SURVEY ON DIGITAL FARMER INSURANCE CLAIMING

[1]Mrs Supriya, [2]Bharath kumar C, [3]Chandan kumar M, [4]Chetan S
[1]Professor, [2,3,4]students
Dept of CSE
East West Institute of Technology
Bengaluru, India

Abstract— Introduces a pioneering strategy to address the pressing issue of farmer suicides by harnessing advanced technologies. The approach integrates three pivotal features for early prediction, forming a comprehensive solution to the multifaceted challenges faced by farmers. Firstly, the system employs Convolutional Neural Networks (CNN) to detect leaf diseases, enabling the identification of plant health issues. This not only aids in preserving crop yield but also serves as an early indicator of potential distress for farmers who heavily rely on their agricultural produce. Secondly, the project utilizes YOLOv5 for animal intrusion detection, safeguarding crops from unexpected threats posed by wildlife. This feature contributes to migrating economic losses for farmers and ensures the protection of their livelihoods. Lastly, flood detection using YOLOv5 enhances the system's capability to anticipate water-related threats, providing farmers with early warnings to safeguard against crop damage and potential financial setbacks. By integrating these cutting-edge methods into a real-time monitoring platform, the system aims to proactively alert both authorities and farmers to potential crises, empowering them to respond swiftly and efficiently, ultimately reducing the alarming rates of farmer suicides.
Furthermore, this multi-feature approach not only addresses immediate threats but also fosters agricultural sustainability. The real-time monitoring platform provides farmers with a tool to make informed decisions and respond promptly to emerging challenges.

Keywords—component, formatting, style, styling, insert)

1. INTRODUCTION

Our project emerges at the intersection of advanced technologies and the critical socio-economic issue of farmer suicides. With the agricultural sector being a cornerstone of many economies, the alarming rates of farmer suicides underscore the need for innovative solutions. This project endeavors to pioneer a transformative approach by integrating three key features into a unified system. The first facet involves leveraging Convolutional Neural Networks (CNN) for the early detection of leaf diseases, thereby addressing crucial plant health issues. By providing farmers with a tool to identify and manage crop diseases promptly, the system aims to enhance overall agricultural productivity and, in turn, alleviate economic pressures on farmers.

The second component focuses on utilizing YOLOv5 for animal intrusion detection, serving as a protective shield for crops against the unexpected threats posed by wildlife. Agricultural sustainability is intricately linked to the ability to safeguard crops, and the project aims to empower farmers by mitigating economic losses and fortifying their livelihoods. Lastly, the incorporation of YOLOv5 for flood detection enhances the system's capability to anticipate water-related threats. This proactive measure not only assists in minimizing crop damage but also contributes to overall risk management for farmers. By integrating these cutting-edge technologies into a real-time monitoring platform, the project seeks to provide farmers and authorities with actionable insights to respond swiftly to potential crises, ultimately reducing the distressing rates of farmer suicides.

In essence, the project's innovative approach aims to go beyond conventional agricultural practices, transforming them into a technologically advanced, holistic system that addresses the multifaceted challenges faced by farmers. By combining early disease detection, animal intrusion prevention, and flood anticipation, the project aspires to reshape the agricultural landscape, fostering sustainability and resilience while significantly improving the well-being of farmers.

Project domain is situated within the broader domain of precision agriculture and agricultural technology.

A. INTRODUCTION TO DOMAIN

Agriculture, a sector fundamental to global food security, faces numerous challenges, including the devastating impact of crop diseases, wildlife intrusions, and environmental

hazards. The rise in farmer suicides underscores the urgent need for innovative technological solutions to address these challenges comprehensively. In the domain of precision agriculture, cutting-edge technologies such as Convolutional Neural Networks (CNN) and YOLOv5 have demonstrated remarkable potential in enhancing crop monitoring, disease detection, and risk mitigation. This project strategically positions itself at the nexus of agricultural technology and mental health, aiming to leverage advanced features to proactively address the multifaceted threats faced by farmers. Precision agriculture, characterized by the use of technology to optimize farming practices, has evolved as a pivotal domain in contemporary agriculture. The integration of CNN for early detection of leaf diseases exemplifies the domain's commitment to maximizing crop yield through data-driven insights. Similarly, the project aligns with precision agriculture principles by employing YOLOv5 to detect animal intrusions and anticipate flood risks, showcasing the potential of technology to safeguard crops from both biotic and abiotic threats. In exploring these intersections within the domain, the project strives to contribute to the ongoing discourse on the role of technology in transforming agriculture into a more resilient and sustainable endeavor.

As the global agricultural landscape undergoes rapid technological advancements, this project seeks to propel the domain forward by offering a holistic solution to the challenges faced by farmers. By addressing not only immediate threats to crop health but also considering the broader implications for farmers' mental well-being, the project underscores the importance of a comprehensive approach in precision agriculture. As technology continues to play an increasingly crucial role in shaping the future of agriculture, this project contributes to the ongoing dialogue on leveraging innovation to enhance the sustainability and socio-economic resilience of farming communities.

II. LITERATURE SURVEY

The survey conducted for this study is summarized in a tabular format, providing a comprehensive overview of relevant research works. The table encompasses crucial details such as the name of the study, author(s), publication year, research objectives, and key advantages and disadvantages identified in each work.

Title	Authors	Year	Objectives	Advantages	Disadvantages
PREDICTION ANALYSIS OF FLOODS USING MACHINE LEARNING ALGORITHMS (NARX & SVM)	Nadia Zehra*	2020	This report was aimed at the meta-analysis of previously reported articles in the context of flood forecasting and the techniques targeted were the SVM and NARX. NARX is a type of NN and is widely used in terms of time series prediction. Based on the comparison, literature review and synthesis stated above, it is concluded that use of statistical methods with NARX can provide highly accurate and promising results for flood forecast. This study was quite helpful in elaborating the mechanism of those proposed techniques and their comparison.	Prediction Accuracy: Both NARX and SVM are capable of capturing nonlinear relationships within the flood data, allowing them to make accurate predictions even with complex and dynamic floodpatterns. Handling Nonlinear Relationships: NARX models, specifically designedfor time-series data, canefficiently model and predictthe nonlinear dynamics offlood patterns, considering historical data and exogenousvariables like rainfall,river flow, etc	This report was aimed at the meta-analysis of previously reported articles in the context of flood forecasting and the techniques targeted were the SVM and NARX. NARX is a type of NN and is widely used in terms of time series prediction. Based on the comparison, literature review and synthesis stated above, it is concluded that use of statistical methods with NARX can provide highly accurate and promising resultsfor flood forecast.
A REAL-TIME FLOOD DETECTION SYST EM BASED ON MACHINE LEARNING ALGORITHMS WITH EMPHASIS ON DEEP LEARNING	Abdirahman Osman Hashi#1, Abdullahi Ahmed Abdirahman #2Mohamed Ab dirahman Elmi#3, Siti ZaitonMohd Hashi*4, Octavio Ernesto Romo Rodriguez5	2021	Systems for flood detection have beendeveloped as an immediate response to inform the corresponding authorities before the event happens. It will keep the authorities updated about the current water levels by means of the Arduino sensor network, which will then provide an SMS notification if there is adangerous situation through the GSM modem. In order to classify the data, four machine learning methods were used	Early Detection: Machine learning algorithms, particula rly deep learning models, can detect flood related patterns and anomaliesin data streams or satellite images quickly, enabling early warnings and rapid response, which are in migrating floodimpacts. High Accuracy: Deep learningmodels, such as Convolutional Neural Networks (CNNs) or Recurrent Neural Networks (RNNs), can learn intricate patterns and relationships in com detection compared to traditional methods.	Data Availability and Quality: Obtaining label datasets for training deep learning models in flood detection might be challenging due to the scarcity of label flood data. Moreover, data quality, including issues like noise, incompleteness, or biases, can affect the model's performance. Computational Resources: Training and deploying deep learning models, especially large-scale ones, require substantial computational resources like high- performance GPUs or TPUs. This might limit the system's feasibility in resource-constrained or remote areas.

IOT BASED EARLY FLOOD DETECTION USING MACHINE LEARNING	Rameshh Byalib P Bindu Divya Supraja V Maskikard Chitrashree Sanjana H Bhonsle	2022	It is impossible to predict how and when the Natural Disasters occur. The cause for Natural Disasters depend on various factor for example Water level in water bodies, Rainfall etc. In this project we have considered the water level in dams, flow of water and also rain fall detection by installing various sensors, so that continuous monitoring of water level, water flow and occurrence of rain is done, if the threshold value of sensor gets exceeded an intimation about the flood is sent.	Data Reliability and Quality: Dependence on sensor data for flood detection may lead to inaccuracies due to sensor malfunctions, data noise, or calibration issues. Inconsistent or erroneous data can impact the accuracy of machine learning models. Cost of Deployment: Setting up and maintaining IoT infrastructure, including sensors, communication networks, and data processing systems, can be expensive, especially in remote or underdeveloped areas with limited resources.	Data Reliability and Quality: Dependence on sensor data for flood detection may lead to inaccuracies due to sensor malfunctions, data noise, or calibration issues. Inconsistent or erroneous data can impact the accuracy of machine learning models. Cost of Deployment: Setting up and maintaining IoT infrastructure, including sensors, communication networks, and data processing systems, can be expensive, especially in remote or underdeveloped areas with limited resources.

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DETECTION OF ANIMAL INTRUSION USING CNN AND IMAGE PROCESSING	K Bhumika G Radhika CH Ellaji	2022	The approach performed responds to animal intrusion on the farming fields. When the animal is detected upon intrusion, then an alert notification is sent to the farmer immediately. The animal captured is predicted through CNN. LBP and X boost are used for the feature extraction of the image for the prediction. Through this crop damage can be reduced. The dataset is collected from Kaggle. The prediction obtained through this model is with better accuracy and satiable result.	Feature Learning: CNNs excel at learning hierarchical representations of images, automatically extracting relevant features from raw image data without the need for handcrafted features. This capability helps in detecting complex patterns in animal appearances. High Accuracy: CNNs, when properly trained with sufficient and diverse data, can achieve high accuracy in identifying animals, making them effective for intrusion detection tasks.	Data Requirements: CNNs often demand large amounts of label data for effective training. Collecting and annotating extensive datasets containing diverse environments, species, and lighting conditions can be laborious and expensive. Computational Complexity: Training deep CNNs requires significant computational resources, including powerful GPUs or TPUs. Deploying and maintaining such systems might be challenging, particularly in resource-constrained environments.
MULTI-CLASS CLASSIFICATION OF PLANT LEAF DISEASES USING FEATURE FUSION OF DEEP CONVOLUTIONAL NEURAL NETWORK AND LOCAL BINARY PATTERN	Khalid M Hosny, Walaa M.El-Hady,	2023	Accurate, with few parameters, s, and high calculation speed CNN model is developed. Furthermore, a feature-fusion based method for classifying plant leaf diseases is proposed. The proposed method enables deep features to be fused with handcrafted features extracted by LBP The proposed model used three public Plant Village datasets (Apple Leaf, Tomato Leaf, and Grape Leaf datasets) for the training and testing.	Texture and Spatial Information Fusion: CNNs excel at learning hierarchical features from images, capturing abstract representations. However, they might miss fine texture details crucial for disease identification. LBPs, on the other hand, are effective in encoding local texture information. By fusing both, you leverage CNNs' ability to learn global features alongside LBP's local texture details, offering a comprehensive view.	Complexity and Computational Cost: Integrating different feature extraction methods like CNNs and LBPs can increase the complexity of the model. This complexity might require more computational resources and memory, making the training and inference phases moreresource-intensive.

DX-Flood Line: End-To-End Deep Explainable Pipeline for RealTime Flood Scene Object Detection From Multimedia Images	Nusruth HUMAIRA VIDYA S. SAMADI NINA C. HUBIG	2023	Imminent disaster response systems have continued to advance with plethora of technological innovations over the years to counter ongoing climate and landscape across the globe. Live monitoring video cameras, satellites, and social media, all contribute to the collection of real time data and advances in computer science makes timely, preciseresponse possible.	Real-Time Detection: The focus on real-time detection implies quick processing, essential for scenarios like flood management where timely action is crucial. Deep learning pipelines, when optimized, can efficiently process multimedia images and provide rapid insights. Object Detection Accuracy: Deep learning-based object detection models, when well-trained, can achieve high accuracy in identifying objects.	Complexity and Integration: Integrating different stages of data preprocessing, multiple neural networks, and explain ability modules within an end-to-end pipeline can increase its complexity. Ensuring seamless integration and proper communication between these components might be challenging and could lead to potential bottlenecks or errors.

III. CONCLUSION

the project "Digital Insurance Claiming" has pioneered an innovative solution by integrating cutting-edge technologies like Convolutional Neural Networks (CNN) for leaf disease detection and YOLOv5 for animal intrusion and flood detection. This comprehensive system offers a proactive approach to address the intricate challenges farmers face, aiming to reduce the incidence of farmer suicides by early threat detection and timely alerts. By combining predictive algorithms with real-time monitoring, this project not only safeguards crop yields but also prioritizes the mental well-being of farmers. The implementation of a user-friendly interface further empowers farmers and authorities to act swiftly in response to potential crises. As this initiative progresses, continual refinement and community-wide deployment will be pivotal, marking a significant stride in supporting the agricultural community and combating the distressing issue of farmer suicides.

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[2] Nadia Zehra* Department of Computer Sciences, Allama Iqbal Open University, Islamabad, Pakistan Email: nzee2001@hotmail.comK. Elissa, “Title of paper if known,” unpublished.

[3] Abdirahman Osman Hashi#1 , Abdullahi Ahmed Abdirahman#2 , Mohamed Abdirahman Elmi#3, Siti Zaiton Mohd Hashi*4, Octavio Ernesto Romo Rodriguez5 #Faculty member, SIMAD University, Department of Computing, Mogadishu, Somalia Department of Artificial intelligence and Big Data, Faculty of Computing, University Malaysia Kelantan Kelantan, Malaysia Department of Computer Science, Faculty of Informatics, İstanbul Teknik Üniversitesi, İstanbul, Turkey 1wadani12727@gmail.com, 2 aaayare@simad.edu.so, 3m.abdirahman@simad.edu.soY. Yorozu, M. Hirano, K. Oka, and Y. Tagawa, “Electron spectroscopy studies on magneto-optical media and plastic substrate interface,” IEEE Transl. J. Magn. Japan, vol. 2, pp. 740–741, August 1987 [Digests 9th Annual Conf. Magnetics Japan, p. 301, 1982].

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[5] K Bhumika * , G Radhika and CH Ellaji Department of Computer Science and Engineering, School of Engineering and Technology, Sri Padmavathi mahila university (Tirupati), India. World Journal of Advanced Research and Reviews, 2022, 16(03), 767–774 Publication history: Received on 09 November 2022; revised on 20 December 2022; accepted on 23 December 2022

[6] Vidhyalatha T. Y Sreeraman . E Purushotham Department of Computer Science and Engineering Sreenivasa institute of technology and management studies, Chittoor, India. Received: 18 October 2022 / Revised: 30 October 2022 / Accepted: 13 December