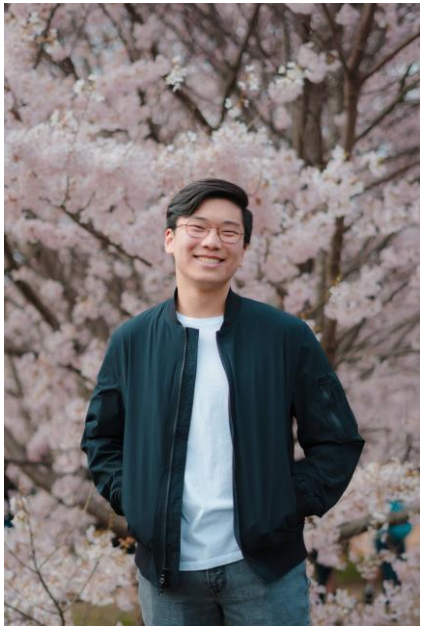
AgroDetect

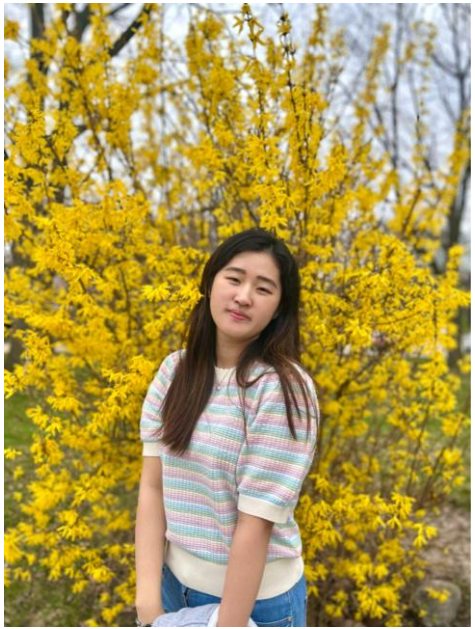
A Web Application for Detecting and Tracking Crop Disease and Pests

Who are we?

Joe Ku



Claudia Lee



Computer Science + Crop Sciences at UIUC !!

Predict + Decide + Act early

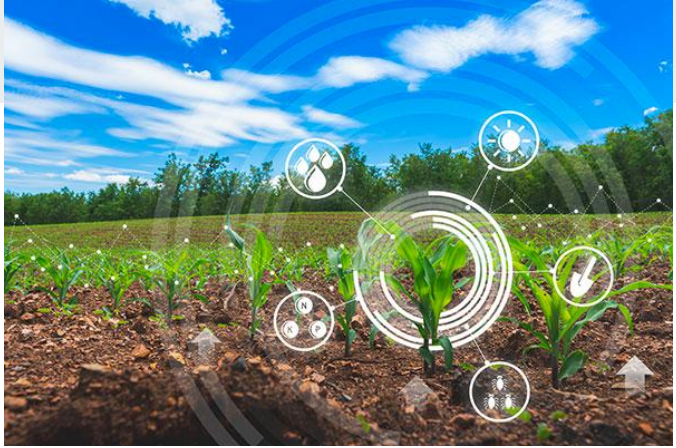
= Successful Farming

Motivation

To assist farmers in identifying crop diseases and pests accurately and in a timely manner.

To monitor the spread of crop diseases and pests, and alert farmers to potential threats.

To increase crop yields and improve food security by reducing losses due to pests and diseases.



Technologies

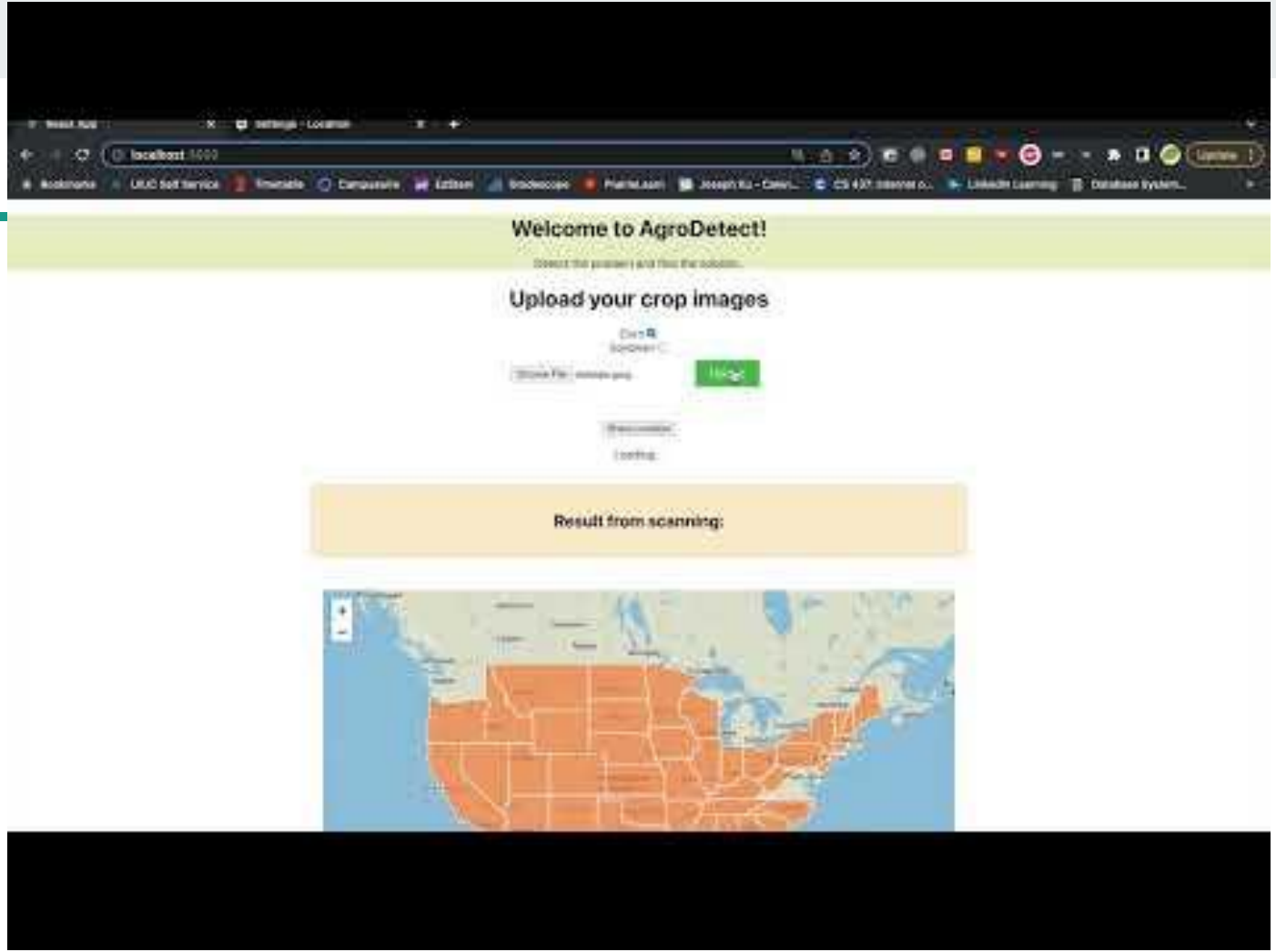
TensorFlow - used for machine learning models to detect crop damage.

Flask - used for web application development.

MongoDB and Mongoose - used for storing and retrieving report data and location information.

React - used for frontend development

Node.js and npm - used for starting the backend server.


Welcome to AgroDetect!
Upload your crop images
Result from scanning:

Welcome to AgroDetect!

Detect the problem and find the solution.

Upload your crop images

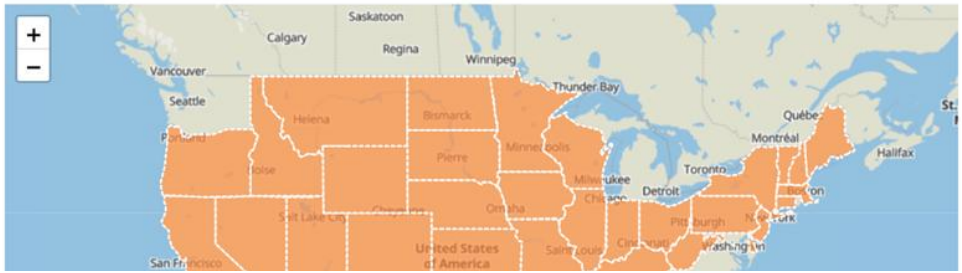
Corn ☐
Soybean ☐

Choose File No file chosen Upload

Share Location

Loading...

Result from scanning:



Welcome to AgroDetect!

Detect the problem and find the solution.

Upload your crop images

Corn ☑
Soybean ☐

Choose File healthy_test.jpeg Upload

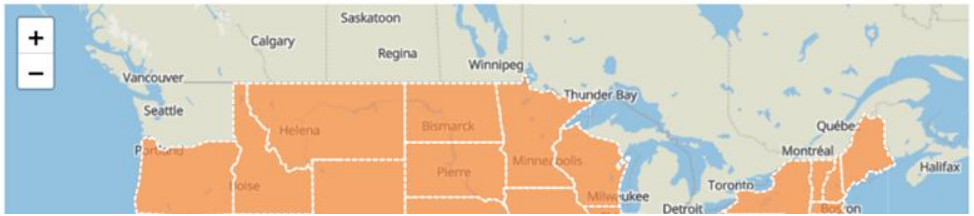
Share Location

There are 0 reports of the crop disease in 25 miles.

Result from scanning:

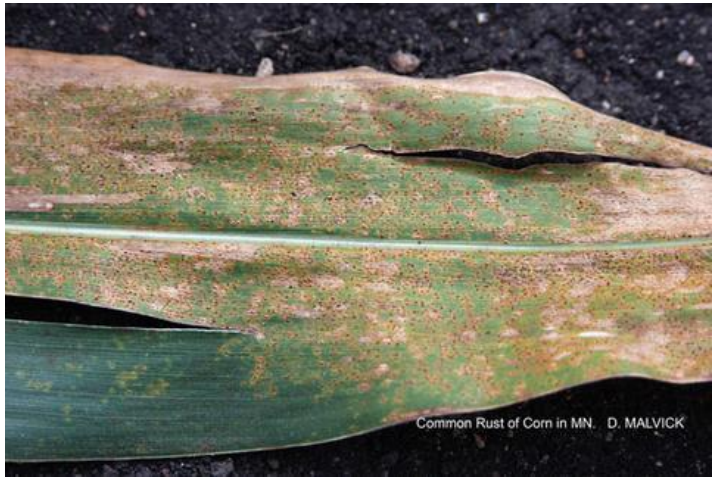
Healthy

No problems detected



Training the Models

```
2023-02-26 09:52:46.052644: I tensorflow/core/platform/cpu_feature_guard.cc:193] This TensorFlow binary is optimized
ith oneAPI Deep Neural Network Library (oneDNN) to use the following CPU instructions in performance-critical operati
ns:  AVX2 FMA
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
Epoch 1/10
  1/100 [..............................] - ETA: 3:40 - loss: 1.3818 - accurac
  2/100 [..............................] - ETA: 1:01 - loss: 1.7026 - accurac
  3/100 [..............................] - ETA: 57s - loss: 1.6255 - accuracy
  4/100 [>.............................] - ETA: 53s - loss: 1.5598 - accuracy
  5/100 [>.............................] - ETA: 50s - loss: 1.5197 - accuracy
  6/100 [>.............................] - ETA: 48s - loss: 1.4825 - accuracy
  7/100 [=>............................] - ETA: 48s - loss: 1.4318 - accuracy
  8/100 [=>............................] - ETA: 47s - loss: 1.3773 - accuracy
  9/100 [=>............................] - ETA: 46s - loss: 1.4371 - accuracy
 10/100 [==>...........................] - ETA: 46s - loss: 1.3916 - accuracy
 11/100 [==>...........................] - ETA: 46s - loss: 1.3725 - accuracy
 12/100 [==>...........................] - ETA: 45s - loss: 1.3494 - accuracy
 13/100 [==>...........................] - ETA: 45s - loss: 1.3398 - accuracy
 14/100 [===>..........................] - ETA: 45s - loss: 1.3246 - accuracy
 15/100 [===>..........................] - ETA: 47s - loss: 1.3119 - accuracy
 16/100 [===>..........................] - ETA: 51s - loss: 1.2807 - accuracy
 17/100 [====>.........................] - ETA: 51s - loss: 1.2619 - accuracy
 18/100 [====>.........................] - ETA: 51s - loss: 1.2348 - accuracy
 19/100 [====>.........................] - ETA: 52s - loss: 1.2154 - accuracy
 20/100 [=====>........................] - ETA: 52s - loss: 1.2037 - accuracy
 21/100 [=====>........................] - ETA: 54s - loss: 1.1816 - accuracy
 22/100 [=====>........................] - ETA: 53s - loss: 1.1668 - accuracy
 23/100 [=====>........................] - ETA: 52s - loss: 1.1556 - accuracy
 24/100 [======>.......................] - ETA: 50s - loss: 1.1390 - accuracy
 25/100 [======>.......................] - ETA: 49s - loss: 1.1270 - accuracy
 26/100 [======>.......................] - ETA: 48s - loss: 1.1328 - accuracy
 27/100 [=======>......................] - ETA: 47s - loss: 1.1225 - accuracy
 28/100 [=======>......................] - ETA: 46s - loss: 1.1104 - accuracy
 29/100 [=======>......................] - ETA: 46s - loss: 1.1143 - accuracy
 30/100 [========>.....................] - ETA: 45s - loss: 1.1009 - accuracy
 31/100 [========>.....................] - ETA: 45s - loss: 1.0961 - accuracy
```



Result from scanning:

Common Rust

Common Rust is a plant disease caused by the fungus Puccinia sorghi. Symptoms include oval to circular red to dark brown pustules on both leaf surfaces, which can lead to leaf chlorosis or death. The disease occurs in June or July when wind-carried urediniospores are introduced into the corn belt. Cool temperatures, heavy dews, and high humidity favor the disease. Resistant corn hybrids and early application of fungicides can help manage the disease.

[{"_id":"63fb03185fde8e0eae55e0c8","damage_cause":"pest1","longitude":10,"latitude":12,"reported_at":"2023-02-26T06:58:32.332Z","__v":0},
{"_id":"63fb031b5fde8e0eae55e0ca","damage_cause":"pest1","longitude":11,"latitude":12,"reported_at":"2023-02-26T06:58:35.660Z","__v":0},
{"_id":"63fb077dd92153b1307bbe17","damage_cause":"termite","longitude":-88.2248926,"latitude":40.1138356,"reported_at":"2023-02-26T07:17:17.164Z","__v":0},
{"_id":"63fb085ad92153b1307bbe1b","damage_cause":"termite","longitude":-88.2248897,"latitude":40.1138422,"reported_at":"2023-02-26T07:20:58.968Z","__v":0},
{"_id":"63fb08b2d92153b1307bbe1e","damage_cause":"termite","longitude":-88.2248938,"latitude":40.1138368,"reported_at":"2023-02-26T07:22:26.318Z","__v":0},
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{"_id":"63fb0c45d92153b1307bbe2a","damage_cause":"termite","longitude":-88.2248843,"latitude":40.1138521,"reported_at":"2023-02-26T07:37:41.778Z","__v":0}]

Location Tracking

- Optionally record the location of a report
- Search the database to count the number of reports in the nearby area


```
{
    "message": "Pest report created successfully",
    "createdPestReport": {
        "_id": "63fb8355b6ef05ce78886977",
        "damage_cause": "pest1",
        "longitude": -88.2248926,
        "latitude": 40.1138356,
        "reported_at": "2023-02-26T16:05:41.619Z"
    }
}
```


Query Params

	KEY	VALUE
☑	disease	termite
☑	longitude	-88.2248926
☑	latitude	40.1138356
☑	radius	10


```
{
    "count": 7
}
```



```
{
    "message": "All pest reports deleted"
}
```

Outlook

Increase the accuracy of the models and expand the range of pests and diseases that it can identify by processing large datasets.

More user-friendly design and additional features to make it easier for users to get crop diagnoses and information about pests and diseases.

Mobile version of the application could increase the number of reports and allow for easier use in the field.

The goal is to see the application used on a large scale to benefit farmers and food security.