

The background is a dark blue gradient with a subtle pattern of white dots. On the left side, there are several concentric circles and a large circular scale with degree markings from 140 to 260. The scale is marked with small tick marks and larger numbers at 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, and 260. There are also some dashed lines and arrows pointing in different directions, creating a technical or scientific feel.

# SYNOPSIS

## COTTON DISEASES DETECTION

# INTRODUCTION

Cotton, a significant cash crop, plays a vital role in the global textile industry. But, due to various diseases the yield and quality of cotton is decreasing leading to agricultural as well as economical losses. By early detection and proper management, we can reduce the risks associated with cotton. Our model aims to develop a deep learning-based model for the detection of cotton diseases using image data of cotton leaves. Our model will be able to automatically detect cotton diseases based on their symptoms. The model will use various deep learning techniques such as convolutional neural networks (CNNs), to achieve this goal.

# PROBLEM STATEMENT

Cotton is a crucial cash crop in many parts of the world, and cotton leaf disease can significantly reduce crop yield and quality. Early detection of cotton leaf disease is essential to prevent its spread and minimize its impact. However, visual inspection by human experts can be time-consuming, labor-intensive, and prone to errors. Therefore, there is a need for an accurate, automated system for cotton leaf disease detection that can quickly and reliably detect disease symptoms in cotton leaves. This project aims to develop such a system using deep learning algorithms to analyze images of cotton leaves and accurately identify disease in real-time. Develop a deep learning model capable of detecting cotton diseases equipping image data, helping farmers detect cotton disease.

# OBJECTIVES

- To develop a deep learning-based system for precisely detecting cotton leaf diseases which will employ image data to identify diseases.
- To provide cotton cultivators with a reliable tool for early detection of diseases associated with cotton plants.



# DATASET

1. We have collected freely available dataset from the storage uploaded by Krish Naik.
2. Dataset contains 2767 total images.
3. Dataset has been classified into three categories
  - (i) Training (ii) Testing (iii) Validation.
4. Each category has 4 classes-
  - (a) Disease cotton leaf (b) Disease cotton plant (c) Fresh cotton leaf and (d) Fresh cotton plant

# METHODOLOGY

1. Collection and preprocessing of image dataset containing cotton leaves with various diseases.
2. Design and augmentation of a CNN-based model for cotton disease detection. CNN is a kind of network architecture for deep learning algorithms and is specifically used for image recognition and tasks that involve the processing of pixel data.
3. Evaluation of the model's performance using appropriate metrics (e.g., accuracy, precision, resNet152V2, recall, F1-score).
4. Deployment of the developed model in a user-friendly model for real-world use.

# EXPECTED OUTCOME

The expected outcome of this model is a deep learning model with high accuracy in detecting cotton diseases. The model will be easy to use and accessible for farmers to improve their crop yield and health.

# FACILITIES REQUIRED FOR PROPOSED WORK

1. High-performance computer or cloud-based resources with GPU support for deep learning model development and training.
2. Access to relevant image datasets of cotton diseases and healthy leaves.
3. Deep learning frameworks and libraries (e.g., TensorFlow & Keras) for model development and training.
4. Software tools for preprocessing and data augmentation (e.g., OpenCV, Python libraries).



# THANK YOU

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