

Potato Disease Detection: Empowering Farmers with AI

Smallholder potato farmers often face significant challenges in identifying plant diseases early. This can lead to devastating crop losses and severe financial hardship. Our innovative AI-powered solution aims to transform disease detection, providing rapid, accurate diagnoses and actionable treatment recommendations.



The Challenge: Early Detection for Greater Yields



Struggling with Identification

Farmers frequently lack immediate access to agricultural experts or the resources needed for timely disease identification.



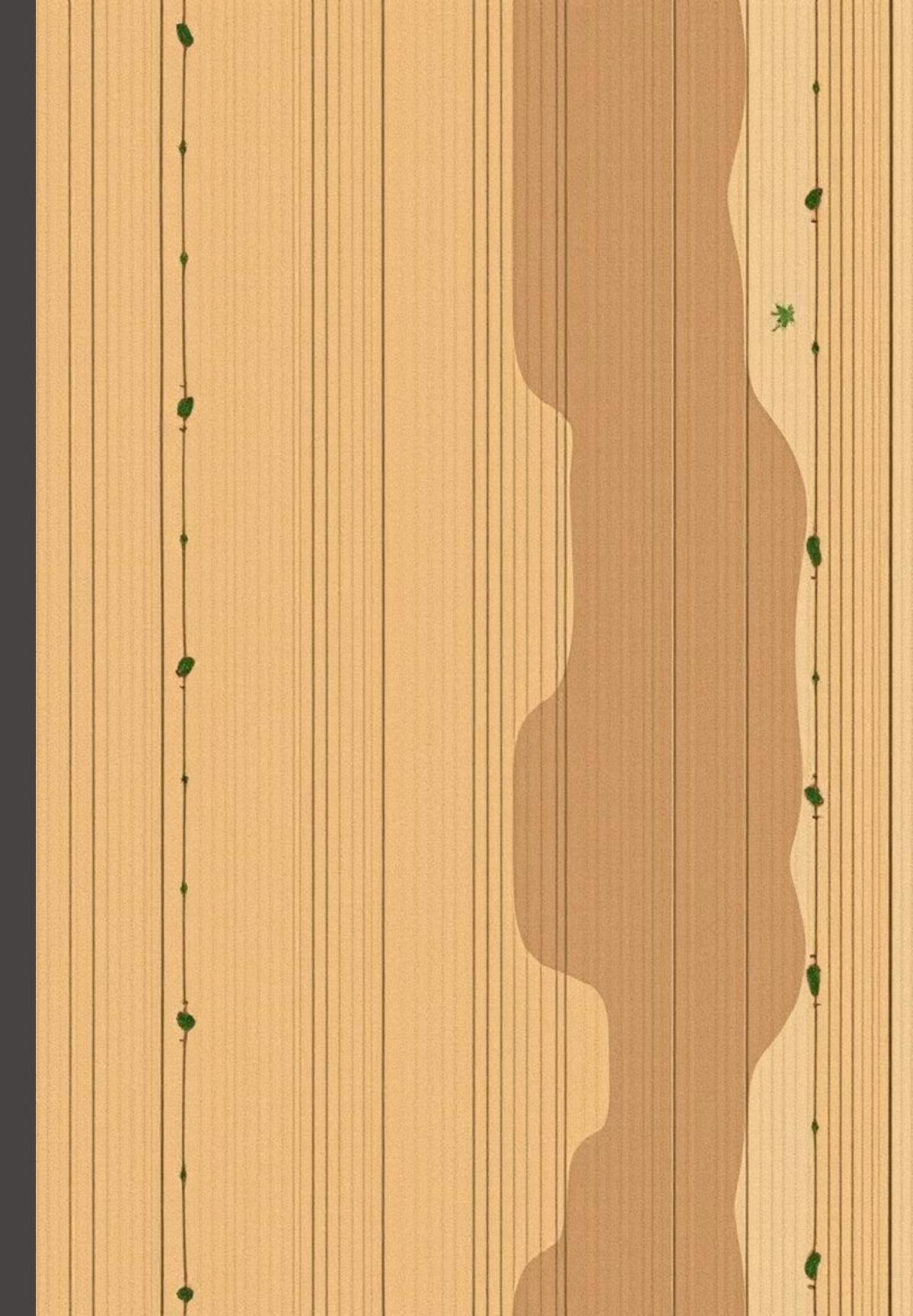
Reduced Yield & Income

Delayed or incorrect diagnoses result in significant reductions in potato yield, directly impacting farmers' livelihoods and regional food security.



The Urgency of Timeliness

Many potato diseases spread rapidly; early intervention is crucial to saving crops and preventing widespread infestation.



The Solution: AI-Powered Disease Diagnostics

Leveraging the widespread availability of smartphones, our system harnesses the power of Artificial Intelligence to bring expert agricultural insights directly to farmers' fingertips. By simply taking a picture of a potato leaf, farmers can receive instant, reliable disease diagnoses.

Smartphone Integration

Utilising common mobile devices to capture leaf images, making advanced diagnostics accessible to all.



AI Image Recognition

An AI model analyses leaf images to identify specific potato diseases with high accuracy, eliminating guesswork.



Instant Recommendations

Provides immediate, practical treatment suggestions, including appropriate pesticides and application methods.

Our Objectives: Accessible & Effective Tools

1 Accurate AI Disease Detection

To develop a robust Convolutional Neural Network (CNN) capable of precisely identifying various potato leaf diseases from photographic input.

2 Actionable Treatment Recommendations

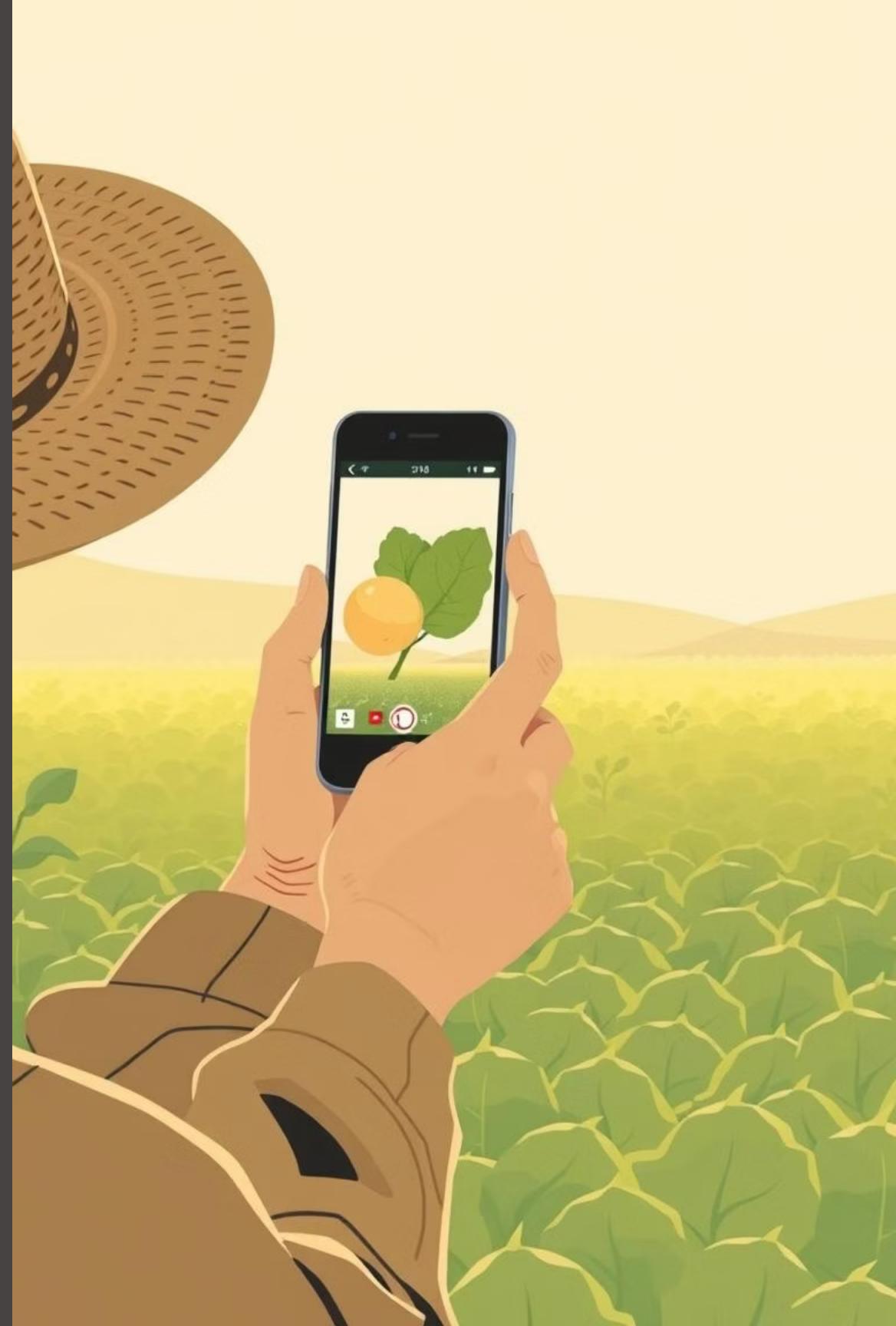
To provide clear, concise advice on pesticides and treatments, tailored to the identified disease and optimal for local conditions.

3 Simple, Multilingual Interface

To design a user-friendly interface that supports multiple languages, ensuring ease of use for a diverse farming community.

4 Optimised for Low-Resource Environments

To ensure the system functions effectively even with limited internet connectivity and basic smartphone models, reaching underserved regions.



Current Features: What We Offer Now

1

Image Upload Functionality

Farmers can easily upload images of potato leaves via the platform for analysis.

2

CNN-Based Detection

Engine Our core AI model, built on Convolutional Neural Networks, efficiently processes images to detect specific diseases.

3

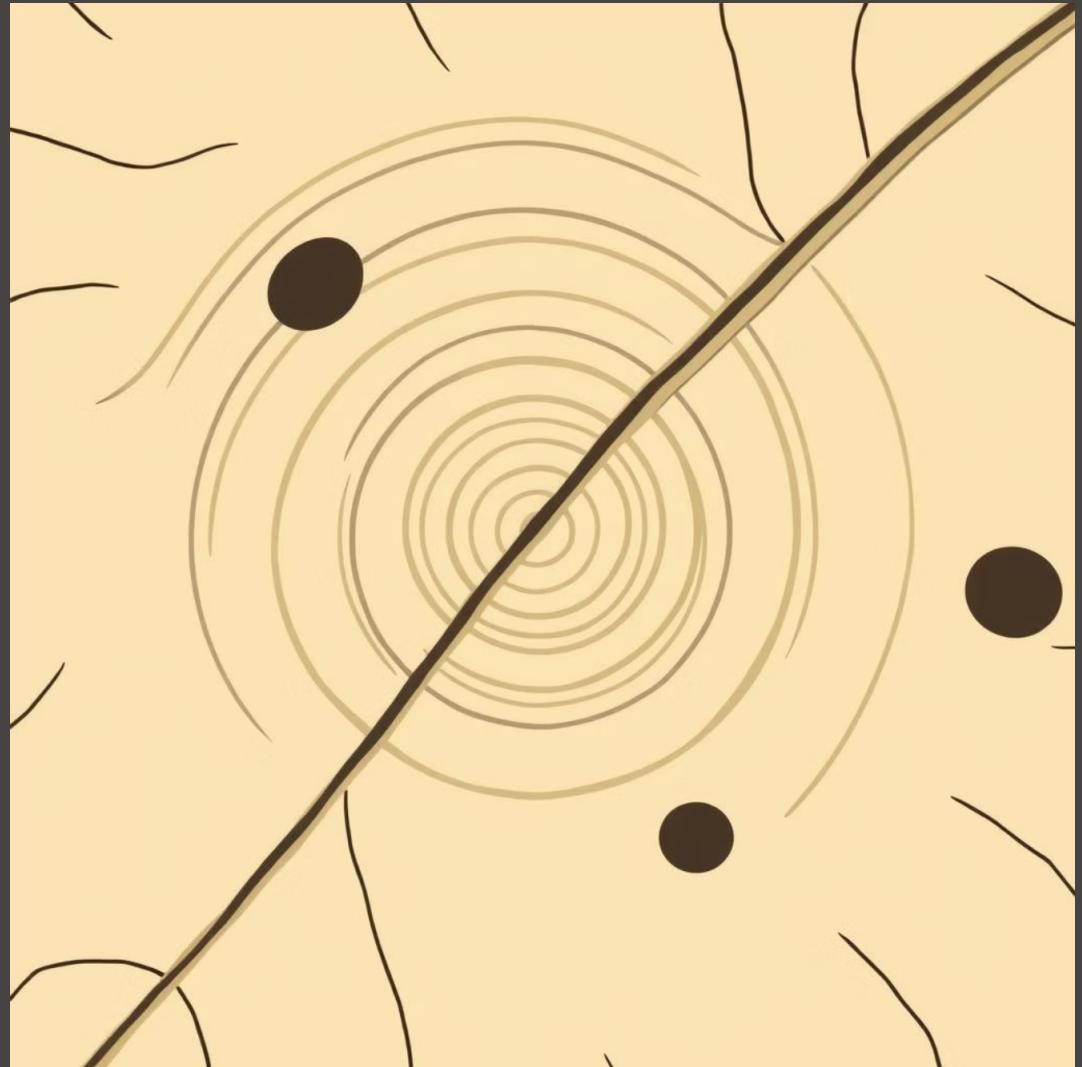
Pesticide Suggestion

System Integrated recommendations provide guidance on suitable pesticides and treatment protocols once a disease is identified.

4

Basic Disease

Database A foundational database of common potato diseases supports the AI's diagnostic capabilities and recommendation engine.



Technology Stack: Powering the Innovation

Our system is built on a robust and scalable technology stack, ensuring reliable performance and future expandability.



Frontend: React / Android

A responsive and intuitive user interface developed with React, with an optional native Android application for seamless mobile experience.



Backend: FastAPI (Python)

A high-performance and modern web framework in Python, providing speedy and efficient processing of requests and data.



AI Model: CNN

Utilising Convolutional Neural Networks (CNNs) for superior image recognition and accurate disease classification.



Future Enhancements: Expanding Our Impact



Community Forum

A dedicated platform for farmers to share knowledge, ask questions, and support each other.



Weather & Soil Awareness

Integrating local weather and soil data for more precise, context-specific recommendations.



Offline Model Support

Enabling disease detection even without internet access, crucial for remote farming areas.



Multi-Label Detection

Advanced AI capable of identifying multiple diseases on a single leaf image, for comprehensive diagnosis.

Broader Accessibility & Localisation



Dedicated Mobile App

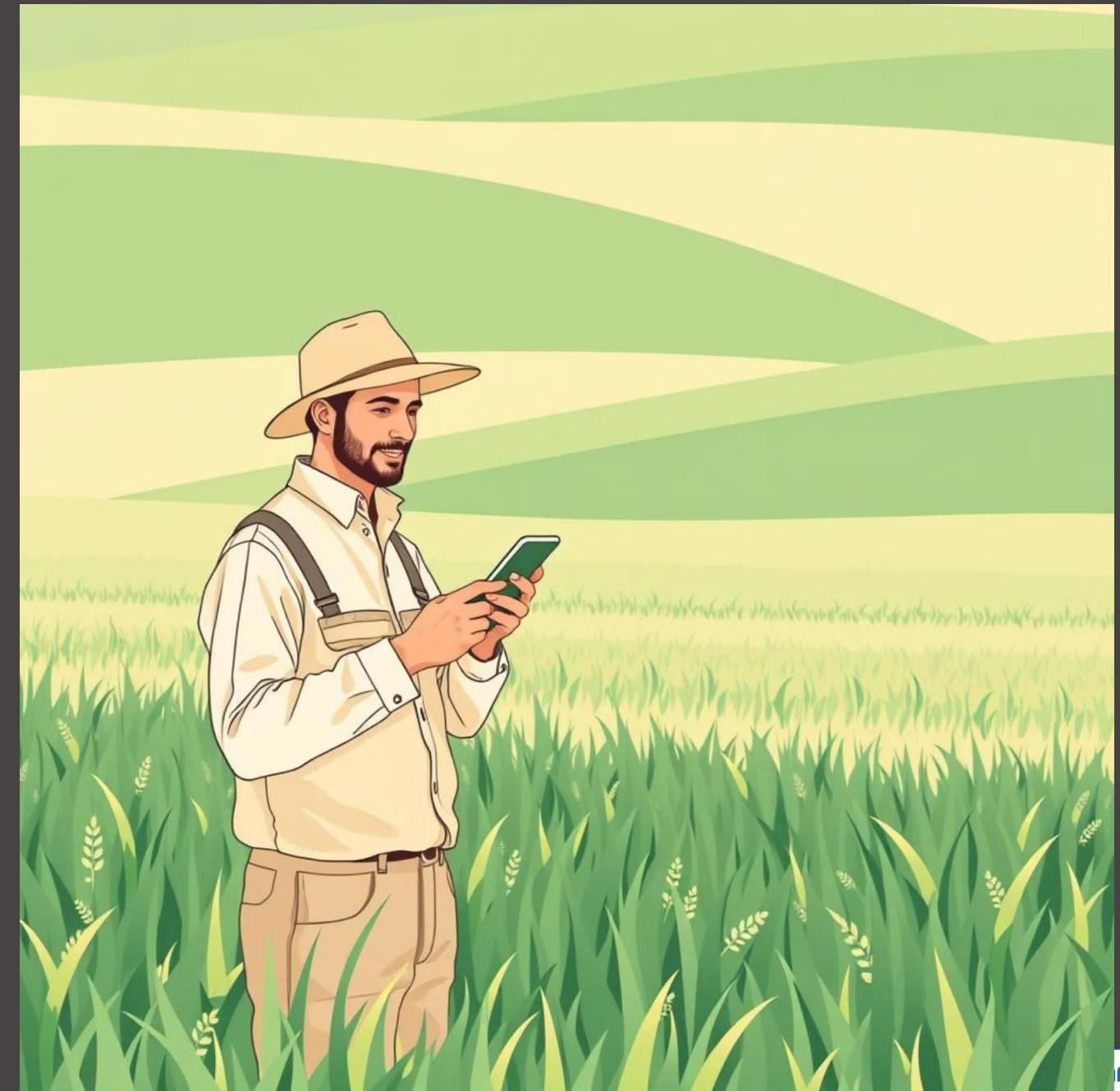
A standalone application for enhanced functionality and a smoother user experience.

Pesticide Shop Locator

GPS-enabled feature to help farmers find the nearest agricultural supply stores.

Bangla Voice Interaction

Enabling interaction through voice commands and responses in Bangla, catering to regional linguistic needs.



Conclusion: A Brighter Future for Potato Farmers

Our AI-powered potato disease detection system represents a significant step towards empowering smallholder farmers. By providing quick, accurate diagnoses and treatment recommendations, we aim to minimise crop loss, improve yields, and enhance food security.

This system will help farmers detect potato diseases and find suitable treatments quickly, reducing financial losses and improving food security.

- Future developments will integrate advanced features like offline support, localised language interaction, and community platforms, ensuring widespread accessibility and continuous improvement.



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Thank You