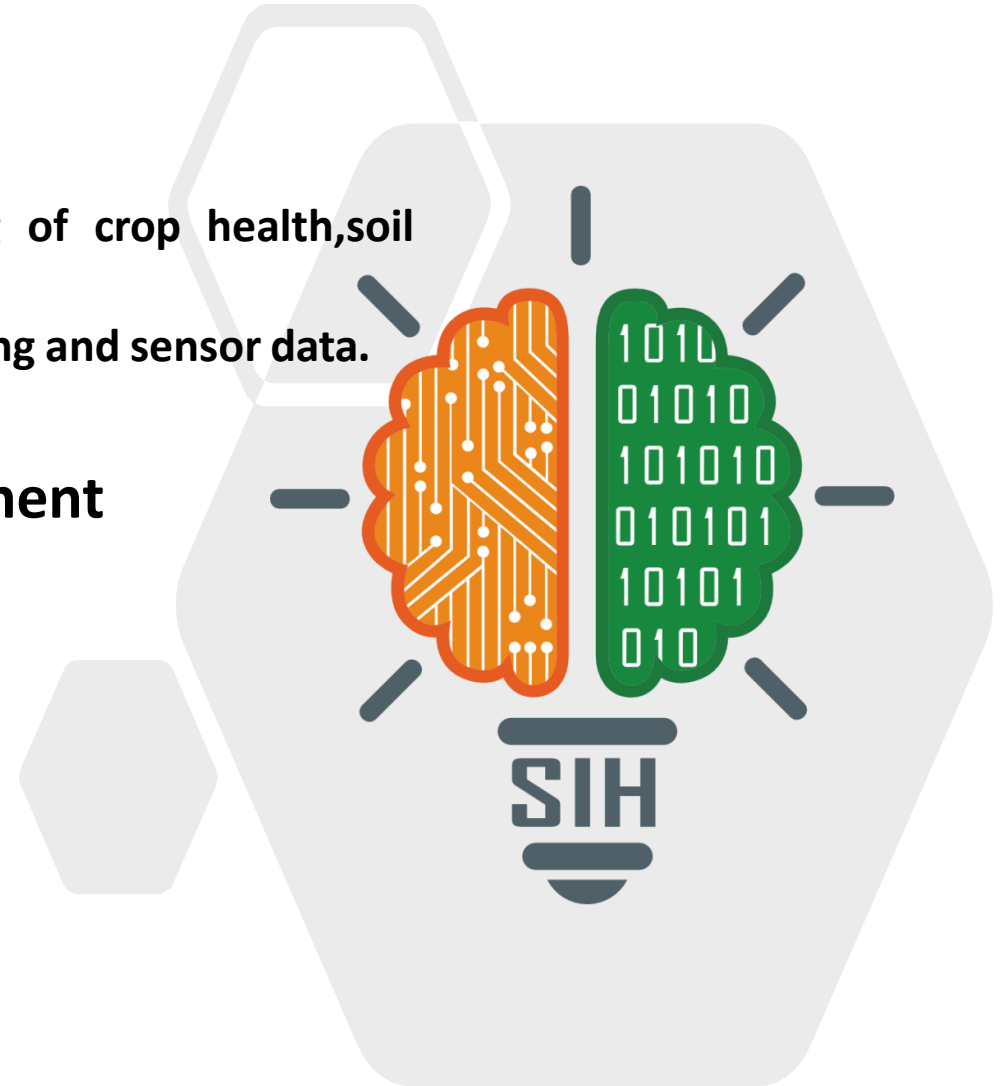


# SMART INDIA HACKATHON 2025



## TITLE PAGE

- **Problem Statement ID – SIH25099**
- **Problem Statement Title-** AI-powered monitoring of crop health, soil condition, and pest risks using multispectral/hyperspectral imaging and sensor data.
- **Theme-** Agriculture, FoodTech & Rural Development
- **PS Category-** Software
- **Team ID-** 103674
- **Team Name-** Zero Degree



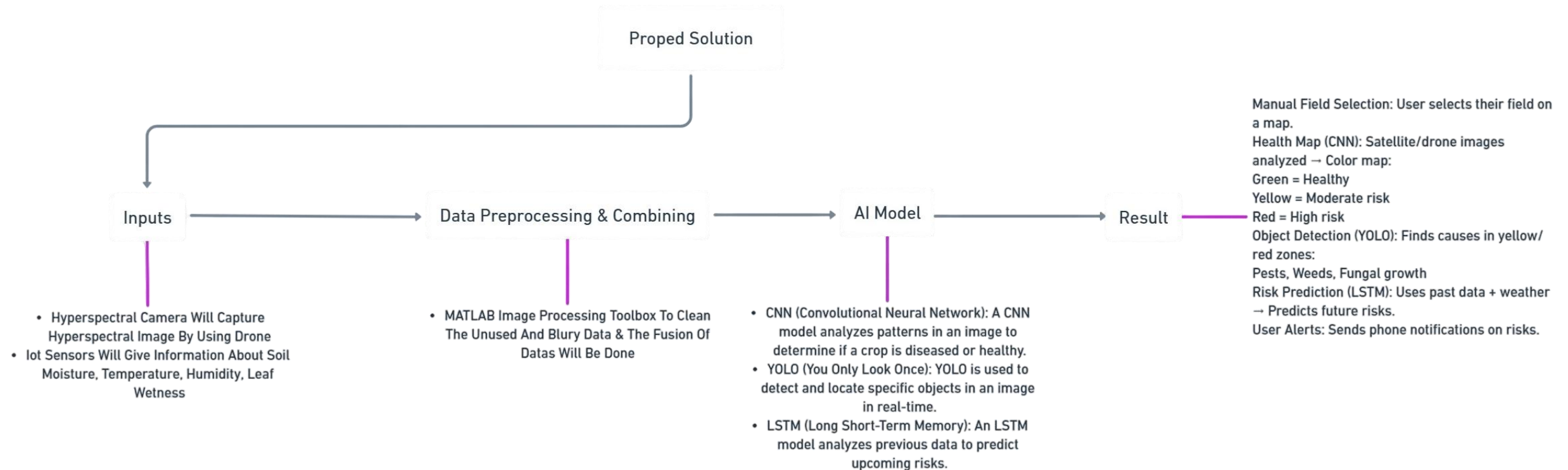


# IDEA TITLE

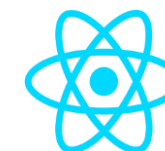
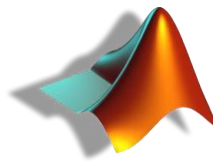
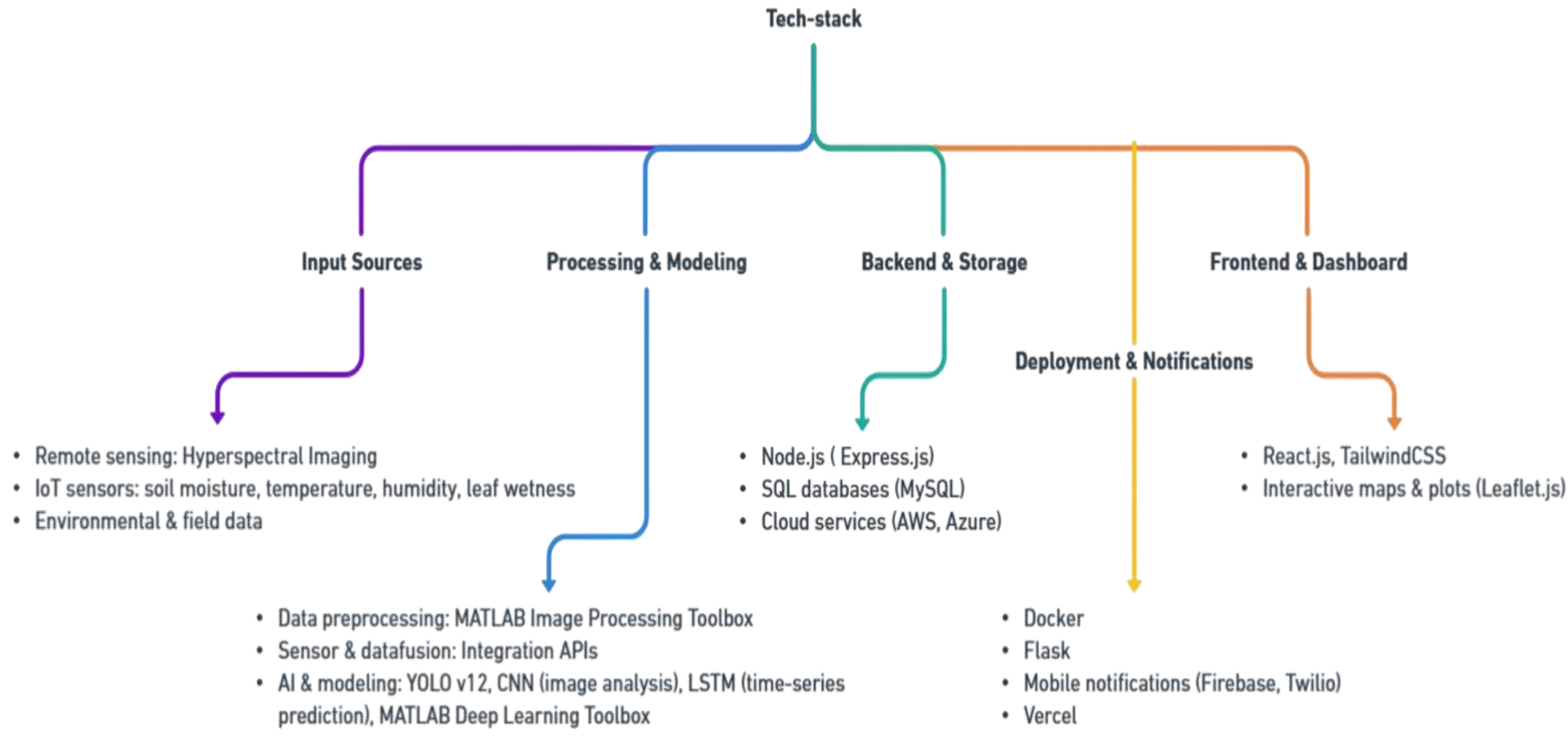


AgriAI is an **AI-powered precision agriculture platform** that provides real-time insights for both **global fields** and **custom user-selected lands** (via latitude & longitude). It integrates **remote sensing, environmental sensors, and AI models** to detect soil degradation, weather risks, and pest outbreaks early.

## ❖ Proposed Solution



# TECHNICAL APPROACH



## Feasibility:

- Technically possible with hyperspectral/multispectral imaging, IoT sensors, AI/ML (CNN, LSTM), and cloud processing.
- Integration-ready with existing farm machinery, drones, and satellite data, making deployment seamless without major infrastructure changes.
- Adoption is realistic, since farmers, agronomists, and researchers already use mobile apps and dashboards for crop management.

## Challenges:

- Competition from existing agri-tech platforms (e.g., CropIn, SatSure, Plantix).
- Scalability issues with large-scale image/sensor data processing.
- Data privacy & security risks, especially with farm-level and geolocation data.
- Connectivity gaps in rural areas (low bandwidth, poor internet access).

## Strategies:

- AI-driven stress/pest prediction, spectral anomaly alerts and real-time dashboards.
- Use cloud scaling & edge processing to handle large datasets efficiently.
- Ensure data security & compliance (end-to-end encryption, secure cloud storage, farmer data ownership).
- Offline/low-bandwidth modes with SMS/USSD or lightweight mobile notifications for rural users.



# IMPACT AND BENEFITS



## Potential Impact on Target Audience

- **Farmers:** The platform enables early problem detection, boosts yields, cuts input costs, supports proactive decisions, and delivers insights through an easy-to-use mobile dashboard.
- **Researcher:** The platform fuses spectral, sensor, and historical data with AI models for scalable, evolving crop and soil health insights.
- **Agronomist:** The platform delivers precise, data-backed, and localized crop insights, replacing labor-intensive monitoring with fast, automated analysis.

## Benefits of the Solution

- **Social Benefits:** Enhances management, supports remote learning, and enables inclusive participation.
- **Environmental Benefits:** Reduces chemical overuse, conserves water, and preserves soil health, promoting sustainable and eco-friendly farming.
- **Economic Benefits:** Reduces travel costs, saves time, and creates opportunities for digital businesses.
- **Technological Benefits:** Promotes innovation through AI integration, real-time translation, and secure collaboration.



# RESEARCH AND REFERENCES



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