilling and improve the precision of the measurement.

In [41] a tethered underwater robot (TUR) is offered for underwater container anchor extraction. In the sea oil and petrol environment, this has produced actual thoughtful horror for container proprietors and thus the goal of this study to improve TUR that could be used by container agents instead of divers to extract the attached anchor deprived of any loss. The application was executed and the sample system verified for testing in the 6 meter distance swimming-bath at the University of Port Harcourt. In swimming and extracting built anchor underwater the robot achieved very perfect results.

3. DEEP LEARNING ALGORITHMS

Deep learning is a new field of machine learning research that was introduced with the aim of moving machine learning closer to one of its original and preliminary goals, such as artificial intelligence. It is about multi-stage education of representation and abstraction that helps to understand data such as sound, such as images and text as identified in [42]. Deep learning helps us to teach machines how to complete and achieve challenging tasks without programming them. We're entering the age of machine learning and artificial intelligence. Deep learning methods are those that can overcome a variety of problems through deep learning.

3.1. Artificial neural networks (ANN)

In [43] (ANN) is a non-parametric, experimental threat minimization based modeling technique with the ability to approximate any non-linear function to arbitrary and tyrannical precision, depending on the training of the network neurons to adjust the weights connecting these neurons, and is typically used for device security and protection estimation. ANN has been successfully applied to deficiency estimation in many fields but there are many drawbacks, such as non-convex objective function, difficulty in measuring the amount of hidden layers as well as over fitting, which arise due to the huge number of parameters in the model and is a major and significant weakness of the theory of experimental hazard minimisation.

3.2. Convolutional neural network (CNN)

In all these researches [44-46] (CNN) is a deep learning technique specifically designed to identify and recognize pictures. It is built with the presence of multilayer neural networks. CNN is ideal for identifying two-dimensional figures and studying organizational structures, and offers a means of automatically separating features from pixels. The little training time makes the use of multilayer neural networks simple and retrieves the precision of recognition. The extensive use in the sorting and recognition of photographs has shown that CNN provides acceptable results in handwritten identification. CNN is also used for separating images.

Faster R-CNN has a district application network that provides the positions in the photo that have advanced possibilities of having an object, and a classifier that makes all of those objective applications as one of the classes in the learning dataset [47].

4. APPLIED DEEP LEARNING ALGORITHMS ON OIL SPILL INCIDENTS

As mentioned before oil spill is an important issue to speak about as it include human life health, climate changing, water and air pollution, and fishing life in the sea or in any source of water that include oil operations. For protecting these important lives a powerful techniques are needed to prevent like accidents, so deep learning is the powerful technique for solving these problems nowadays.

An equivalent structure for the novel application of supporting vector machine (SVM) and ANN techniques was suggested for the vulnerability valuation of the urban buried gas pipeline network, and an evaluation was made on different phases between these two techniques. Sample data needed for model development were simulated and distributed into two sets of data for model training and confirmation. As an outcome, ANN is more complicated than that for SVM and this makes ANN clearly over-fitting, SVM's training results are well matched with the desired outputs than ANN, and when applied to unidentified cases, the SVM model can prod satisfactory production values and is more accurate than the ANN model as shown in [43].

In [48] a popular methodology such as CNN has also used a basic discrimination analysis to describe the selected features subgroup to categorize unstructured data. In the C-band polarimetric mode, the features studied include entropy, alpha, and single-bounce eigenvalue relative difference (SERD). We also suggest a novel technique for SAR image discrimination on oil spills and lookalikes. The classification accuracy achieved through the use of 900 test data samples is 91.33%. It is here as a result detected that not only can the suggested technique accurately recognize the black spots on SAR images, but also confirm the suggested algorithm's ability to categorize unstructured features. The result also shows if the change in sea circumstances (such as climatic, geographical, sea temperature, and environmental conditions) between test and training data is too enormous, classification accuracy would be a huge fall. To reduce the effects of those influences on future experiments, for the construction of the CNN model, more oil spill data from dissimilar marine regions will be used and the strength of the training structure of the proposed technique will be increased. If for the classification result the previous possibilities of oil spills and lookalikes are taken into account, the classification precision would definitely be improved.

In [49] Using the artificial neural network (ANN), they discovered oil spill regions from high-resolution optical images by operational conquest of austere sun shine results. A directional median filter (DMF) has been developed to allow this, and its use has been compared to that of a conventional low-pass filter. A presentation test was shown using a KOMPSAT-2 image developed as a result of oil spill accidents which occurred in the 2010 Gulf of Mexico. The suggested technique involved two main phases: (1) using the DMF, the sun shine effects caused by the ocean waves were changed and (2) the ANN method was used to discover the area of oil spill. The outcomes display the next: (a) The constructed DMF, which takes into account the size and angle of ocean waves, has been great and clever in manipulating the effect of sun shine in a high-resolution optical image; and (b) oil spill regions have been effectively discovered using the suggested technique of the ANN method. The oil spill area was classified separately using the receiver operating characteristic (ROC) curve and detection probability (POD) measurements, with precisions of about 98.12 percent and 89.56 percent. This results show that, compared with the standard detection algorithm, the precision of the suggested technique is improved by about 9 percent.

In [50] In SAR images focused on convolutionary neural network (CNN), they proposed an oceanic phenomenon exploration technique. Next, ResNet-50 is used by the technique to remove multilevel functionality. Secondly, to extract multiscale functionality, it uses the atrocious spatial pyramid pooling (ASPP) module. Finally, to explore oceanic phenomena it incorporates multilevel features and multiscale features. The SAR images collected from the satellite Sentinel-1 are used to establish an oceanic phenomenon study dataset. The suggested methodology can be effective on the dataset with 91 per cent precision.

In [51] the analysis matches previously observed responses to irregular sound event detection (SED) on the structure of the characteristic SED pipeline ingredients. The system's performance on a lone and multi-class base was estimated. It turned out the perform on lone class is likely not to be the same and differentiate between methodologies. Performing the small aberration in lone class would designate a multi-purpose technique that is not predisposed to a certain kind of outcome. The methodology is therefore considered to be improved for a greater range of SED complications. The greatest practical methodology is the mixture of making characteristics used as log-mel energies in convolutional recurrent neural network (CRNN) with long short term memory (LSTM) with a confirmation phase of thresholding has found 93.1% F1 score and 0.1307 ER.

5. CONCLUSION

Human life is the most important thing to protect it, as the importance of human life also living creatures as Birds or Fish or any creature that live under the water or fly in the sky are so important to make life be continue. Oil spills cause a lot of harms and disasters for these lives, so it's so important to interesting in this problem. A lot of researches speak about handling that after the occurrence of the accident but it's so sensitive to avoid such a problems. Detecting reasons of these incidents and avoiding it consider the most important issue nowadays. By using a powerful technique such as deep learning techniques, predicting these problems and avoid it can occurred. In the end of that research will improve the performance of forecasting spill incidents to lead humanity to a safe world than before and to let people work in such a field or living near digging locations to be more safe and disappearing of accidents or reducing it will make them Reassured. As a future work after predicting the accident a similarity algorithms or similar advance techniques can give the best solution for dealing with that accident according to its type.

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