FarmSight – AI Crop Stress Detection Platform

An AI-powered platform that detects early crop stress (drought, pest, or nutrient deficiency) using satellite imagery and Huawei Cloud AI, sending actionable alerts to farmers via web and mobile interfaces.

Overview

FarmSight leverages cutting-edge satellite technology and machine learning to help farmers monitor crop health in real-time. By analyzing NDVI (Normalized Difference Vegetation Index) data from satellite imagery, our platform can detect crop stress up to 7 days before visible symptoms appear, enabling proactive intervention.

Completed Features:

Mobile App (Flutter)

- Cross-platform mobile app with modern UI
- Interactive map dashboard with farm visualization
- Real-time NDVI charts and stress indicators
- Weather information widget
- State management with Provider
- Google Maps integration

Website (React + Vite.js)

- Professional landing page with hero section
- Farm registration system with form validation
- Dashboard for monitoring multiple farms
- Educational video hub with categorized content
- Responsive design with Tailwind CSS
- Navigation and routing

Backend API (Node.js/Express)

- RESTful API with comprehensive endpoints
- Google Earth Engine integration for satellite data
- Huawei Cloud services integration
- YouTube API for educational content
- NDVI calculation and forecasting logic
- Alert system architecture

AI/ML Features

- NDVI calculation from satellite imagery
- Crop stress detection and classification
- 7-30 day stress forecasting with confidence intervals
- Personalized video recommendations based on stress type
- Smart notification system

Educational Platform

- Video education hub with categories
- Search functionality
- Progress tracking
- Personalized recommendations
- Integration with YouTube API

Technology Stack:

- **Mobile:** Flutter, Provider, Google Maps, FL Chart
- **Web:** React, Vite.js, Tailwind CSS, React Router
- **Backend:** Node.js, Express.js, JWT authentication
- **Cloud:** Huawei Cloud (ModelArts, OBS, GaussDB, FunctionGraph)
- **External APIs:** Google Earth Engine, YouTube Data API

Key Capabilities:

1. **Early Detection:** Detect crop stress up to 7 days before visible symptoms
2. **Real-time Monitoring:** Continuous satellite imagery analysis
3. **Smart Alerts:** Multi-channel notification system
4. **Educational Content:** Curated videos for farmer education
5. **Predictive Analytics:** NDVI forecasting with confidence intervals
6. **User-friendly Interface:** Intuitive mobile and web interfaces