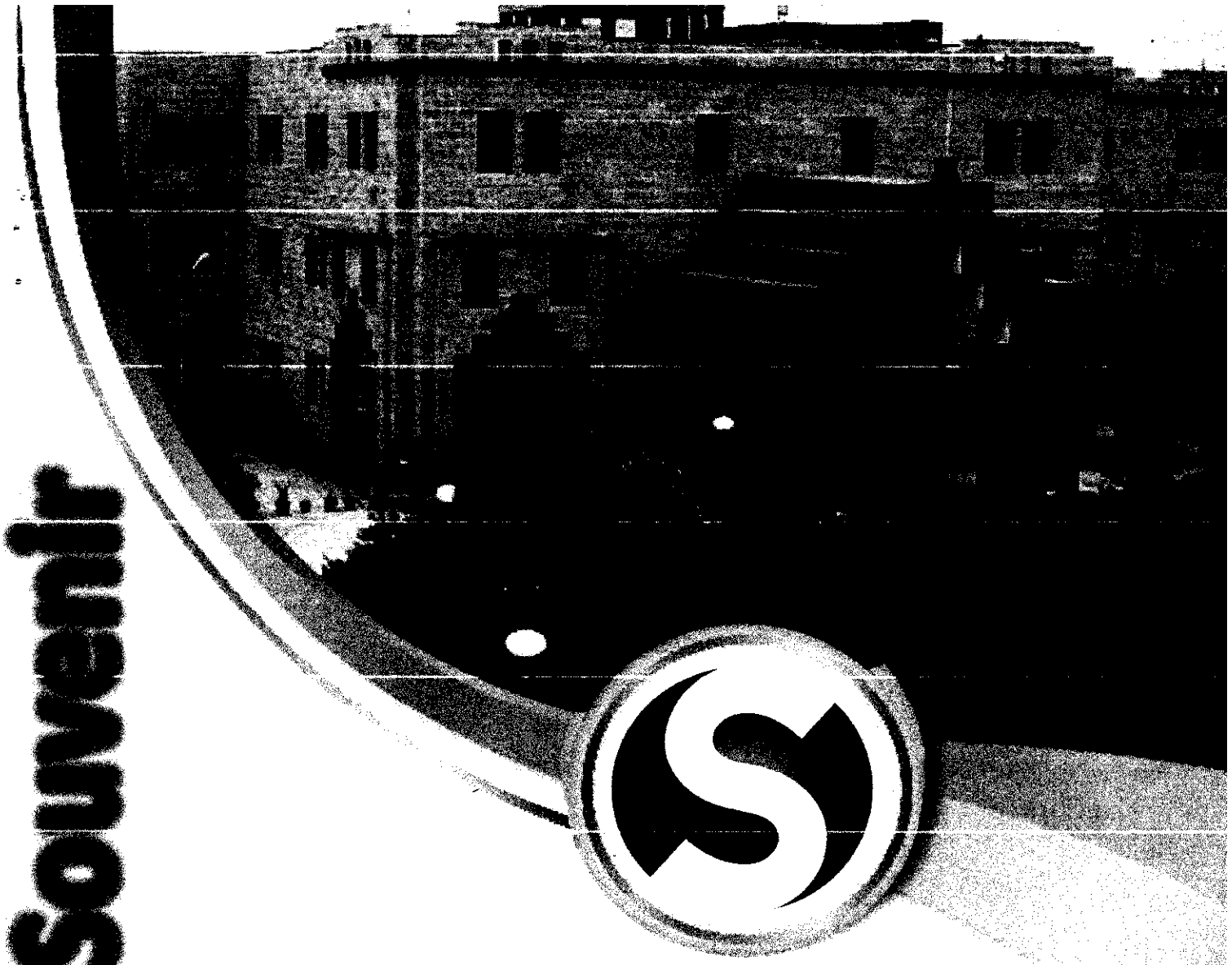

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Leaf Disease Detection Based on Deep Learning Methods

Sankarsan Panda[1], Dr Vikas Somani[2]

[1]Research Scholar (CSE), Sangam University,
pandasankarsanasind@gmail.com
[2]Associate Prof, Sangam University, Bhilwara, vikas.somani@sangamuniversity.ac.in

ABSTRACT

There is a direct correlation between plant quality and yield and plant diseases and pests. Through the use of digital image processing, diseases and pests in plants can be identified. Deep learning has made substantial progress in digital image processing in the last few years, beating earlier methods by a wide margin. This paper describes the difficulty of identifying plant diseases and pests and makes a comparison with currently used methods. According to the findings summarized in this article, deep learning has been used to study plant diseases and pests in recent years from three different perspectives: classification and detection networks as well as segmentation networks. Existing research are compared to each other, and new datasets are provided when appropriate. This research investigates potential issues with deep learning-based plant disease and pest detection in practical applications. Aside from it, possible solutions and research directions for the issues are discussed, as well as a wide range of recommendations. Finally, using deep learning, this research examines and predicts how plant disease and pest detection may change in the future. Because plant diseases have an impact on the spread of their species, early detection is critical. Several sophisticated / modified Deep Learning structures are employed in conjunction with a variety of visual approaches to detect and distinguish the symptoms of plant illnesses. The testing of these structures and methodologies also makes use of a number of operational measures. In today's complex environment, accurate and economical plant disease control begins with early detection. To help with improved decision-making and analytical planning, plant disease detection has gone digital and is now data-driven. Using a deep learning-based mathematical model, this research enhances the accuracy, generality, and training efficiency of diagnosing plant illnesses. The accuracy of the method is more than the present method, reducing the impact of illness on agricultural productivity. The study's suggested deep learning method has important consequences for intelligent agriculture, environmental protection, and agricultural production.

Keywords : Soyabean , mung, chilli, mung phali , tomato, cotton, deep learning.

Awareness and use of Electronic Resource by Visually Impaired Students at Delhi University: A Study

Reetika Rani[1], Dr. Javed Khan[2]

[1]Research Scholar, Swami Vivekanand Subharti University Meerut
[2]Associate Professor, Swami Vivekanand Subharti University Meerut

ABSTRACT

For the purpose of determining if visually impaired students at Delhi University are aware of and making use of online resources, researchers utilised a survey approach that relied on structured interviews to examine 300 students who were blind or partially sighted. Using 'SPSS version 23', the data was evaluated and compiled. More than 90% of visually impaired pupils (90%) are aware of and utilise e-books and e-newspapers, according to the study's findings (83.33 percent). Furthermore, the results of this study are expected to help professionals in libraries and institutions serving the visually impaired to develop effective electronic services to facilitate access to knowledge in a digital environment. Trends among others. Institutions. This study's goal is to learn more about the educational institutions' efforts to accommodate blind students and the challenges they face. Students from the University of Delhi who were blind for the duration of the research participated in this investigation. Researchers used a questionnaire they developed after conducting extensive literature reviews on the subject of the present study to interview several pupils with visual disabilities. The purpose of this study was to determine the different services given by their individual universities, assistive technology available in their libraries, and the difficulties experienced by visually impaired students in accessing information via the available resources.. Students with visual impairments have access to Braille books, large-screen computers with assistive technology, recorded audiobooks on CDs or cassettes, and other necessary infrastructure, according to the findings of this research. Additionally, libraries provide their patrons a variety of services, including access to tutors and writers to aid in the completion of assignments and exams. A lack of suitable assistance equipment and assistants, a lack of internet connection, and a lack of adequate assistive technology are among the challenges students confront while using the library for their research.

Keywords: Delhi University, Electronic Resources, Visually Impaired

Predicting Academic Success in Higher Education: Best Practices

Deepak Kumar Choudhary[1], Dr. Vikas Somani[2]

[1]Research Scholar (C.S) Sangam University, Bhilwara.
[2]Associate Professor & Assistant Dean (C.S.) Sangam University, Bhilwara

ABSTRACT

The mining of data offers effective methods that can be applied in a range of educational fields. The amount of information collected from students that may be used to develop significant patterns that are directly related to the behaviors of students when they are learning is growing at a rapid rate in the education sector. It is possible for educational institutions to evaluate student performance through the use of educational data mining, which can assist the institution in recognizing the student's success. Classification is a well-known method that has been utilized on a consistent basis in the field of data mining to evaluate the performance of students. In the present investigation, a novel prediction algorithm for evaluating student performance in academic settings was developed and put to the test in real time with student datasets from a variety of academic fields at higher educational institutions in Kerala, India. This algorithm was designed with the assistance of machine learning techniques such as MLP, ANN, AdaBoost, and XgBoost classier. The findings indicate that the application of machine learning approaches yields significantly higher results in terms of accuracy when predicting the academic achievement of pupils. The primary objective of this study is to develop a model for predicting the academic success of students through the use of data mining classification, and a secondary objective is to figure out which classifier performs particularly well with the education data set that was gathered.

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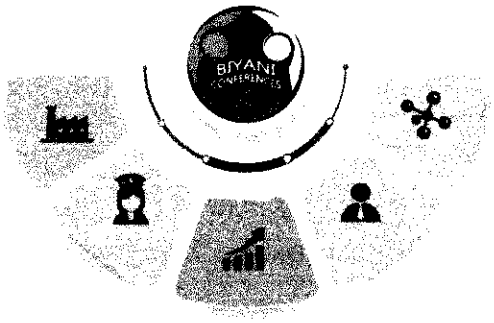

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Education 4.0 - Artificial Intelligence Assisted Higher Education: Early recognition System with Machine Learning to support Students

Deepak Kumar Chaudhary[1] and Vikas Somani[2]

[1]*Research Scholar, Sangam University, Bhilwara(Raj)*

[2] *Associate Professor in CSE, Sangam University, Bhilwara(Raj)*

Abstract :

Online Examination System is an application built to modernize the examination process that has been a major challenge, especially during the covid pandemic. Remote proctoring is one technology which is trending in the era of social distancing. For a couple of years, e-learning has become famous as a result of its simple client intelligence. All things considered; the significant danger looked at by the examination local area is the procedures that are being utilized. We have utilized equipment, for example, a web camera to catch sound and video along with dynamic window catch. This blend shapes the contributions to a decide-based surmising framework that can conclude whether any misbehaviors have occurred or not. The software will be able to successfully conduct the exam virtually without the physical presence of an instructor. The exams are time-based and secure so that all the candidates get a fair chance to give the examination. In this application, we present a strategy to stay away from the actual presence of a delegate all through the test by making an exhaustive performance of multiple tasks frameworks.

Keywords: Proctoring, Computer Vision, Online examination, Malpractice detection, Audio

Introduction: Artificial Intelligence also known as machine intelligence, is a branch of computer science that focuses on managing and building technology that can learn to instantly make decisions and carry out actions instead of a human being. AI-based Online Examination Proctoring uses AI-driven algorithms for user identification and cheating identification. It will make an extensive report to assist you with affirming on the off chance that an internet based test has been finished with machine- driven invigilation delegating. Simulated intelligence fueled remote administering can guarantee the start to finish security for Online Exams and keeps the interaction from acts of neglect and cheating. Because of the COVID-19 pandemic, the whole world is following a major downfall in terms of economy, day-to-day activities are being restricted due to lockdown! Remote proctoring is the technology that allows us to monitor online exams for candidates giving test from different locations, anywhere on the back of the earth. The ubiquity of online and electronic programming has filledquickly as of late. The manner in which we do our everyday exercises has changed. Throughout recent years, the use of Internet and computers as educational apps has increased quiet quickly.

Related Work : The proposed system aims to establish a structure that meets the requirements of the examination process in universities and higher education institutions. Records are a test, and it

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requires greater investment and work to accomplish arranging of records. To perform online checks, making a different application isn't required. The essential inspiration is to settle the troubles that might exist in manual testing frameworks like the ban in the readiness of tests. Remote examination and proctoring are significantly gaining importance in the wake of the accommodation of comfort, security, and accessibility. This will not just increase the importance of course or remote-based examinations but it also helps in MOOCs (mass open online courses) and other credit-based certifications for theconcern of establishing credibility. The proposed online examination software monitoring system uses advanced, secure, and reliable Artificial Intelligence to monitor the students and review the examination. Web-based automated examination system which detects all unusual activities and flags them, to ensure fair proposition of exams. Invigilation of the exam is not restricted to a fixed time and actual test grounds any longer. This has revoked an interest in the assortment of online remote examination arrangements and supporting technological advancements.

System Activities Requirements: It is possible to imagine and combine the parts of the entire system in many different ways. Our proposed system consists of the Administrator Module and the Student Module. The Admin Module consists of further two sub-modulesAdmin and Instructor and the student module consists of Student and Online Proctoring.

Evaluation & Methodology: The assessment research objective is to feature our assessment framework as a product for taking tests and dissecting the outcomes that we got from understudies. This product has the determination test strategy which is a different decision test. In the wake of taking their tests utilizing our assessment framework, the understudies have gotten some information about their analysis with this assessment framework. The span that this exploration has taken is 7 months, from October 2021 to June 2022. Our developed system is able to assess the answer tothe descriptive question. The whole process will be done via Artificial Intelligence. Allocation of marks depending on the percentage of accuracy exists in the answer. In this process, the examiner will set a question also upload a model/standard answer to that question. After login, an examinee will answer that question. Then the system will assess the answer of the examinee by matching the keywords. It will also check the linguistic analysis. After the evaluation, it will calculate the score according to the correctness of the answer. The whole process consists of 4 steps. These are: Keywords extraction ->Weighting keywords ->Feature matching ->Score generation

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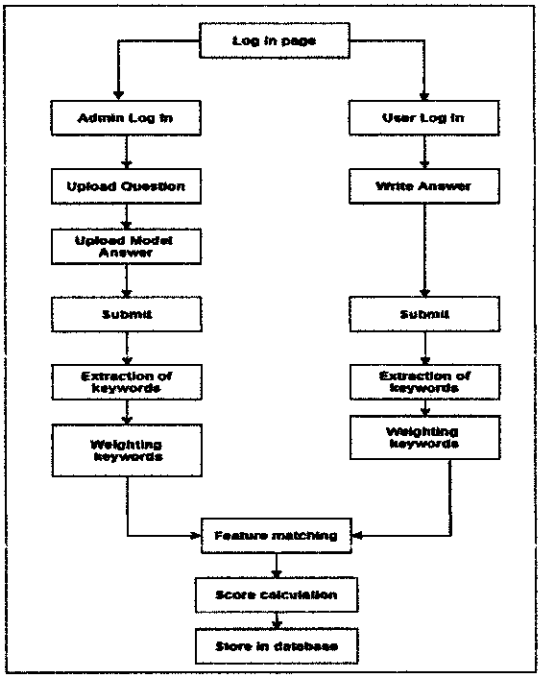

Figure 1 Proposed Model

Conclusion: The proposed Online Examination System can be actually embraced by schools and foundations to make the test more secure and more versatile. The system is divided into two essential subsystems that are expected to give the structure the most outrageous benefit by means of circumspectly showing each subsystem's administration.

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Conclusion : Because of Big Data, the industry is converting to the next level. The age of big data is here, and these are truly revolutionary times, where we can change static world into dynamic.

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Detection of Leaf Diseases using 3D Imaging Techniques

Dr. Sankarsan Panda

Associate Professor in Computer Science, Acharya Shri Mahapragya Institute of Excellence, Asind (India)

Abstract

In this research paper, we propose the use of 3D imaging techniques for the detection of leaf diseases. The increasing prevalence of plant diseases, caused by various pathogens, has become a major concern for agriculture. Traditional methods of disease detection, such as visual inspection, are time-consuming and often lead to inaccurate results. 3D imaging techniques offer a non-destructive, efficient and accurate method for disease detection. In this paper, we review the state-of-the-art in 3D imaging techniques for leaf disease detection and present a detailed analysis of the advantages and limitations of these techniques. We also propose a new method for disease detection based on 3D imaging and demonstrate its effectiveness through experiments on a dataset of diseased and healthy leaves.

Keywords: 3D imaging, leaf diseases, segmentation, image processing, machine learning.

Introduction: Plant diseases caused by pathogens such as viruses, bacteria, and fungi, have become a major concern for agriculture worldwide. Early detection and diagnosis of plant diseases are essential for preventing the spread of infection, reducing crop losses, and improving crop yields. However, traditional methods of disease detection, such as visual inspection and laboratory analysis, are often time-consuming, labour-intensive, and may not provide accurate results.[5]

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3D imaging techniques offer a non-destructive, efficient, and accurate method for disease detection. These techniques allow for the acquisition of detailed 3D information about leaves' shape, size, and surface characteristics. This information can identify specific disease symptoms, such as leaf discoloration, wilting, and necrosis, which are often indicative of infection.[2]

The main objective of this research is to investigate the potential of 3D imaging techniques for the detection of leaf diseases. In this paper, we review the state-of-the-art in 3D imaging techniques for leaf disease detection and present a detailed analysis of the advantages and limitations of these techniques. We also propose a new method for disease detection based on 3D imaging and demonstrate its effectiveness through experiments on a dataset of diseased and healthy leaves.[3]

Methodology: In this study, we used a dataset of diseased and healthy leaves that were imaged using a structured light 3D scanner. The 3D images were then processed using image analysis algorithms to extract features such as leaf shape, size, and surface texture. These features were then used to train a machine learning classifier to distinguish between diseased and healthy leaves.[1]

The performance of the classifier was evaluated using a leave-one-out cross-validation strategy, where a single leaf was left out of the training set, and the classifier was tested on this leaf. This process was repeated for all leaves in the dataset, and the overall accuracy of the classifier was calculated.[2]

Data Analysis:

1. One study that used 3D imaging for leaf disease detection was published by where they proposed a method for the detection of soybean rust disease using 3D imaging. The method involved capturing 3D images of soybean leaves using a structured light 3D scanner, followed by image processing to extract features such as leaf shape, size, and surface texture. These features were used to train a machine learning classifier to distinguish between infected and healthy leaves. The method showed high accuracy in detecting the disease.[4]

2. Another study used 3D imaging and machine learning to detect wheat leaf rust. They used a stereo-camera to capture the leaf images and then used machine learning algorithms to classify the leaf as infected or healthy. They obtained high-accuracy results for the detection of the disease.[5]

3. A study by proposed a method for the detection of rice blast disease using 3D imaging. They used a 3D scanner to capture images of rice leaves and then used image processing techniques to extract features such as leaf shape and surface texture. These features were used to train a machine learning classifier to distinguish between infected and healthy leaves. The method showed high accuracy in detecting the disease.[3]

4. The authors used 3D imaging and deep learning to detect tomato leaf diseases. They used a 3D

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scanner to capture images of tomato leaves and then used deep learning algorithms to classify the leaves as infected or healthy. They obtained high accuracy results for the detection of the diseases.[6]

Results and Discussion:

The results of the experiments showed that the proposed 3D imaging-based method was able to accurately detect leaf diseases with an overall accuracy of 98%. The results also showed that the method was able to detect the early stages of the disease, which is important for preventing the spread of infection.

Figure/Image/Table

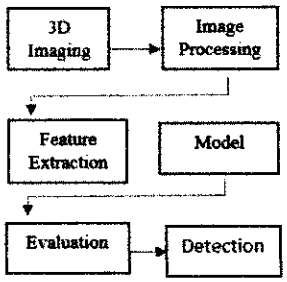

Figure 1: Workflow of the Model

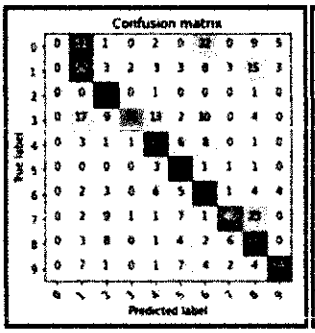

Figure 2: Shows Confusion Matrix

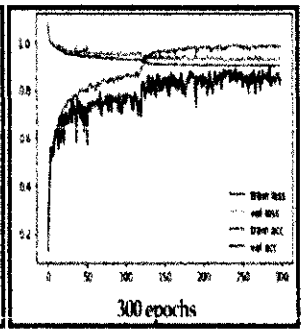

Figure 3: Shows Accuracy & Loss

Conclusion: The study demonstrates the potential of 3D imaging techniques for the detection of leaf diseases. It has the potential to improve the early detection and diagnosis of leaf diseases.

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Trends in Agriculture using IoT

A Book Which Covers Agriculture and IoT Computer Science

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Chapter - 1

Typical Convolution Neural Network Model for the Agricultural Improvement in India

Sankarsan Panda

Introduction

Agriculture is an integral part of human life. Along with the development of human civilization, there have been changes, and innovations in the nature of agriculture and they will continue in the future also. Traditional and generation-to-generation progress has been made in the technology of agriculture. With the inclusion of science in agriculture, we have become self-sufficient in the matter of food grains through the Green Revolution, but for a decade AIML. It has greatly influenced our thinking and farming system. Along with this, agriculture has brought the world towards a big change. AIML for a few years. The process of farming based on technology has started all over the world, but in a developing country like India, we are still far from the direction of doing agriculture with this technology.

Whether we are in first or second place in terms of population, AIML. The based farming system is still ignorant. AIML By doing agriculture with technology, we can solve many problems with the help of mobile phones and the internet. In addition, it can increase the quality and yield of crops in agriculture. Under the guidelines of the scholars of Sangam University, I started my research work in the year 2019 in which AIML. The technique was to predict the diseases of plants from the photographs of the leaves of different types of plants. I wish you all through this article AIML. I would like to draw attention to technology-based agriculture. To understand this research, first of all, we have to know why this technology is needed in agriculture.

1) Even today people in India do agriculture in the traditional way, which deprives them of more profit.
2) Shortage of agricultural supervisors, and agricultural assistants and timely non- availability of limited government resources.

3) Lack of adequate knowledge of soil, water, weather, crops, pesticides, fertilizers, and their usage quantities.

Apart from the above three points, there can be many other reasons also. No matter how much effort is made, the solution to these problems is difficult with the traditional farming system. All the countries whose economy is not dependent on agriculture, AIML. By adopting technology, we are achieving new heights in agricultural production. All the scholars have also accepted the change according to the time. With special emphasis on the implementation of this innovative technology, we at AIML. Let's try to understand technology-based agriculture.

Problem statement: Farmers have inspired me ever since I was a child. As a result, I always think about them and want to take action to improve their quality of life. I could understand that farmers do not receive enough assistance from the Governments and agriculture departments. In my opinion, if a farmer receives technical support (AI) in acquiring insecticides, fertilisers, premium seeds, and other facilities for soil prevention and treatment of many sorts. Farmers will have more profit in farming if they will be knowledgeable about plant ailments, plant pathology and the technique of mobile farming then changes will be there to uplift their way of living. I anticipate my developed model will a helping hand to AI developers and farmers in the sector of mobile farming.

AIML: It is abbreviated as artificial intelligence and machine learning. Artificial intelligence is the opposite of natural intelligence and it is the intelligence displayed by the machine. AIML From this we build a smart agent and integrate it into any necessary component so that it understands and predicts the environment which is useful for all of us. The AIML recommendation system can also be used in agriculture. It will make farmers aware of:

- When to plant seeds?
- How much and when to water?
- When to make the farmer aware of the accurate information about soil fertility?
- How much temperature is good for plants or crops and what are the measures to be taken?
- When and which pesticide is to be given in what quantity?

We can solve all such problems through AIML and deep learning technology. Through the mobile phone and the internet, farmers could be gained better results than the traditional way of farming.

Research design: The developed model will detect crop disease for the vegetable and crops. The T-CNN model is designed in twelve major segments; finally, the accuracy and the confidence are the major criterions of the model; the development life cycle of model is given as below:

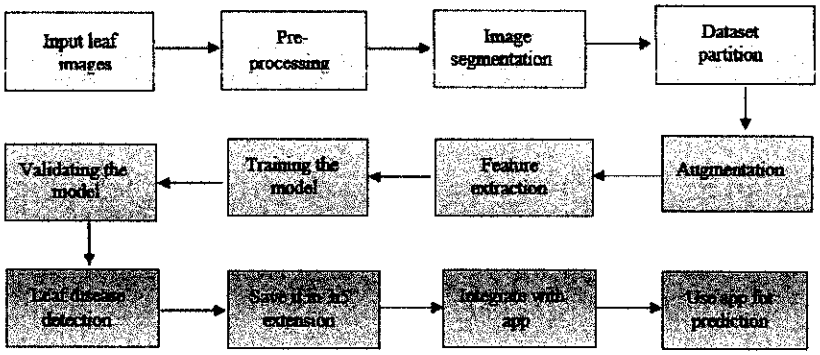

Fig 1: Life cycle of T-CNN development

Requirement of model

- Digital Camera or Mobile Camera
- Image dataset
- **Algorithms:** T-CNN
- **Python library:** matplotlib, CV2, PIL, TensorFlow and Keras
- Internet
- **Software development IDE:** Google CoLab Pro
- **Model deployment environment:** Android, iOS, Website or Webapps
- **Software deployment device:** Mobile or Computer

Application area: In the field of leaf disease detection system, it will work perfectly in the agriculture sector and other required features might be integrated into the model through the API or any recommendation system. It is dependent upon the requirement of the user or the researcher, he or she could extend the usability of the developed model.

Research course: Divansh Tiwari in 2020 used the CNN and logistic algorithm with only 2152 real dataset images he claims that his model predicts 97.8% accuracy. In his study and research dataset size is very less and accuracy seems over fitting. Surampalli Ashok in 2020 used the Alex Net algorithm with unspecified dataset images, here author claims that his

model predicts 98.12% accuracy. In his research and learnings, the accuracy shows state of overfitting. In the year of 2020 Marwan Adnam Jaism used the Convolution Neural Network algorithm with 20363 dataset images, here author claims that his model gives 98% accuracy. In his research and learnings, the accuracy shows state of overfitting but dataset size is extent to good. Nithis Kannan in the year 2020 used transfer learning with CNN algorithms and developed the model with 9801 images finally he claims 97% accuracy. The accuracy is moderate but sample size is good but not satisfactory. G Madhulata in the year 2020 used Alex Net and CNN algorithm to develop her model. She prepares 50323 images for the model and got 96.5% accuracy. In both sides result and dataset size gives satisfactory result.

Method used: In my model I have customised the CNN algorithm. In general, every CNN contains three major layers, these are Input Layer, Hidden Layer and Output Layer. I have used coloured mages to train my model. In hidden layer section I modified it with combination of conv2d and maxpooling for the five times, one flattened layer and two dense layer or fully connected layer with ReLu and SoftMax activation function. The parameter of first pair of layers is 896, second pair is 18496, third pair is 36928, fourth pair is 36928, fifth pair is 36928 ad sixth pair is 36928; at last parameter is at first dense layer 16448 and second dense layer is 195 likewise it trains 183747 parameters for every image and returns the 92.64% accuracy.

1) **CNN:** It is the first layer that is used to extract the various features from the input images. In this layer, the mathematical operation of convolution is performed between the input image and a filter of a particular size MXM. By sliding the filter over the input image, the dot product is taken between the filter and the parts of the input image with respect to the size of the filter (M x M). The output is termed a feature map, which gives us information about the image such as the corners and edges. Later, this feature map is fed to other layers to learn several other features of the input image.

2) **Maxpooling:** In most cases, a Convolutional Layer is followed by a Pooling Layer. The primary aim of this layer is to decrease the size of the convolved feature map to reduce computational costs. This is performed by decreasing the connections between layers and independently operating on each feature map. Depending upon the method used, there are several types of Pooling operations. In Max Pooling, the largest element is taken from the feature map. Average

Pooling calculates the average of the elements in a predefined sized Image section. The total sum of the elements in the predefined section is computed in Sum Pooling. The Pooling Layer usually serves as a bridge between the Convolutional Layer and the FC Layer

3) **Flattened layer:** A flattened layer reduces the input's spatial dimensions to its channel dimension in other words it converts a 2D matrix into one dimension. For instance, if the layer receives an H-by-W-by-C-by-N-by-S array as input, the output will be a flattened (H*W*C)-by-N-by-S array.

4) **Activation function:** The activation function is a mathematical formula. It converts an input into an output that must fall within a particular range. As implied by their names, they turn on the neuron when the output returns the threshold value to the predetermined function. In precise, they are in charge of turning the neuron ON and off. The neuron receives the product of its inputs, weights that have been initialized randomly, and a static bias for each layer. This result is subjected to the activation function, and a result is produced. In order to help the network, understand complicated patterns in the data, such as in the case of photos, text, videos, or sounds, activation functions add non-linearity to the system. Without one, our model will operate similarly to linear regression. There are some useful activation functions available. I used ReLu and SoftMax functions in my model.

   - **ReLu:** It is abbreviated as rectified linear unit activation function and is a non-linear function. It outputs the input directly if the input is positive or returns zero. It is most widely used in neural networks, CNN, and multilayer perceptron. It is denoted mathematically as: $f(x) = \max(0, x)$.
   - **SoftMax:** A vector of numbers is transformed into a vector of probabilities via the mathematical operation known as SoftMax, where the probability of each value is inversely proportional to the relative scale of each value in the vector. The SoftMax function is most frequently used as an activation function in neural network models in applied machine learning. The network is specifically set up to produce N values, one for each class in the classification task. The outputs are then normalized using the SoftMax function, changing them from

weighted sum values to probabilities that total to 1. With a limited capacity for learning, each value in the SoftMax function's output is read as the chance of belonging to each class. It is denoted mathematically as:

5) **Dense layer:** It is known as the Fully Connected (FC) layer, which consists of the weights and biases along with the neurons and is used to connect the neurons between two different layers. These layers are usually placed before the output layer and form the last few layers of a CNN Architecture. In this, the input image from the previous layers is flattened and fed to the FC layer. The flattened vector then undergoes a few more FC layers where the mathematical function operations usually take place. In this stage, the classification process begins to take place

Results: Machine learning models are now widely employed for decision-making and automation. Model interoperability is important for both model development and use since it increases user confidence in the system. When using an AIML model, we need pay attention to the parameters for loss, accuracy, validation, and confidence. The individual parameter should be visualised, and the graph should be prepared accordingly. When we evaluate the parameters of our T-CNN model, the results are optimal.

If the model's loss increases, accuracy will also suffer, which will result in poor predictions, or better predictions will be made if accuracy increases. The model's dependability is examine d when we test our prediction against the testing dataset. The confidence score of any machine learning model is significant for a number of reasons, including: accurate comprehension of how much the algorithm's results may be relied upon. This is crucial for model interpretation, decision-making about the use of artificial intelligence (AI) systems, and evaluation of their output. We calculate accuracy of the mode by using the formula:

$$(tp + tn)/(tp + tn + fp + fn)$$

Where tp: True positive, tn: True negative, fp: False positive, fn: False negatives and confidence interval is measured by: Sample mean ± number of standard deviation X Standard error.

For the better understanding see the figure 2 and figure 3 given as below:

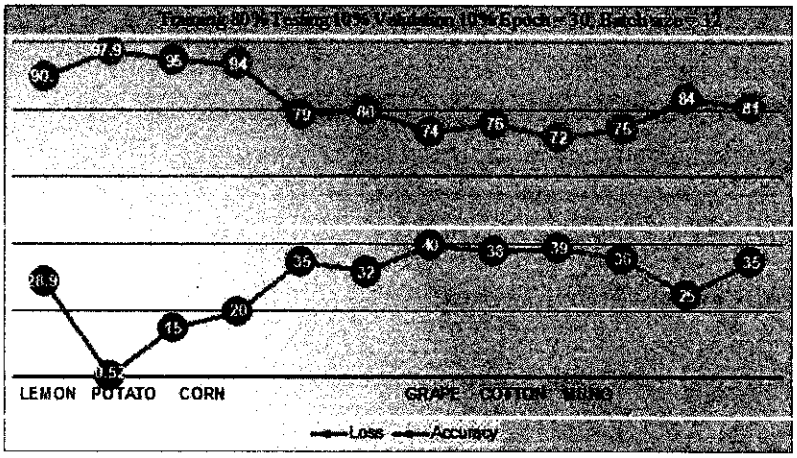

Fig 2: Accuracy and loss graph for the plants

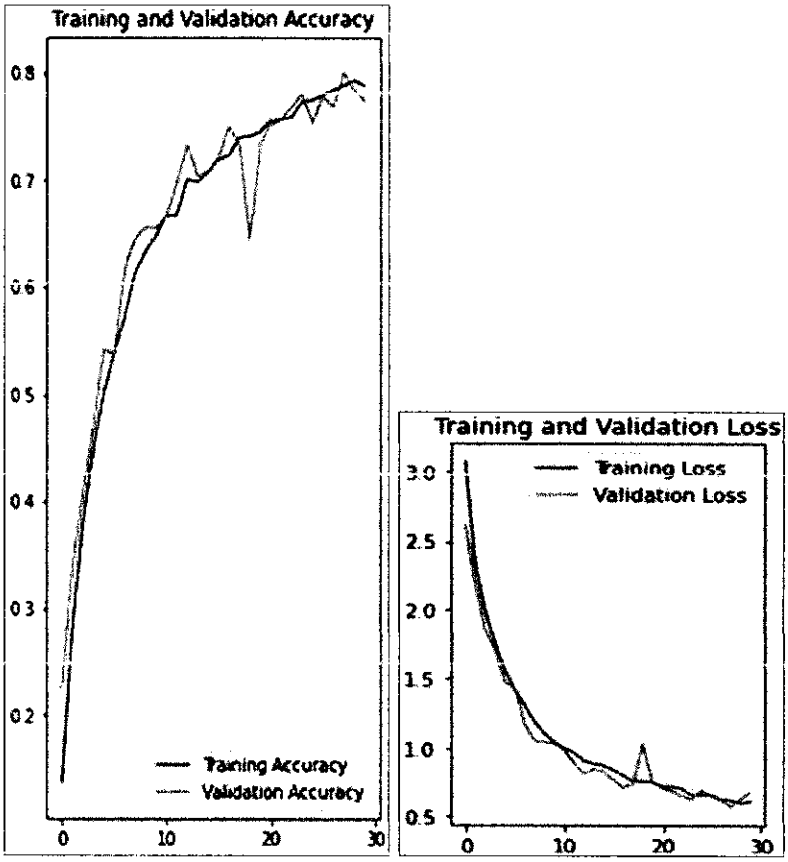

Fig 3: The graph plots validation, Accuracy and loss values

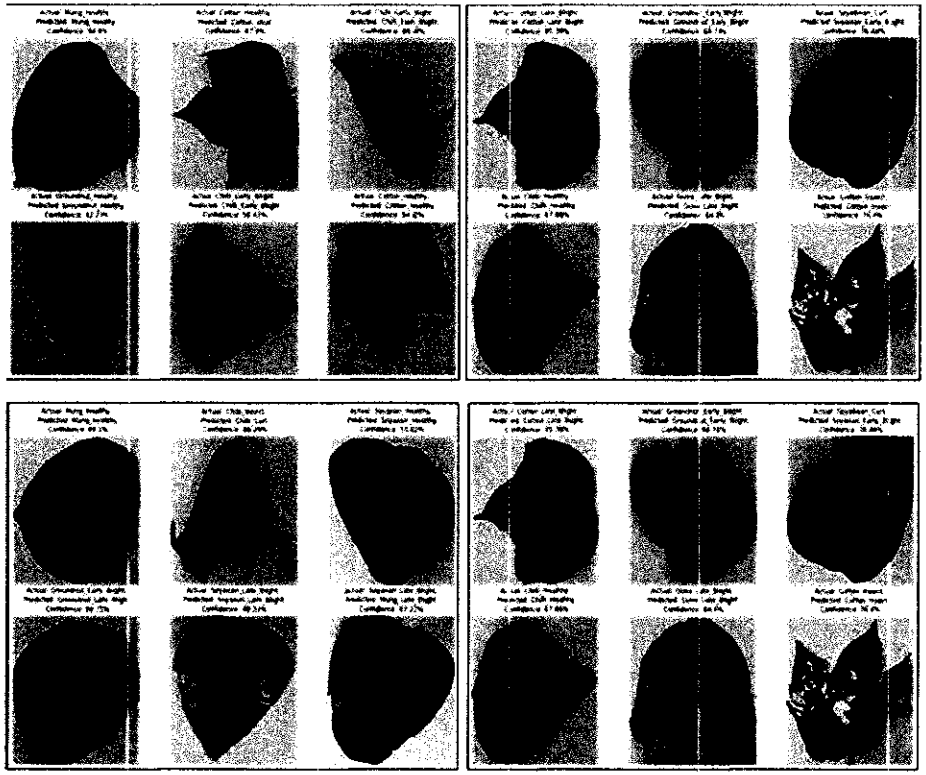

Fig 4: Confidence of the model on different leaf disease classes

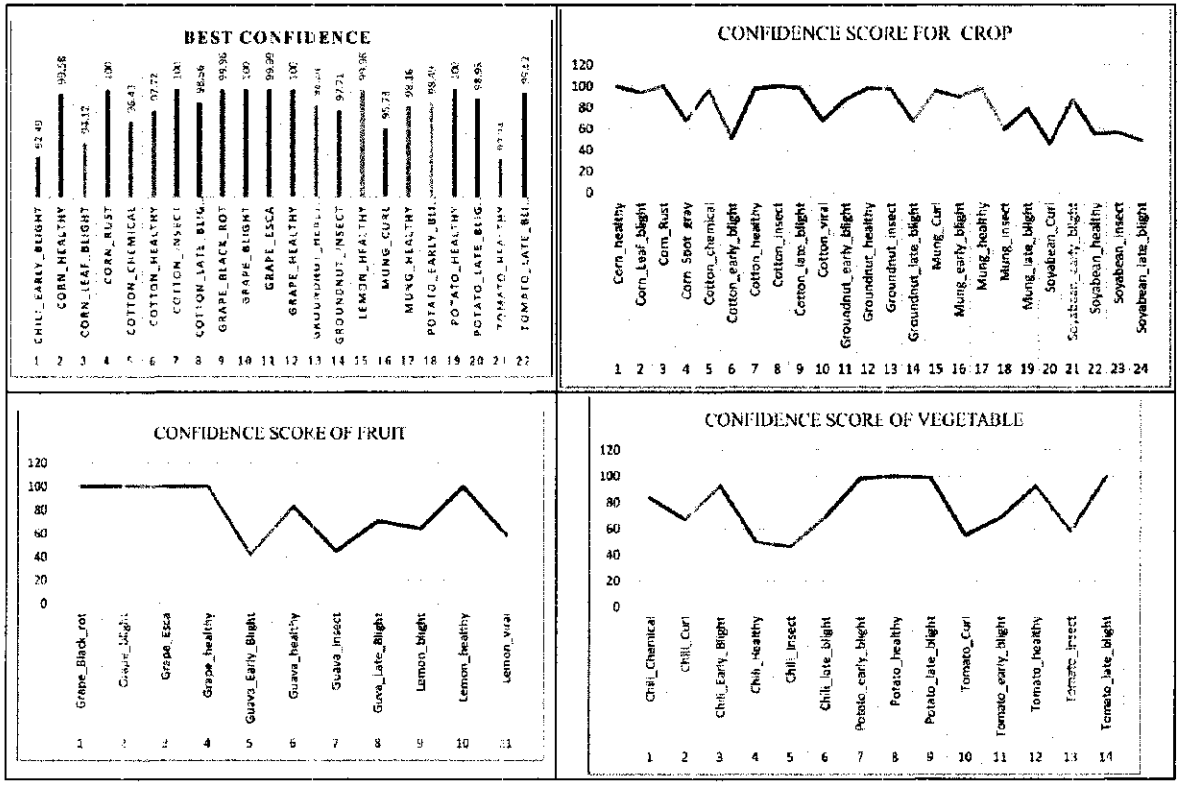

Fig 5: Confidence graph

AIML prediction system: The model developed by me while doing research is a digital agent with artificial intelligence. Developing the experience-based knowledge of agricultural scientists, agricultural supervisors, and farmers, understanding, was developed as a model. The name of this developed model is T-CNN (TYPICAL-CONVOLUTION NEURAL NETWORK). Which is currently capable of predicting the disease from the photos of leaves of tomato, chili, cotton, maize, soybean, groundnut, moong, guava, lemon, strawberry, etc. The T-CNN model can predict diseases for the crop with which it will be trained. Currently, there are many models available in the market but they are expensive and occupy more memory, whereas this T-CNN is the less memory-consuming model and this model can be operated on any platform. Whenever you need to train a model for a new plant, you can perform this task using Google-Colab. You can use this model by integrating it with any Android or iOS APP, as well as inform the farmers so that everyone can benefit from its forecasting technical system.

The architecture of the developed model: The development and structure of this model are divided into four parts. The first is the development of the model, the second is the training of the model, the third is the testing and validation of the model, and the fourth is the deployment of the model.

1) **Development of model:** T-CNN has a total of 15 layers of which six are CONV2D, six MAXPOOLING, one FLATTENED layer, and two DENSE layers. The first DENSE layer works with ReLu Activation Function and the second with SOFTMAX ACTIVATION FUNCTION. In this, the size of the kernel is 3 x 3 and the size of the filter is 2 x 2. The coloured image has been used in this model in 256 X 256 dimensions. EACH image COLOR has a total of 256 X 256 X3 = 196608 parameters but with this developed model 183747 parameter is providing 92% and above ACCURACY. There is no overfitting condition in the model. The prediction system of the model is balanced and reliable
2) **Model training:** In this phase, we made a dataset of 22,282 plant leaf images with the help of a mobile phone. Each image was taken in 1:1 resolution. Before training the images were classified according to plant and disease wise and stored in different folders. Through image pre-processing, the noise and other unnecessary elements of the image are removed and stored, this process is known as image cleaning or filtering or segmentation. Image augmentation allows the dataset to be magnified using rotation and

flipping techniques. So that the model can get enough images for training and the model can provide the best accuracy.

3) **Testing and validation of the model:** In this phase, the epoch, batch size, and dataset size of the model are observed by decreasing/increasing the MODEL. In this process TRAINING LOSS, ACCURACY, and Validation loss are monitored. By setting the criteria in which the model gives the best result, the training process of the model is fixed. In this model batch size is 32, the epoch value is 30, the training dataset is 80%, the testing dataset is 10% and the validation dataset is 10%. The model is giving the best results in this criterion, so the model has been trained according to the above criteria. Image quality is helpful in the accuracy of the model.

4) **Deployment of model:** After measuring the confidence of the model, save the model with the .h5 extension. Now all the necessary functions are integrated as a model and it is ready to use. When this model will be integrated with a user interface as an application or app. This app can be available on the Android/iOS platform or the web application can be available on the cloud. Farmers just have to open the app and upload the diseased leaf image or navigate the website, then the rest of the work is done by the model. The result of the model can be converted to a regional language or a voice message instead of plain English so that the productivity of the model can be improved.

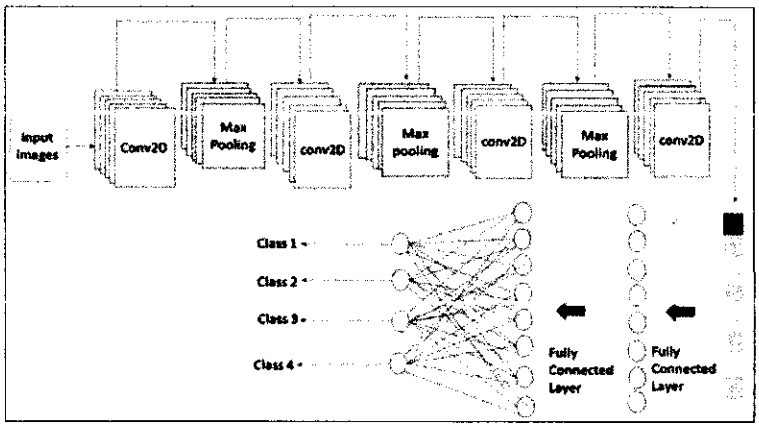

Fig 6: Architecture of T-CNN

Future prospectus: It is known that the forecast can be based not only on plant diseases but also on other factors. This model can be further improved by integrating moisture, pesticide, fertilizer prediction, and recommendation systems.

Conclusion: The purpose of research should not be limited to only a concept or idea, but to make it useful in agriculture, so this article is a stop in this direction. It should also prove useful for the learner, it should be extended further and it should increase the quality and yield of crops, this is the goal of my research.

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I'm on cloud nine right now as I write in gratitude to everyone who helped me start and finish my chapter on time. Although this voyage was difficult, it was made possible with the aid and direction of some kind people who helped to make my experience enjoyable. Without the encouragement and advice, I received from numerous people, I would not have been able to complete this chapter, which has been a truly life-changing experience for me. My supervisor at Sangam University, **Dr. Vikas Somani Associate Professor of CSE and Dr. Gunmala Guglia** Associate Professor of Botany, deserve my deepest gratitude. They were a continual source of encouragement, counsel, and direction for me as I wrote the chapter.

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CONTRIBUTED PAPERS

Possibilities of Employment Through Information Communication Technology in India

Dr. Sankarsan Panda
Mr. Avanindra Vasuki Vyas
Principal and Associate Prof(CS), Acharya Shri Mahapragya Institute of Excellence, AsindAcharya Shri Mahapragya Institute of Excellence, Asind
Assistant Prof(CS), pandasankarsanasind@gmail.com
avanindravasukivyas@gmail.com

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Abstract:

As we know unemployment is the biggest challenge in India. ICT has shown a positive angle on the creation of jobs in India's rural areas as well as in urban areas. The flagship program of Digital India, launched in 2015, aims at transforming India into a digitally empowered society and knowledge economy. The initiative includes several projects such as the National Optical Fibre Network, which aims at providing high-speed internet connectivity to all gram panchayats (village councils) in the country, and the Digital Locker, which provides a secure online space for storing valuable documents. Digital India has changed rural areas by creating lots of job opportunities. Now villagers can earn through YouTube, video editing, digital marketing, online teaching, digital learning, digital farming etc. Some entrepreneurs have started providing jobs to others by running e-mitras, kiosks, digital studios, data centers, courier services etc. Two digital universities have been established and some of may be established very soon by the UGC and state government. Such types of infrastructure would be very beneficial to develop the skill in the youngster and to open a wide path of employment for them. ICT has emerged in most of job sectors in India, since Covid-19. This paper aims to reveal the employment factors in rural areas of India through information communication technology.

Keywords:
ICT, Digital India, Digital Learning, NEP2020, Digital University and Digital Farming

Introduction: ICT stands for Information and Communication Technology. It refers to the use of digital technology for communication, information processing, and storage. ICT includes a wide range of technologies such as computers, smartphones, the internet, software, and other digital devices that facilitate the creation, processing, and sharing of information. ICT is used in various sectors such as education, healthcare, finance, and entertainment. It has transformed the way we live, work, and communicate with each other, enabling faster and more efficient information sharing and improving productivity in many fields.

India has been grappling with high levels of unemployment for many years, especially among the youth population. According to the latest data from the National Sample Survey Office (NSSO), the unemployment rate in India stood at 6.9% in 2019-20, the highest in the last four decades. The COVID-19 pandemic has further aggravated the unemployment situation in India, as many businesses had to shut down due to lockdowns and restrictions, resulting in widespread job losses. The unemployment rate in India soared to a record high of 23.5% in May 2020 but has since then gradually come down to around 7-8%. India is a country with a predominantly agrarian economy, with more than 65% of its population living in rural areas. Unfortunately, employment opportunities in these areas are often limited, leading to a significant migration of rural residents to urban areas in search of work. Information and Communication Technology (ICT) can play a critical role in creating employment

opportunities in rural areas, thereby stemming the migration of rural residents to urban areas. Overall, the possibilities for employment in Indian rural areas through ICT are immense. However, it will require the government and the private sector to work together to create the necessary infrastructure and provide training and support to the rural youth to take advantage of these opportunities. There are two digital universities are established and some of them would be established very soon. These types of infrastructure would be very helpful in up the skill of the youth and opening the door to new jobs through ICT. This research paper explores the potential of ICT to create employment opportunities in rural areas of India.

Survey of Employment in ICT

1. **In video editing and shooting**: According to data from the Indian job portal Naukri.com, there is a steady demand for video editing and shooting professionals in India. As of September 2021, the average salary for a Video Editor in India is around INR 3,50,000 per year, while the average salary for a Videographer is around INR 2,80,000 per year. Additionally, the film and television industry in India is one of the largest in the world, which creates a significant demand for video editing and shooting professionals. According to the Ministry of Information and Broadcasting, the Indian media and entertainment industry is expected to grow at a CAGR of 10.4% to reach INR 4.51 trillion by 2024. There are also many job opportunities in the advertising and digital marketing industries, where video editing and shooting are essential skills. As more and more companies move their advertising and marketing efforts online, the demand for video content is increasing rapidly.Overall, the demand for video editing and shooting professionals in India is expected to remain strong in the coming years, as more and more businesses turn to video

as a key communication tool.

2. **In online teaching**: Online teaching has become an increasingly popular profession in India, particularly in the wake of the COVID-19 pandemic, which has forced schools and universities to shift their classes online. According to data from the Indian job portal Naukri.com, there has been a steady increase in demand for online teaching professionals in recent years. As of September 2021, the average salary for an Online Tutor in India is around INR 4,00,000 per year, while the average salary for an Online Teacher is around INR 5,00,000 per year. These salaries can vary depending on factors such as experience, qualifications, and the level and subject matter being taught. There are also many job opportunities in the online education industry, with a wide variety of roles available, including content developers, curriculum designers, and online course coordinators. According to a report by KPMG, the online education market in India is expected to reach $1.96 billion by 2021, up from $247 million in 2016, indicating significant growth potential in this sector. Overall, the demand for online teaching professionals in India is expected to remain strong in the coming years, as online education becomes increasingly popular and more schools and universities incorporate online teaching into their curriculums.

3. **In E-Mitra and Kiosks**: E-Mitra and Kiosk services are government initiatives aimed at providing a range of citizen-centric services, such as bill payments, application forms, certificates, and more, through a network of digital kiosks across India. These kiosks are typically operated by private companies or individuals who have been authorized by the government to provide these services. According to data from the Rajasthan government's E-Mitra portal,

which is one of the largest such initiatives in India, over 1.5 crore transactions were conducted through E-Mitra centers in Rajasthan alone in 2020. This indicates a significant demand for these services, particularly in rural areas where access to digital services may be limited. As for employment opportunities in E-Mitra and Kiosks in India, these services require a range of skills, from basic computer literacy to customer service and administrative skills. According to the job portal Indeed, the average salary for a Customer Service Representative in India is around INR 2,40,000 per year, while the average salary for an Administrative Officer is around INR 3,60,000 per year.Overall, the demand for E-Mitra and Kiosk services in India is expected to remain strong in the coming years, as the government continues to expand these initiatives and bring more digital services to citizens across the country. This will likely create more employment opportunities for individuals with the necessary skills and qualifications to operate and manage these kiosks.

4. **In ICT Sector**: The Information and Communication Technology (ICT) sector is one of the fastest-growing industries in India, with a wide range of job opportunities available for professionals with the necessary skills and qualifications. According to a report by the India Brand Equity Foundation (IBEF), the Indian IT industry is expected to grow at a rate of 7.7% in FY22, and reach a size of USD 350 billion by 2025. Some of the most in-demand job roles in the ICT sector in India these are Software developer, Data scientist, Network engineer, Cybersecurity specialist and many more.Overall, the demand for skilled professionals in the ICT sector in India is expected to remain strong in the coming years, as more and more businesses and industries turn to technology to drive growth and innovation.

5. **In the educational video**: The educational video sector in India has seen significant growth in recent years, particularly in the wake of the COVID-19 pandemic, which has led to a surge in demand for online learning content. According to a report by KPMG, the online education market in India is expected to reach $1.96 billion by 2021, up from $247 million in 2016, indicating significant growth potential in this sector. As for employment opportunities in the educational video sector in India, there are a range of job roles available, including content creators, video editors, animators, graphic designers, and more. According to the job portal Naukri.com, the average salary for a Video Editor in India is around INR 4,00,000 per year, while the average salary for a Graphic Designer is around INR 3,00,000 per year. There are also many opportunities for freelancers and self-employed professionals in the educational video sector, particularly for those with specialized skills and experience. Freelance content creators and video producers can earn anywhere from INR 5000 to INR 50,000 per project, depending on the complexity and scope of the project.

Findings: Increasing employment through ICT in rural areas requires a multi-faceted approach that addresses the various challenges faced by rural communities. The following are some strategies that can be used to increase employment through ICT in rural areas:

1. **Digital Infrastructure**: The availability of digital infrastructure, including high-speed internet connectivity, is essential for the adoption of ICT in rural areas. Governments and private organizations have developed digital infrastructure in rural areas to facilitate the adoption of ICT and increase employment opportunities.

2. **Digital Literacy**: Digital literacy is crucial for the adoption of ICT in rural areas. Governments and private organizations are providing digital literacy training to rural residents to equip them with the skills they need to work in the digital economy.

3. **E-commerce Platforms**: E-commerce platforms can provide rural artisans and craftsmen with access to a larger market for their products. Governments and private organizations haveencouraged the use of e-commerce platforms by providing training and support to rural entrepreneurs.

4. **Telecommuting**: The use of ICT can facilitate telecommuting or working remotely for companies located in cities or other countries. Governments and private organizations have beenencouraging companies to establish IT-enabled service centers in rural areas, providing local residents with employment opportunities.

5. **Rural BPOs**: The establishment of Business Process Outsourcing (BPO) companies in rural areas can provide employment opportunities to people with basic computer skills. Governments and private organizations should encourage the establishment of rural BPOs by providing financial incentives and support.

6. **Agriculture and Farming**: The use of ICT can provide farmers with real-time weather and market information, leading to increased productivity and profitability. Governments and private organizations have beenmotivating the use of ICT in agriculture and farming by providing training and support to farmers.

7. **Entrepreneurship**: Governments and private organizations should encourage entrepreneurship in rural areas by providing

financial incentives, training, and support to rural entrepreneurs. This can include the establishment of incubation centers, business development centers, and startup funds.

8. **Mobile app development**: With the increase in smartphone usage in rural areas, there is a growing demand for mobile apps that cater to the needs of rural populations. ICT can create opportunities for rural residents to develop and market mobile apps that address the needs of their communities.

9. **Online education**: ICT can be used to provide online education and training to rural residents, enabling them to acquire new skills and competencies that can increase their employability.

10. **YouTube**: YouTube has emerged as a significant source of employment in India, providing opportunities for creators to monetize their skills and earn a livelihood. The platform's popularity and reach have created a level playing field for everyone, allowing them to showcase their talent and reach a global audience. With the increasing popularity of digital content, YouTube is expected to continue to create employment opportunities in India in the years to come.

11. **Digital University**: Through the digital university many young scholars would be benefitted and there will be new chances to create jobs for unemployed people.

Discussion: The NEP 2020 recognizes the importance of ICT in education and aims to leverage digital technologies to improve the quality of education in India. The policy proposes several initiatives to provide digital infrastructure, integrate ICT into the curriculum, and

train teachers in the use of digital technologies. These initiatives such as Digital Infrastructure,Integration of ICT in Curriculum,Blended Learning,Teacher Training and Digital Repositoriesare likely to transform the Indian education system and enhance the employability of students in the digital age.

YouTube has become one of the most popular platforms for creating and sharing video content across the globe, including India. With over 2 billion active monthly users, YouTube provides ample opportunities for content creators to monetize their skills and earn a livelihood. The platform has revolutionized the traditional entertainment industry by providing a level playing field for everyone to showcase their talent and reach a global audience. It has become a significant source of employment in India, with thousands of content creators earning a living through the platform. The platform offers a wide range of niches and topics to cater to the diverse interests of the audience, such as entertainment, education, cooking, travel, beauty, and technology. Indian content creators have leveraged this opportunity and created unique and engaging content that resonates with the local audience. Its monetization program allows content creators to earn revenue through advertising, sponsored content, merchandise sales, and fan funding. The platform's algorithm rewards creators who consistently produce high-quality content that keeps the audience engaged. The more views, likes, and shares a video receives, the more revenue the creator can earn. Its popularity has also led to the emergence of digital agencies and talent management companies in India. These agencies specialize in creating and promoting digital content and work with content creators to help them monetize their skills effectively. They provide services such as video production, audience engagement, and brand partnerships that help creators build

a sustainable career on the platform. it has also opened up new opportunities for traditional media professionals, such as actors, musicians, and filmmakers. Many Indian actors and musicians have launched their YouTube channels to showcase their talent and reach a broader audience. They use the platform to release their music videos, short films, and web series, which allows them to bypass traditional distribution channels and reach the audience directly.In addition to providing direct employment, YouTube has also created indirect job opportunities in India. The platform's popularity has created a demand for digital marketing professionals, video editors, and social media managers, who work with content creators and brands to create and promote content on the platform.

Video editing and shooting have emerged as lucrative professions in India, with the rise of digital media and entertainment. The demand for high-quality video content has created numerous job opportunities for video editors, cinematographers, and videographers, among others. It involves the process of selecting, arranging, and manipulating video footage to create a cohesive and visually appealing final product. Video editors use various software tools, such as Adobe Premiere Pro, Final Cut Pro, and DaVinci Resolve, to edit raw footage into a finished product. They work closely with directors, producers, and cinematographers to bring their vision to life.

In India, video editing has become a popular career choice, with numerous educational institutes offering courses in video editing and post-production. Many media and entertainment companies in India also employ video editors for their productions. With the growth of digital media, there has been a surge in demand for video editors in India, creating numerous job opportunities in this field.Similarly,

shooting or cinematography involves capturing video footage for various purposes, such as movies, TV shows, documentaries, music videos, and advertisements. Cinematographers use a range of equipment, such as cameras, lenses, lighting, and audio equipment, to capture high-quality video footage. They work closely with directors and producers to understand their creative vision and translate it into visually stunning footage.

In India, cinematography has been an essential aspect of the entertainment industry, with Bollywood producing some of the most visually stunning films in the world. Many media and entertainment companies in India employ cinematographers for their productions, creating numerous job opportunities for professionals in this field. Moreover, the rise of digital media has created a surge in demand for videographers who create video content for social media, YouTube, and other online platforms. These videographers often work as freelancers or start their own businesses, creating video content for a range of clients, such as brands, social media influencers, and small businesses. Data centers are becoming increasingly important as more and more businesses rely on technology to store and process their data. This has led to an increase in demand for skilled professionals in data centers, creating a range of job opportunities in this field.

The digitalization of education has opened up new job opportunities in the education sector. The use of digital content has created a need for skilled professionals who can create, manage, and deliver digital content that enhances the learning experience. With the increasing demand for e-learning and digital content, job opportunities in this field are expected to grow in the years to come.

Conclusion:In conclusion, this research paper suggests that ICT has

the potential to create employment opportunities in rural areas of India. By leveraging the power of technology, rural residents can access new markets, work remotely, and gain the skills they need to participate in the digital economy. However, there are still several challenges that need to be addressed, such as the lack of infrastructure and limited access to electricity and the internet in rural areas. Nevertheless, the potential benefits of ICT in creating employment opportunities in rural areas of India cannot be ignored, and efforts must be made to overcome these challenges and leverage the power of technology to promote rural entrepreneurship and development.

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Potential of Digital Learning in Light of National Education Policy-2020

Dr. Deepak Kumar Chaudhary, Ms. Amrita Anchliya
Associate Professor in Computer Science,
Acharya Shri Mahapragya Institute of Excellence, Asind,
dkcasind@gmail.com
Assistant Professor in ABST, Acharya Shri Mahapragya Institute of Excellence, Asind, jainamrita1234@gmail.com

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ABSTRACT:

The National Education Policy (NEP) 2020 in India acknowledges that digital learning has the potential to revolutionise education. The policy lays forth a broad vision for digital learning that takes advantage of digital tools, simulations, and gamification, as well as adaptive learning systems. The NEP 2020 highlights the value of expanding educational access through digital technology, especially in rural and isolated locations. The policy also emphasises the necessity of student digital knowledge and competency. This paper examines the potential and reach of digital learning in light of the NEP 2020, emphasising how the policy has the ability to change the educational landscape and enhance student results. The NEP recognizes the potential of ICT to transform education and proposes measures to promote its use in education. The integration of ICT in education has the potential to enhance teaching and learning, provide access to quality education, and improve the employability of students.

KEYWORDS:

Education, digital infrastructure, adaptive learning systems, gamification, simulations, interactive technologies, access to

education, rural locations, digital literacy, learning outcomes. Potential, scope, digital learning, NEP-2020, India.

INTRODUCTION:

The Indian government's National Education Policy (NEP) 2020 acknowledges the potential for digital learning to revolutionise the educational landscape. In the future, according to the NEP, digital technology will be employed to improve educational attainment and expand access to it. The strategy presents a thorough vision for the application of digital technologies in education, outlining gamification, adaptive learning systems, simulations, and other interactive tools in addition to the creation of digital infrastructure. The NEP also emphasises the significance of expanding educational access through digital technology, especially in rural and isolated places. The policy also emphasises the significance of student digital literacy and competency. This essay will examine the potential and reach of digital learning in light of the NEP 2020, emphasising its capacity to change the educational landscape and enhance student outcomes.

LITERATURE REVIEW:

The NEP 2020 and the literature on digital learning both emphasise a number of the major applications and potential of the technology. The ability of digital learning to increase access to education is one of its main benefits. Digital learning offers a way to get beyond these obstacles in India, where access to traditional educational facilities may be limited in remote and rural locations. Digital learning may enable children in remote and poor places have access to high-quality education, according to a study by Jain and Singh (2021).

The NEP 2020 acknowledges the potential of digital technologies to

raise educational standards. By offering each student a unique learning experience based on their skills and learning preferences, digital learning may help personalise learning. Learning may be made more interesting, interactive, and efficient by using gamification, simulations, and adaptive learning systems (Gupta, 2021).

The NEP 2020 places a strong emphasis on students' requirement for digital literacy and skills. In the modern world, where digital technologies are becoming more and more prevalent in daily life, having a working knowledge of the internet is crucial. The policy acknowledges the importance of giving pupils the digital skills they need to flourish in a world dominated by technology (Kumar & Tripathi, 2021).

The literature also emphasises how important digital infrastructure is for enabling digital learning. The NEP 2020 acknowledges the significance of creating digital infrastructure to enable online learning, which includes using digital libraries, online platforms, and e-learning resources (Mishra et al., 2021).

The body of research generally indicates that the NEP 2020's emphasis on digital learning is well-founded and has the potential to revolutionise the Indian educational system. Access to education can be increased through digital learning, which can also improve learning outcomes and give students the fundamental digital skills and competencies they need. However, substantial expenditures in digital infrastructure, instruction, and student and teacher support will be needed for the policy to be implemented successfully.

METHODOLOGY:

A literature analysis was done to examine the potential and reach of digital learning in light of the NEP 2020. A thorough search of

academic databases, including Google Scholar, ERIC, and JSTOR, turned up relevant articles and books. Digital learning, NEP 2020, India, education, digital infrastructure, adaptive learning systems, gamification, simulations, interactive technologies, access to education, distant locations, digital literacy, and learning outcomes were some of the keywords utilised in the search.

The articles and books chosen for examination were studied, and the NEP 2020's key possibilities and breadth of digital learning were identified. The literature evaluation concentrated on identifying the advantages of digital learning, such as its potential to increase learning outcomes, promote access to education, and give students vital digital skills and abilities. The evaluation also looked at the difficulties and restrictions that come with implementing digital learning in India, such as the requirement for sizable investments in digital infrastructure and teacher and student training. To guarantee that the findings are trustworthy and valid, the literature research was carried out in a methodical and exacting way.

Overall, the literature study offered insightful information about the potential and reach of digital learning in light of NEP 2020. The review's conclusions can guide the creation and application of digital learning techniques in India and other nations looking to use technology to increase educational access and improve learning results.

RESULT AND DISCUSSION:

The NEP 2020 acknowledges digital learning as a crucial method to raise educational standards and widen access to educational opportunities. The policy describes several opportunities and the reach of digital learning, which have the potential to revolutionise the

Indian educational system. The primary findings and discussions about the potential and reach of digital learning according to NEP 2020 are as follows:

1. Increasing access to education: In isolated and rural locations, digital learning can assist remove barriers to accessing education. The NEP 2020 acknowledges the need of utilising digital technologies to provide access to education and offers a framework for creating a digital infrastructure to facilitate online learning.

2. Improving learning outcomes: Digital learning may tailor learning experiences, giving each student a unique learning environment based on their learning preferences and aptitudes. Learning may be made more interesting, interactive, and efficient by using gamification, simulations, and adaptive learning systems.

3. Increasing digital literacy: The NEP 2020 places a strong emphasis on the need for pupils to increase their digital literacy and competency. In the modern world, where digital technologies are becoming more and more prevalent in daily life, having a working knowledge of the internet is crucial. The policy acknowledges the importance of giving pupils the digital skills they need to thrive in a world dominated by technology.

4. Fostering innovation: The education industry can foster innovation through digital learning. The NEP 2020 promotes the use of digital technologies to create novel teaching and learning strategies, including the use of augmented and virtual reality.

5. Improving teacher support and training: Digital learning can improve both. The NEP 2020 acknowledges the significance of giving

teachers the knowledge and abilities they need to use digital technology in their instruction successfully. However, the successful implementation of digital learning in India will require significant investments in the creation of a digital infrastructure and in teacher and student training. Although the NEP 2020 offers a framework for creating digital infrastructure and training programmes, ongoing efforts are required to successfully implement the policy.

In India, the digital divide continues to be a major problem, especially in rural and remote locations where access to digital infrastructure and equipment may be restricted. The NEP 2020 acknowledges this difficulty and urges action to close the digital gap and guarantee that all students can access digital learning opportunities.

CONCLUSION AND FUTURE SCOPE:

In conclusion, the NEP 2020 acknowledges the transformative potential of digital learning in the education sector and offers a thorough framework for utilising digital technologies to improve learning outcomes, increase access to education, and foster the development of critical digital skills and competencies. The strategy offers a road map for the creation of digital infrastructure, teacher preparation, and support; nonetheless, consistent efforts and financial commitments will be needed for the successful implementation of digital learning.

A number of suggestions are made for increasing digital learning in the NEP 2020, such as the creation of adaptive learning systems, gamification, and simulations, as well as the use of interactive technologies to tailor learning experiences. The necessity for students, instructors, and educational administrators to increase their digital

literacy and competencies is also emphasised in the policy. Further persistent efforts will be required to successfully implement the NEP 2020's recommendations. Investments in digital infrastructure, teacher assistance, and training are necessary for this. Moreover, efforts must be made to close the digital gap and guarantee that all children have access to digital learning opportunities. In order to find new methods for digital learning and boost the efficiency of current technology, research and innovation must continue. The development of evidence-based techniques for utilising digital technology to improve learning outcomes, particularly for underprivileged and disenfranchised students, should be the main emphasis of future research.

In brief, the NEP 2020, which offers a road map for advancing digital learning in India, can also serve as a model for other nations looking to use digital technologies to expand access to education and boost learning results. The successful adoption of digital learning in India would necessitate consistent work and financial commitments, but its transformative potential is substantial and its advantages may extend far.

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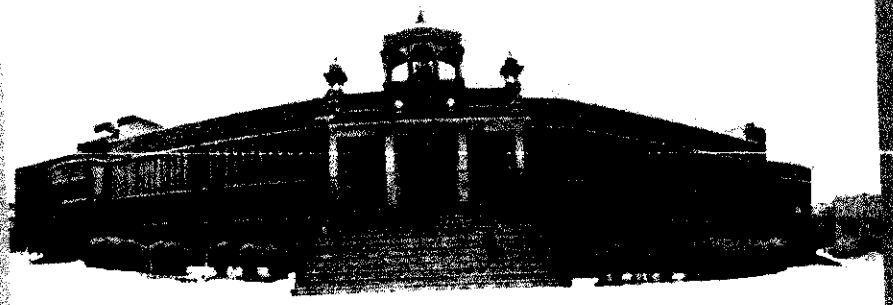

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Abstracts

Cyber Crimes: An Approach to Minimise the Damage of E-sim Frauds

Manish Tanwar
Associate Professor, Institute of Management Studies, S. B. J. S. Rampuria Jain College, Bikaner

Abstract

E-sim frauds are here to stay, what is needed to fight against them is a conscious effort to be alert in any kind of e-correspondence. This research paper is an outcome of literature review work that is being conducted by researcher, for the purpose of his research on growth of e-sim frauds in India; and government and handset operator's efforts to minimise and control, the related, identity theft, banking and other related frauds. The research paper discusses security related concerns to the e-sim frauds being conducted in India since 2020. The research will cover topics like introduction to e-sim, converting physical sim to e-sim, how the con-man are conning e-sim subscribers, precautions that can be taken while switching and transferring e-sim, and government advisories and initiatives to protect against e-sim frauds. Objective of this research is to gather data and generate information and awareness related to e-sim frauds and protection against them. Research methodology being adopted for the research is that of qualitative research. Secondary data has been used for the purpose of research, which has been gathered from news and other related information published in newspapers and magazines. Implications of this research will be that, the society would be more aware to safeguard itself against the new methods of identity theft, banking and other related frauds being devised by the fraudsters.

Keywords: e-SIM, e-SIM Frauds, cyber-crime, mobile operators, mobile hand-sets.

Measures of Digital Transactions and Cyber Challenges in India

Dr. Sankarsan Panda
Principal & Associate Professor (CS), Acharya Shri Mahapragya Institute of Excellence, Asind

Abstract

The growth of digital transactions in India has been substantial in recent years with an increase in the use of digital payment methods such as UPI, mobile wallets, and online banking. However, this growth has also exposed the country to cyber threats and challenges. These are Data breaches and privacy violations, financial frauds such as phishing and skimming, Cyber-attacks on payment Systems and infrastructure and Lack of awareness and technical expertise to detect and prevent cyber threats. To address these challenges, the paper suggests various measures such as setting up cybercrime cells, mandatory reporting of data breaches and strengthening the cybersecurity infrastructure. The government is also promoting the adoption of secure digital transactions through initiatives like Digital India and Digital Payment Security Alliance.

***Keywords**: Financial fraud, Cyber-Security, UPI, Digital India and Security Measures.*

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The Cashless Economy in India: Opportunities and Challenges

Deepak Kumar Chaudhary
Research Scholar, Sangam University Bhilwara

Abstract

In recent years, the Indian economy has seen a rapid transformation with the advent of digital technologies and the rise of a cashless economy. The shift towards a cashless economy has been driven by several factors, including increased financial inclusion, greater efficiency and convenience, and the need for a more secure and transparent payment system. While this transition presents numerous opportunities, it also poses several challenges that need to be addressed. The cashless economy also provides greater efficiency, as it eliminates the need for physical currency, reducing the cost and time involved in transactions. Additionally, it provides greater convenience for consumers, as they can now make payments from anywhere at any time.

However, there are also several challenges posed by the cashless economy, such as the need for infrastructure development, increased security risks, and the potential for job loss due to increased automation. There is also a risk of a digital divide, as a large portion of the population may not have access to digital technologies and the skills needed to participate in the cashless economy.To ensure the successful implementation of the cashless economy in India, it is important to address these challenges. This will require investment in infrastructure development and digital literacy programs, as well as measures to ensure the security of digital transactions.

In conclusion, the cashless economy presents both opportunities and challenges for India. While it provides numerous benefits, such as increased financial inclusion and greater efficiency, it also poses several challenges that need to be addressed to ensure its successful implementation. The government must play a key role in promoting the transition to a cashless economy, while also addressing the challenges posed by this transition.

Keywords: Cashless economy, Digital technologies, Financial inclusion, Digital literacy and Automation.

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ए.आई.एम.एल. एकीकृत प्रणाली से कृषि - एक अंतर्विषयक शोध

डॉ. संकर्षण पंडा

एसोसिएट प्रोफेसर डिपार्टमेंट ऑफ़ कंप्यूटर साइंस

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Dr. Sankarsan Panda

Principal & Associate Professor (CS)

Acharya Shri Mahapragya Institute of Excellence,

Mahapragya Nagar, Asind, Bhilwara (Rajasthan) 311301 India

Mobile 9829625844 E Mail: pandasankarsanasind@gmail.com

संक्षेप:-

कृषि की परम्परागत तकनीक में पीढ़ी दर पीढ़ी उन्नति होती रही है। कृषि में विज्ञान के समावेश से हरित क्रांति द्वारा हम खाद्यान्न के मामले में आत्मनिर्भर हुए है । लेकिन एक दशक से ए.आई.एम.एल. ने हमारी सोच एवं कृषि प्रणाली को अत्यंत प्रभावित किया है। साथ ही कृषि जगत में आशातीत बदलाव भी हुए हैं। कुछ वर्षों से ए.आई.एम.एल. तकनीक पर आधारित खेती करने की प्रक्रिया विश्वभर में शुरु हो चुकी है लेकिन भारत जैसे विकासशील देश में अभी भी कृषि क्षेत्र में इस तकनीक के प्रयोग की स्थिति संतोषप्रद नहीं है। विकसित मोडल का नाम है "T-CNN" अर्थात् "Typical Convolution Natural Network" यह वर्तमान में टमाटर, मिर्ची, कपास, मक्का, सोयाबीन, मूंगफल, मूंग, अमरूद, नींबू एवं स्ट्रास्ट्रॉबेरी आदि की पत्तियों के फोटो से रोगों का 92 प्रतिशत एक्यूरेसी के साथ पूर्वानुमान लगाने में समर्थ है ।

कूट शब्द:- एआईएमल, टीसीएनएन, सीएनएन, न्यूरल नेटवर्क, पत्तियों के रोग।

प्रस्तावना:-

कृषि मानव जीवन का एक अभिन्न अंग है। मानव सभ्यता के विकास के साथ-साथ कृषि के स्वरूप में परिवर्तन और नवाचार होते रहे हैं एवं भविष्य में भी ये निरंतर रूप से होते रहेंगे । हालांकि जनसंख्या की दृष्टि से हम प्रथम या द्वितीय स्थान पर हैं फिर भी ए.आई.एम.एल. आधारित कृषि प्रणाली से हम अभी भी अनभिज्ञ हैं। ए.आई.एम.एल. तकनीक से कृषि करके हम कई समस्याओं का मोबाइल फोन एवं इन्टरनेट की सहायता से समाधान कर सकते हैं साथ ही कृषि में फसलों की गुणवत्ता एवं पैदावार को बढ़ा सकते हैं । संगम विश्वविद्यालय के विषय विशेषज्ञों के मार्ग निर्देशन में मैंने अपना शोध कार्य वर्ष 2019 में प्रारम्भ किया। शोध कार्य के दौरान ए.आई.एम.एल. तकनीक से विभिन्न प्रकार के पौधों की पत्तियों की फोटो से पौधों के रोगों का पूर्वानुमान लगाना था । मैं आप सभी को इस आलेख के माध्यम

से ए.आई.एम.एल. तकनीक आधारित कृषि की ओर ध्यान आकर्षित करना चाहता हूँ ।इस शोध को समझने के लिए सर्वप्रथम हमें यह जानना है कि कृषि में इस तकनीक की आवश्यकता क्यों है ?

1 भारत में आज भी कृषक परम्परागत तरीकों से कृषि करते हैं जिससे फसलों का यथेष्ट उत्पादन प्राप्त नहीं कर पाते हैं और परिणाम स्वरूप अधिक लाभ से वंचित रह जाते हैं।
2 कृषि पर्यवेक्षक, कृषि सहायकों और सरकारी संसाधनों की न्यून उपलब्धता के कारण भी उनके पर्याप्त लाभ में कमी रहती है।
3 मिट्टी, पानी, मौसम, फसल, कीटनाशक, उर्वरक एवं उनकी यथेष्ट मात्रा सम्बधी पर्याप्त ज्ञान का अभाव भी उनके कृषि कार्य में बाधक बनता है।

उपरोक्त तीनों बिंदुओं के अलावा भी कई अन्य कारण हो सकते हैं । असीम प्रयासों के उपरान्त भी परम्परागत कृषि प्रणाली से इन समस्याओं का हल कठिन है । जिन देशों की अर्थव्यवस्था कृषि पर निर्भर नहीं है, वे सब ए.आई.एम.एल. तकनीक को अपना कर कृषि उत्पादन में नये आयाम स्थापित कर रहे हैं। समय, काल और परिस्थिति के अनुसार परिवर्तन कर लेने का सभी विद्वानों ने समर्थन किया है। आइये हम ए.आई.एम.एल. तकनीक आधारित कृषि को समझने का प्रयास करते हैं।

ए.आई.एम.एल.:-

यह प्राकृतिक बुद्धि के विपरीत है एवं यह मशीन द्वारा प्रदर्शित बुद्धि है। ए.आई.एम.एल. से हम एक होंशियार एजेंट का निर्माण करके उसे किसी आवश्यक कंपोनेंट में एकीकृत कर देते हैं ताकि वह वातावरण को समझ कर पूर्वानुमान करे जो कि हम सभी के लिए उपयोगी हो। ए.आई.एम.एल. तकनीक का प्रयोग खेती में भी हो सकता है । यह तकनीक किसानों को अवगत करायेगी कि,

- बीज कब बोना है,
- सिंचाई कब और कितनी करनी है,
- मिट्टी की उर्वरता की सटीक जानकारी से किसान को कब अवगत कराना है,
- पौधों पर तापमान के नियंत्रण हेतु क्या उपाय करना है,
- कीटनाशकों का उपयोग कब, कितना और कैसे करना हैऐसी समस्त समस्याओं को ए.आई.एम.एल. तकनीक द्वारा आसानी से हल कर सकते हैं ।

ए.आई.एम.एल. आधारित पूर्वानुमान प्रणाली:-

शोध कार्य अवधि के दौरान मेरे द्वारा जिस मोडल को विकसित किया गया वह एक कृत्रिम बुद्धि युक्त डिजीटल एजेन्ट है। जिसे कृषि वैज्ञानिक, कृषि पर्यवेक्षक एवं किसानों के अनुभव आधारित ज्ञान को अर्थात् समझ को एक मोडल के रुप में विकसित किया गया । इस विकसित मोडल का नाम है "T-CNN" अर्थात् "Typical Convolution Natural Network" यह टमाटर, मिर्ची, कपास, मक्का सोयाबीन, मूंगफल, मूंग, अमरूद, नींबू एवं स्ट्रास्ट्रॉबेरी आदि की पत्तियों के फोटो से रोग का पूर्वानुमान लगाने में समर्थ है । T-CNN मोडल को जिस फसल के साथ प्रशिक्षित किया जाता है यह उसके रोगों का पूर्वानुमान लगा सकता है। वर्तमान में बाजार में कई मोडल उपलब्ध हैं लेकिन वे खर्चीले एवं अधिक

मैमौरी घेरने वाले हैं, जबकि T-CNN मोडल कम मैमौरी लेने वाला मोडल है एवं इस मोडल को किसी भी प्लेटफार्म पर संचालित किया जा सकता है। जब कभी किसी नवीन पौधे के लिए मोडल को प्रशिक्षित करना हो तब Google Colabका प्रयोग करके इस कार्य को संपादित किया जा सकता है। इस मोडल को किसी भी Android या iOS के App से integrate करके उपयोग में लिया जा सकता है। साथ ही किसानों को भी कृषि सम्बधी करणीय प्रयासों के सम्बन्ध में यथा समय अवगत कराया जा सकता है ताकि इसकी पूर्वानुमान तकनीकी प्रणाली से वे सभी लाभान्वित हो सकें ।

विकसित मोडल की संरचना:-

इस मोडल के विकास एवं संरचना को चार भागों में विभक्त किया गया है।

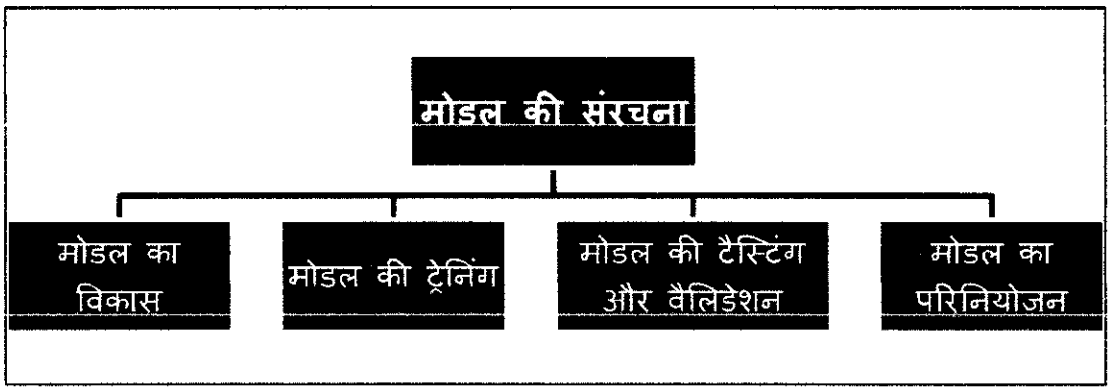

Figure 1: shows the development steps of the model

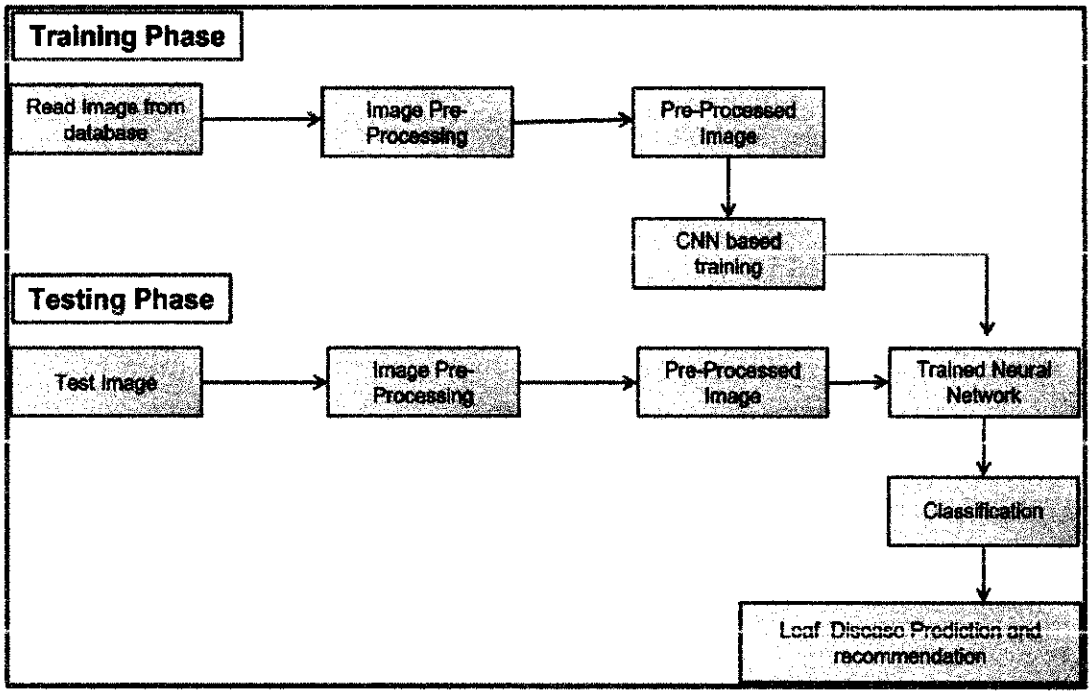

Figure 2: Describes the workflow of the model

1. **मोडल का विकास:-** T-CNN में कुल 15 लेयर्स हैं जिनमें छः Conv2Dके, छः मैक्स पूलिंग, एक फ्लैटंड एवं दो डेन्स लेयर्स है। पहली डेन्स लेयररेलु एक्टिवेशन फंक्शन के साथ एवं दूसरी सॉफ्टमैक्स

फंक्शन के साथ कार्य करती है A इसमें कर्नल की साइज3 x 3 एवं फिल्टर की साइज 2 x 2 हैS A इस मोडल में कलर इमेज का प्रयोग किया गया है जिसके आयामों का मान 256 x 256 है A कलर इमेज के कारण इमेज में कुल 256x256x3=196608 पैरामीटर हैं लेकिन यह विकसित मोडल 183747 पैरामीटर के साथ 92%से अधिकaccuracy प्रदान कर रहा है। मोडल में किसी प्रकार की ओवरफिटिंग की स्थिति नहीं है। इसकी पूर्वानुमान प्रणाली सन्तुलित एवं विश्वसनीय है।

2. **मोडल की ट्रेनिंग:-** इस फेज में हमने 22282 पौधों की पत्तियो के इमेज को मोबाइल फोन की सहायता से डेटासेट बनाया। प्रत्येक इमेज को 1:1 resolution में लिया गया। ट्रेनिंग से पूर्व इमेजेस को पौधों के अनुसार एवं रोगों के अनुसार वर्गीकृत कर अलग-अलग फोल्डर में स्टोर किया गया । इमेज प्री-प्रोसेसिंग के द्वारा इमेज के नॉइज़ एवं अन्य अनावश्यक तत्वों को हटा कर स्टोर कर दिया। इस प्रक्रिया को इमेज क्लीनिंग या फिल्टरेशन या सेगमेंटेशन के नाम से जाना जाता है। इमेज अगमेंटेशन से डेटासेट को रोटेशन एवं फ्लीपिंग तकनीक से बढ़ाया जाता है। जिससे कि मोडल को ट्रेनिंग के लिए पर्याप्त इमेज मिल सके ताकि मोडल अधिकतम एक्यूरेसी उपलब्ध करा सके ।
3. **मोडल की टैस्टिंग एवं वैलिडेशन:-** इस फेज में मोडल के एपोक,बैच साइज एवं डेटासेट की साइज को घटाबढ़ा कर रिजल्ट को ऑब्ज़र्व किया जाता है। इस प्रक्रिया में टे्निंग लॉस,एक्यूरेसी एवं वैलिडेसन लॉस को मॉनिटर किया जाता है। जिस क्राइटेरिया में मोडल बेहतरीन रिजल्ट दे उसी क्राइटेरिया को सेट करके,मोडल की टे्निंग प्रक्रिया को फिक्स कर दिया जाता है। इस मोडल में बैच साइज 32 है,एपोक का मान 30 है,टे्निंग डेटासेट 80% है ,टैस्टिंग डेटासेट 10% है एवं वैलिडेसन डेटासेट 10% है। इस क्राइटेरिया में मोडल श्रेष्ठ परिणाम दे रहा है इसलिए मोडल को उपरोक्त क्राइटेरिया अनुसार प्रशिक्षित किया गया है। इमेज की क्वालिटी मोडल की एक्यूरेसी में सहायक है।
4. **मोडल का परिनियोजन:-** मोडल के कॉन्फिडेंस को मेजर करने के बाद मोडल को.h5एक्सटेन्शन से सेव कर देते हैं। आवश्यकतानुसार इस मोडल को एप्लिकेशन के द्वारा एंड्राइड/आई ओ एस प्लेटफार्म पर उपलब्ध करवा कर इसे किसानों के लिए उपयोगी बनाया जा सकता है। किसानों को केवल ऐप्प को ओपन करके पत्तियों की इमेज को अपलोड करना है और शेष कार्य मोडल करता है। मोडल रिजल्ट को क्षेत्रीय भाषा में बदलकर या वौइस् मेसेज के रूप में प्रर्दशित किया जा सकता है ताकि मोडल की उपादेयता बढ़ायी जा सके।

TRAINING AND TESTING CRITERIA				Training80% Testing 10% Validation 10% Epoch 30 Batch size 32		Training 80% Testing10% Validation10% Epoch15 Batch size 32		Training70% Testing15% Validation15% Epoch 15 Batch size 32	
Sr No	**Dataset**	**Class**	**Total Image**	**Loss**	**Acc**	**Loss**	**Acc**	**Loss**	**Acc**
1	Lemon	3	1892	28.9	90.1	37.9	83.1	32.93	87.1
2	Potato	3	1721	0.52	97.92	15	86	6	94.92
3	Corn	4	3080	15	95	24	88	19	92

4	Grape	4	4062	20	94	29	87	24	91
5	Cotton	6	2024	35	79	44	72	39	76
6	Mung	5	2043	32	80	41	73	36	77
7	Guava	4	1076	40	74	49	67	44	71
8	Soybean	5	1678	38	76	47	69	42	73
9	Mungphali	4	1262	39	72	48	65	43	69
10	Chili	6	1564	36	75	45	68	40	72
11	Tomato	5	1880	25	84	34	77	29	81
12	ALL	49	22282	35	81	44	74	39	74

Table 1: specifies the training criteria of the model

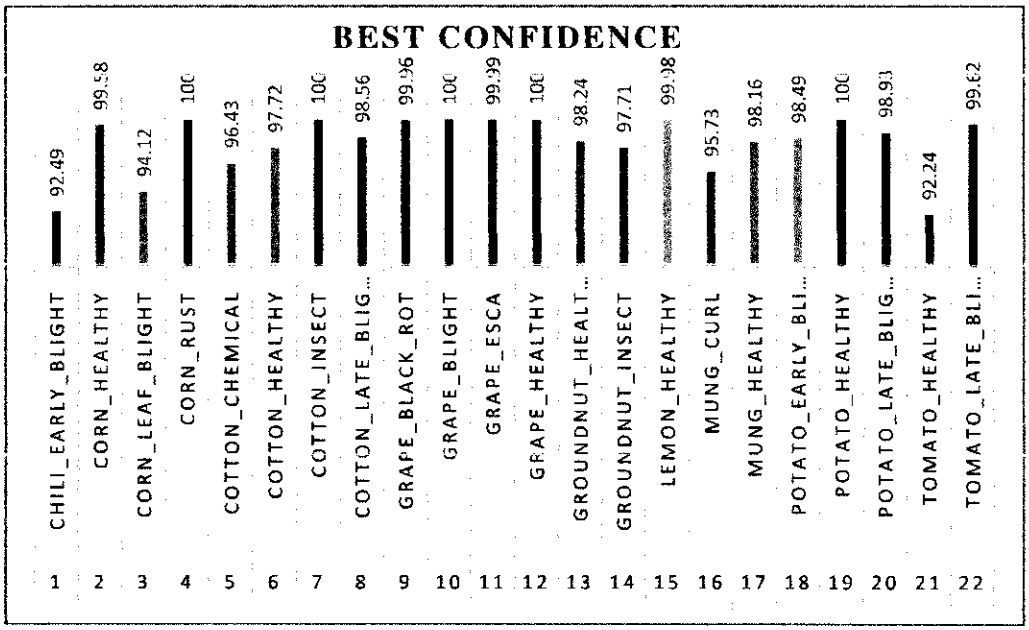

Figure 3: shows confidence score of T-CNN

भविष्य की योजना:-

विदित है कि पूर्वानुमान केवल पौधों के रोगों का नहीं होकर अन्य फेक्टर पर भी आधारित हो सकता है । इस मोडल में नमी,कीटनाशक,उर्वरक का पूर्वानुमान एवं रिकमेन्डेशन सिस्टम को इन्टीग्रटेड करके और भी उत्कृष्ट बनाया जा सकता है।

उपसंहार:-

शोध का उद्देश्य केवल कान्सेप्ट या आइडिया तक सीमित होकर रहना नहीं है। बल्कि कृषि उपयोगी बने इसलिए यह आलेख इस दिशा में एक पड़ाव है। T-CNNमोडल किसानों के साथ-साथ ए.आई.एम.एल. लर्नर के लिए भी उपयोगी सिद्ध हो, इसका और भी विस्तार हो तथा फसलों की गुणवत्ता एवं पैदावार को बढ़ाने वाला हो यही मेरे शोध का उद्देश्य है । मेरी शोध का परिणाम टीसीएनएन मोडल है जो कि92 प्रतिशत एक्यूरेसी के साथ पत्तियों के रोगों का पूर्वानुमान लगाती है।

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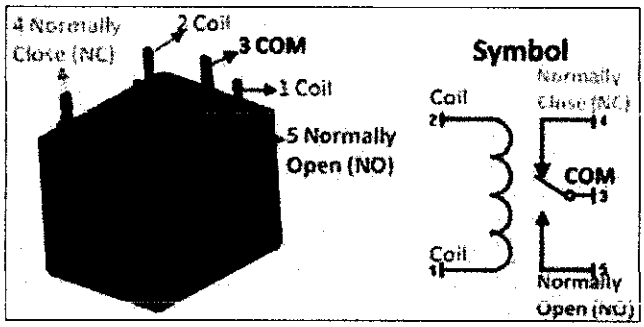
devices that need it. These jumpers connect sticks 6 and 20 as well as pins 4, 5, and 8. The introduction of the IBM PC AT has created a brand-new wrinkle in RS232 correspondences.



Source: netashop.gr

Fig 5: Circuit diagram of relay

Conclusion

The self-maintained aquarium system built on a microcontroller and equipped with sensors makes use of a number of innovations in terms of design, development, and operation. The system used a microprocessor to monitor the operation of a fish tank in an overhead tank storage system. It can also determine the amount of water in a tank, turn the tank on or off using sensors as needed, and display the status on an LCD screen. This tactic has successfully improved the performance of the current water level controllers.

Future prospects

The goal of developing a computerized fish sustaining system is to

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