

## **AGRITECH**

- 1. HI/BI State:** Andhra Pradesh
- 2. HI/BI Centre:** Lakireddy Bali Reddy College of Engineering
- 3. Idea Theme:** Agriculture
- 4. Title of proposed Idea/Innovation:**

"Crop Price Forecast: Machine Learning-Based Prediction of Crop Prices for  
Agricultural Markets"

**5. Briefly explain the newness/uniqueness of the Innovation:**

Everyone has a smartphone these days, but they aren't all using them to their full potential. They therefore don't need to take any additional actions; they just upload their product and get the information they need. Therefore, utilizing this form of technology (cv), any farmer can use it and sell their products for fair prices without incurring debt or suffering financial losses.

**SPECIALTY OF OUR APPROACH:**

1. The Computer Vision (cv) tool is very trustworthy.
2. It is really accurate.
3. There is no risk of product damage while utilizing cv.
4. It is reachable for all kinds of crops.

**6. Specify the potential areas of application in Industry/Market in brief:**

- ❖ **Agricultural Commodities Trading:** ML-based crop price prediction models can assist traders and investors in making informed decisions regarding the buying and selling of agricultural commodities. Accurate price forecasts can enable traders to identify profitable opportunities, manage risks, and optimize trading strategies.
- ❖ **Farmer Decision Support:** ML-based crop price prediction can provide valuable insights to farmers, helping them make informed decisions regarding crop selection, planting schedules, and marketing strategies. By considering price forecasts, farmers can align their production with market demands, optimize resource allocation, and maximize their profitability.
- ❖ **Risk Management:** Crop price prediction models can aid in risk management for various stakeholders in the agricultural sector, including farmers, input suppliers, and financial institutions. By understanding future price movements, stakeholders can implement risk mitigation strategies, such as hedging or insurance, to protect against potential losses.
- ❖ **Market Research and Analysis:** ML-based crop price prediction models can support market research and analysis in the agriculture industry. By analyzing historical price data and incorporating market indicators, these models can generate valuable insights and trends for market research firms, analysts, and consultants.

### 7. Briefly provide the market potential of Idea/Innovation:

The market potential for crop price prediction using ML is substantial and growing rapidly. ML models offer accurate and timely insights into crop price trends, enabling stakeholders to make informed decisions and mitigate risks. With the increasing demand for agricultural commodities, traders can optimize their trading strategies and maximize profitability. Farmers can align their production with market demands, improving resource allocation and overall profitability. Overall, the adoption of ML-based crop price prediction has the potential to revolutionize decision-making processes in the agricultural industry.

### 8. Project summary (Maximum 500 words):

The proposed project aims to develop an application that utilizes image processing and neural networks to detect crop price in agriculture. The application requires users to provide image of the crop which will be analyzed to identify with some more parameters from user to get the crop selling price in the market.

Mainly, our approach is to benefit the farmers in the financial way. They should know the actual price of the crop in the market.

Process:

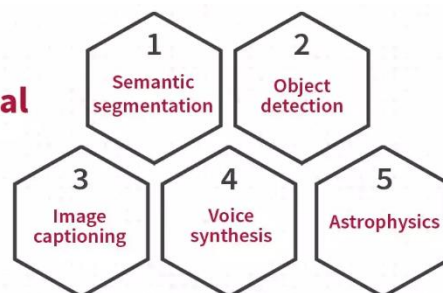
1. Farmers have to capture the image of crop.
2. To upload the image the farmers have to click on the upload button given in the Application.
3. Select the required image and upload.
4. By giving the information needed regarding the climate , temp, month it will predict the cost of the crop.

### Methodology:

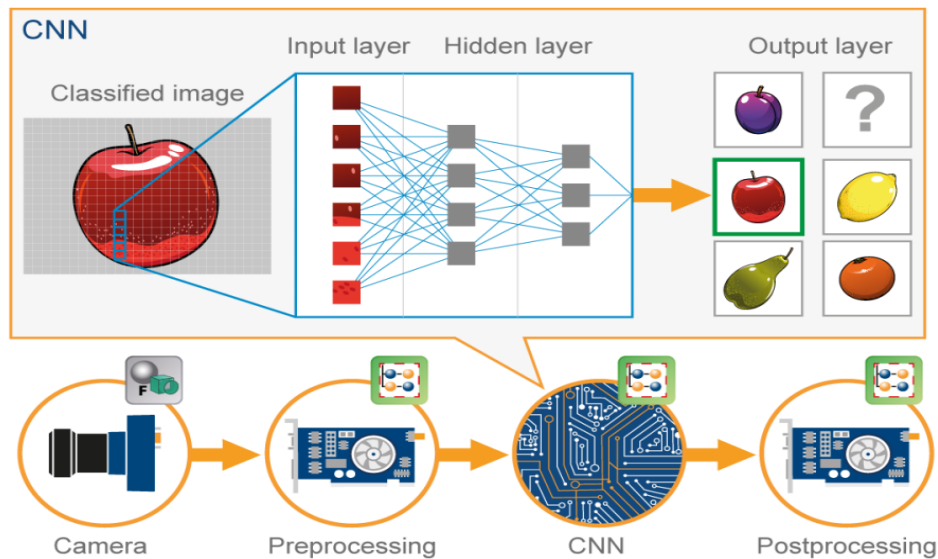
This project is mainly based on the Machine learning and Deep learning algorithms.

- ❖ To scan the required crop we use image processing(CNN) which is subset of the computer vision(cv). Convolutional Neural Networks are deep learning models designed specifically for processing & analyzing visual data such as images & videos.

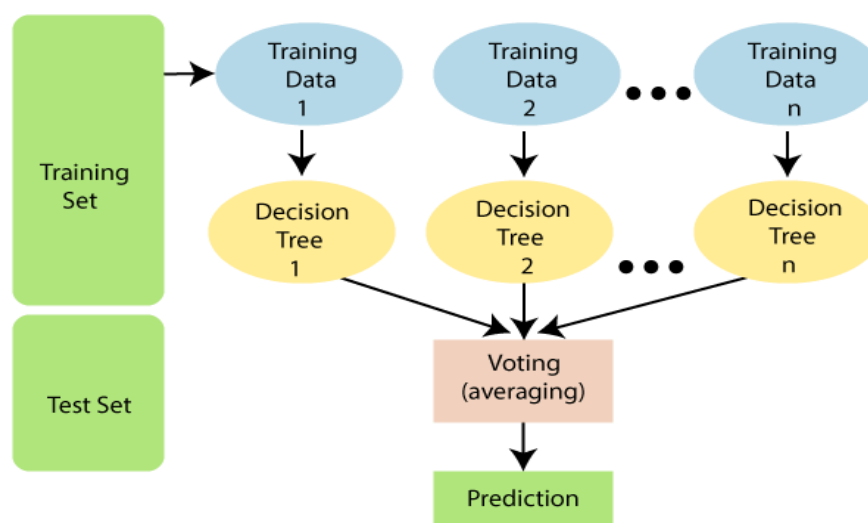
### Uses of Convolutional Neural Network



**Object detection:** CNN can detect objects within an image, for e.g:- identifying the location & the type of vehicle on the road  
we are using the object detection to detect the name of the crop.



❖ In order to detect the price of the crop we apply the Random Forest algorithm. Random Forest is based on the concept of ensemble learning, which is a process of combining multiple classifiers to solve a complex problem and to improve the performance of the model. As the name suggests, **"Random Forest is a classifier that contains a number of decision trees on various subsets of the given dataset and takes the average to improve the predictive accuracy of that dataset."**



Why use Random Forest?

- It takes less training time as compared to other algorithms.
- It predicts output with high accuracy, even for the large dataset it runs efficiently.
- It can also maintain accuracy when a large proportion of data is missing.

#### **9. Origin of the proposal:**

In India , agriculture sector is a primary source for about 58% of population . But it is quite common that most of the farmers in rural areas are non-tech people . Presence of Too Many Intermediates/Middlemen results in the exploitation of both farmers and consumers with the middlemen offering lower prices to farmers and charging higher prices from the consumers.

**“PRICES ARE INCREASING CONSTANTLY BUT NOT PROFITS”.**

#### **10. Objectives:**

The objective is to develop an automated and user-friendly application that utilizes image processing and neural networks to detect crop price that will make farmers to lead the profits. By analysing images of the crop provided, the application aims to extract relevant features and classify it. After Classification, it takes the parameters from the user to detect price. The goal is to enable early detection, of price of product before selling it.

#### **11. Importance of the proposed project in the context of present scenario:**

The price prediction of crops using ML holds significant importance in the present scenario for the following reasons:

- ❖ **Market Volatility:** Agricultural markets are susceptible to volatility due to various factors such as weather conditions, global trade dynamics, and supply-demand imbalances. ML-based price prediction models can help stakeholders navigate this volatility by providing timely and accurate forecasts, enabling them to make informed decisions and mitigate financial risks.
- ❖ **Profitability and Sustainability:** Accurate crop price prediction empowers farmers to optimize their production decisions, including crop selection and resource allocation. By aligning their farming practices with market demands, farmers can enhance profitability, minimize wastage, and promote sustainable agricultural practices.

## **12. Preliminary work carried out in line with proposed idea.**

Preliminary work carried out in line with price prediction of crop using ML typically involves several key steps:

**1. Data Collection:** Relevant historical data on crop prices, as well as factors influencing price fluctuations, such as weather data, market trends, and policy changes, are collected. This data serves as the foundation for training and validating ML models.

**2. Data Preprocessing:** The collected data is processed to ensure its quality and suitability for analysis. This may involve tasks such as cleaning the data, handling missing values, normalizing or scaling the features, and transforming the data into a suitable format for ML algorithms.

**3. Feature Selection/Engineering:** Features that are most relevant and influential in predicting crop prices are identified and selected. Additionally, new features may be engineered from the existing data to capture more meaningful patterns and relationships that can aid in accurate price prediction.

**4. Model Selection:** Various ML algorithms such as regression models, decision trees, support vector machines, or neural networks are evaluated and compared to determine the most suitable model for the specific crop price prediction task. The choice of model depends on factors such as the data characteristics, desired accuracy, interpretability, and computational requirements.

**5. Model Training and Evaluation:** The selected ML model is trained using the prepared dataset. The dataset is divided into training and testing subsets to assess the model's performance. Evaluation metrics such as mean squared error (MSE), root mean squared error (RMSE), or mean absolute error (MAE) are used to measure the accuracy of the model's price predictions.

**6. Iterative Improvement:** The model's performance is analyzed, and further iterations are carried out to refine the model and enhance its predictive capabilities. This may involve adjusting hyperparameters, exploring different feature combinations, or incorporating more advanced ML techniques.

The preliminary work lays the foundation for the development of a robust and accurate ML-based crop price prediction model. It sets the stage for further refinement, model optimization, and integration into real-world applications for informed decision-making in the agricultural industry.

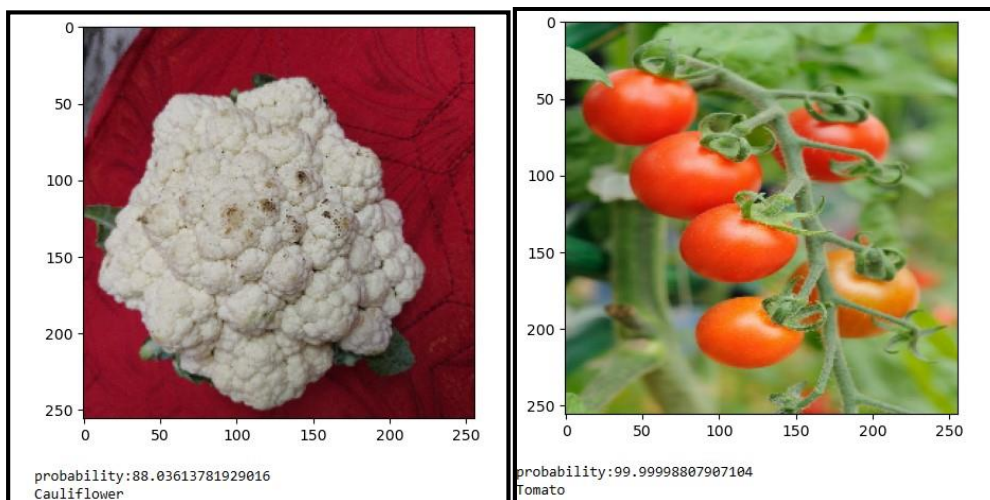
**13. Estimated Budget in Rs.: (Student will get full support from MSME, Faculty 50%)**

Sl.	Items	Project Cost (Own share)	MSME support
i.	Outsourcing charges for R&D/Design Engg./Consultancy/Testing/Expert cost	3L	
ii.	Raw materials/consumables/spares	2.5L	
iii.	Fabrication/synthesis charges of working model or process	2L	
iv.	Business travel and event participation Fees (Ceiling of 10% of approved project cost)	1.5L	
v.	Patent Filing Cost (PCT- Ceiling of 10% of approved project cost)	1.5L	
vi.	Contingency (Ceiling of 10% of approved project cost)	1.5L	
<b>Total in Lakh</b>		<b>12L</b>	

**14. Expected Output:**

By the end of this we will find out the reasonable price of the crop for beneficiary.

By scanning we can get the name of the crop as below:



After the completion of this step it requires some parameters which is given by user and finally get the price of the crop as below:

Name: Tomato

Price per kg: 70

