RIPHAH INTERNATIONAL UNIVERSITY

Faculty of Computing
FINAL YEAR PROJECT INITIAL PROPOSAL

Rice Leaf Diseases Detection

Project Team

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Project Proposal

Project Title: Rice Leaf Diseases Detection

Description

Overview

Rice is a staple food for over half of the world's population but is highly prone to diseases such as *Bacterial Leaf Blight, Brown Spot, Leaf Blast, Leaf Scald,* and *Sheath Blight*, which threaten global food security.

Objective

- Develop a **machine learning-powered rice leaf disease detection system**.
- Build a **React + Tailwind CSS frontend** for user interaction.
- Implement a **Node.js + Express backend** for API handling and model integration.
- Use **MongoDB** for storing user data, predictions, and history.

Scope

- Upload rice leaf images and receive instant predictions with disease type and confidence score.
- Provide preventive measures for detected diseases.
- Store records securely for analysis and research.
- Train and deploy a deep learning model using a dataset of **3829 images across 6 disease classes**.

Contribution Towards Society

- Helps **farmers** by enabling early disease detection and reducing crop losses.
- Assists the **agriculture industry** in saving resources and time.
- Supports **researchers** in disease monitoring and pattern analysis.

- Strengthens **food security** by improving rice productivity.

Expected Outcomes

- A functional web-based disease detection platform.
- High accuracy classification of rice leaf diseases.
- A user-friendly dashboard for farmers and experts.
- Secure data storage and potential for trend analysis in future.

Limitations

- **Dataset constraints** (limited diversity, image quality variations).
- **Hardware dependency** (camera quality, internet access in rural areas).
- **Model generalization** challenges with new diseases or rice varieties.
- **Language and accessibility** barriers requiring localization.