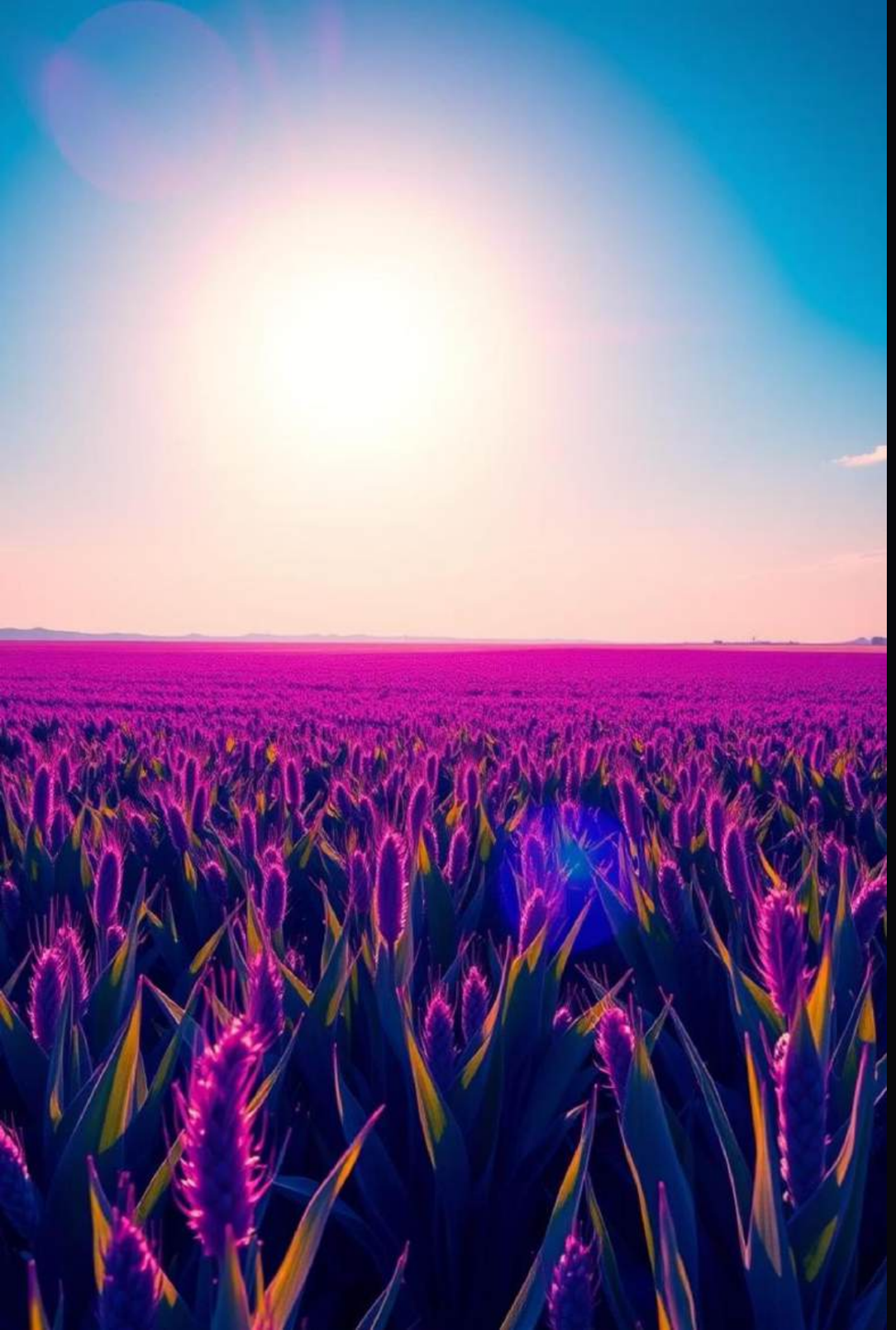


Crop Yield Prediction using ML

SDG 2 – Zero Hunger

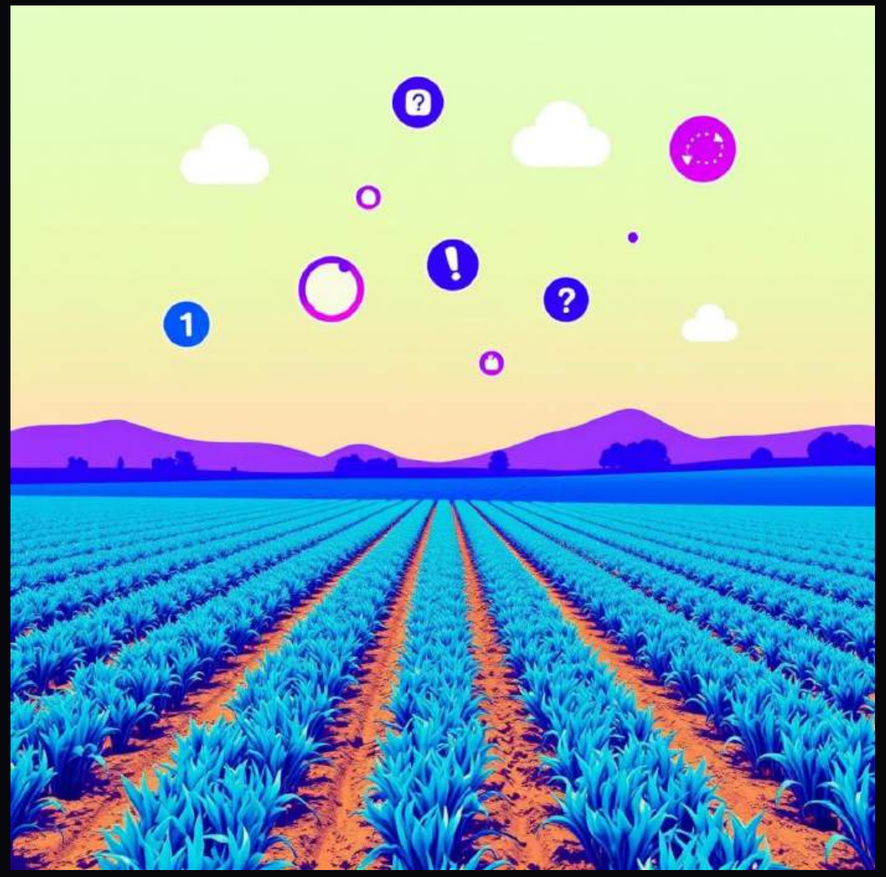
Presented by Zethu L. Sithole

by zetu sithole

Addressing Food Security Through Predictive Analytics

Unpredictable crop yields pose significant threats to global food security and the economic stability of farming communities. Factors such as climate change, pest infestations, and soil degradation contribute to this variability, making it challenging for farmers and policymakers to plan effectively.

Our primary goal is to accurately predict crop yields using machine learning, leveraging comprehensive weather and agricultural datasets to mitigate these risks and foster more resilient food systems.



Methodology and Tools for Yield Prediction

Supervised Learning (Regression)

We employ supervised learning techniques, specifically regression models, to establish relationships between input features (weather, soil) and target variables (crop yield).

Algorithms Utilized

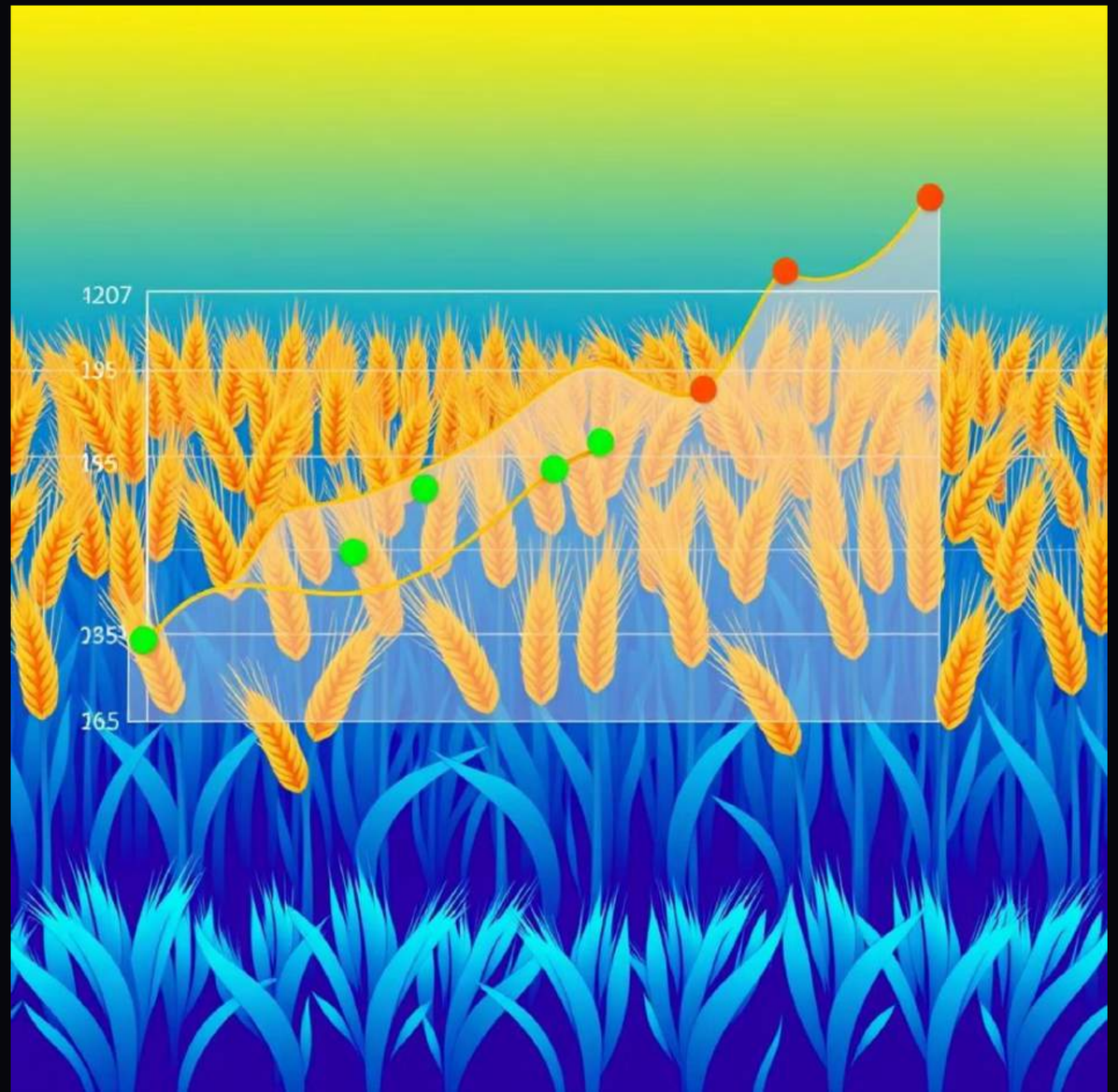
Our core algorithms include Linear Regression for its interpretability and Random Forest for its robustness in handling complex, non-linear relationships within agricultural data.

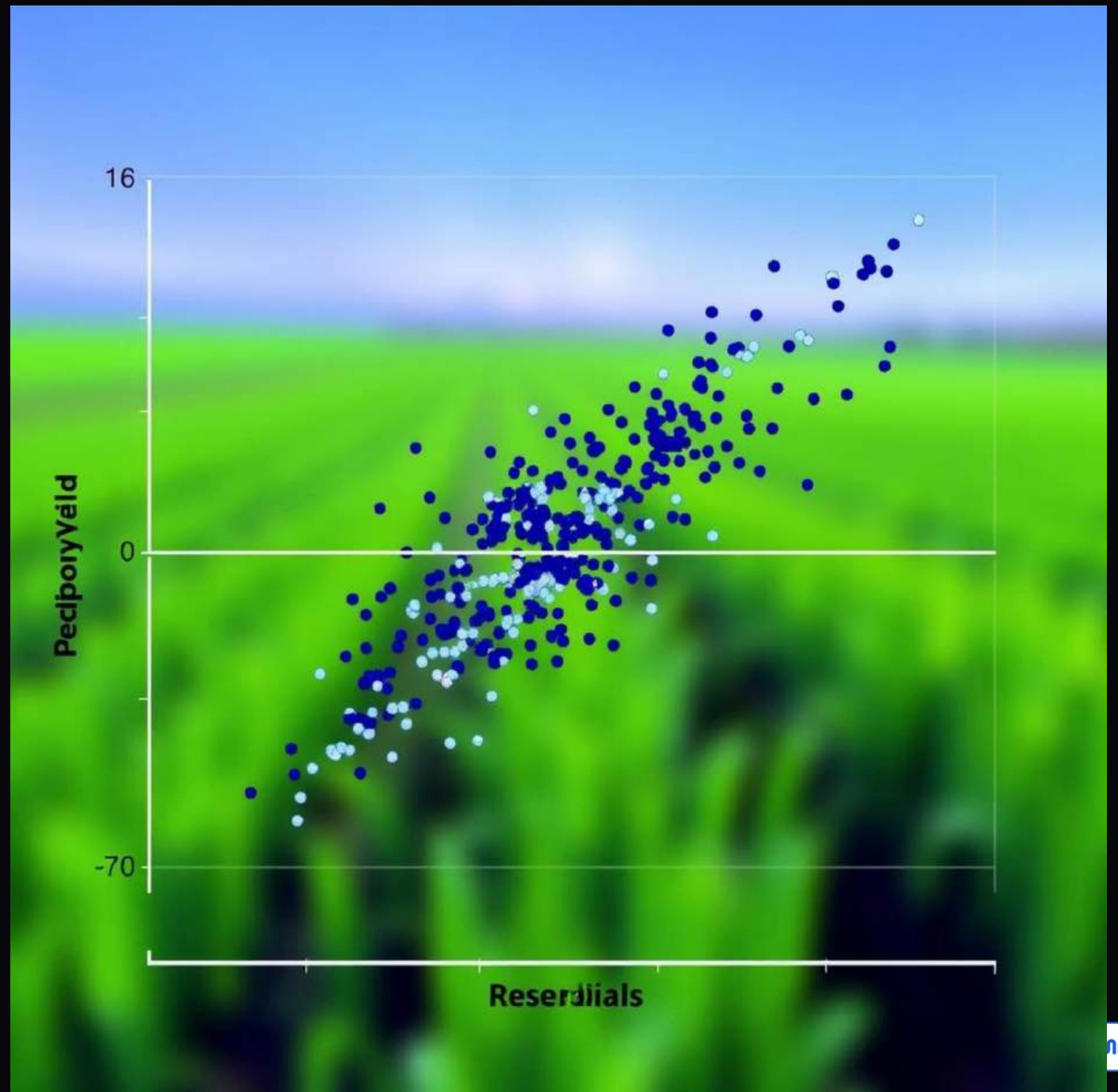
Dataset & Tools

The model is trained on a comprehensive Kaggle crop yield dataset. Development is done in Python, leveraging Scikit-learn for ML tasks and Google Colab for cloud-based execution.

Model Performance & Results

Our Random Forest model significantly outperforms Linear Regression, demonstrating a higher accuracy and better predictive power for crop yields.





Impact, Ethics & Next Steps

1

Positive Impact

This model empowers farmers and governments to optimize resource allocation, leading to increased efficiency and a stronger fight against global hunger.

2

Ethical Considerations

Using publicly available data, we acknowledge potential biases. The tool is designed to support, not replace, expert decision-making in agriculture.

3

Future Enhancements

Next steps include deploying the model as a user-friendly web application and integrating real-time weather data for dynamic, up-to-the-minute predictions.