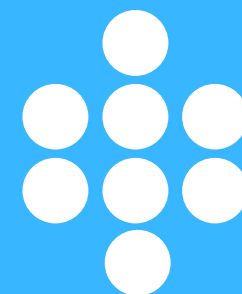# CCDC: Centre for Crop Disease Control

Team name: NEUON AI   Members: Chang Yang Loong, Sophia Chulif, Heng Kiat Jing, Danish Ezwan

Our focus

Agriculture

Problem statement

1. How can we create a sustainable farming solution?

2. How can we empower rural farmers to utilize data mining to improve their farm's efficiency while at the same time lowering their farm operating cost?

Introduction

Crops make up the vast majority of agricultural production

Farmers depend on healthy crop yield

Crop diseases result in the loss of crop yield and income

Importance of crop disease recognition

✚ Enable curative measures

✚ Prevent spread of disease

✚ Reduce crop loss

✚ Prevent recurring outbreaks in the future

Existing problems

Unavailability of human expertise

e.g. plant pathologist in rural farm

Outbreak and spreading of disease from slow crop disease detection
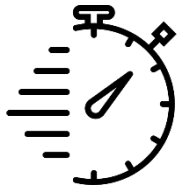
Solution

Plant expert knowledge **+** Machine ➡ Crop disease recognition assistant

How it will solve

Enable timely control response

Assist smallholder farmers without research infrastructure or support

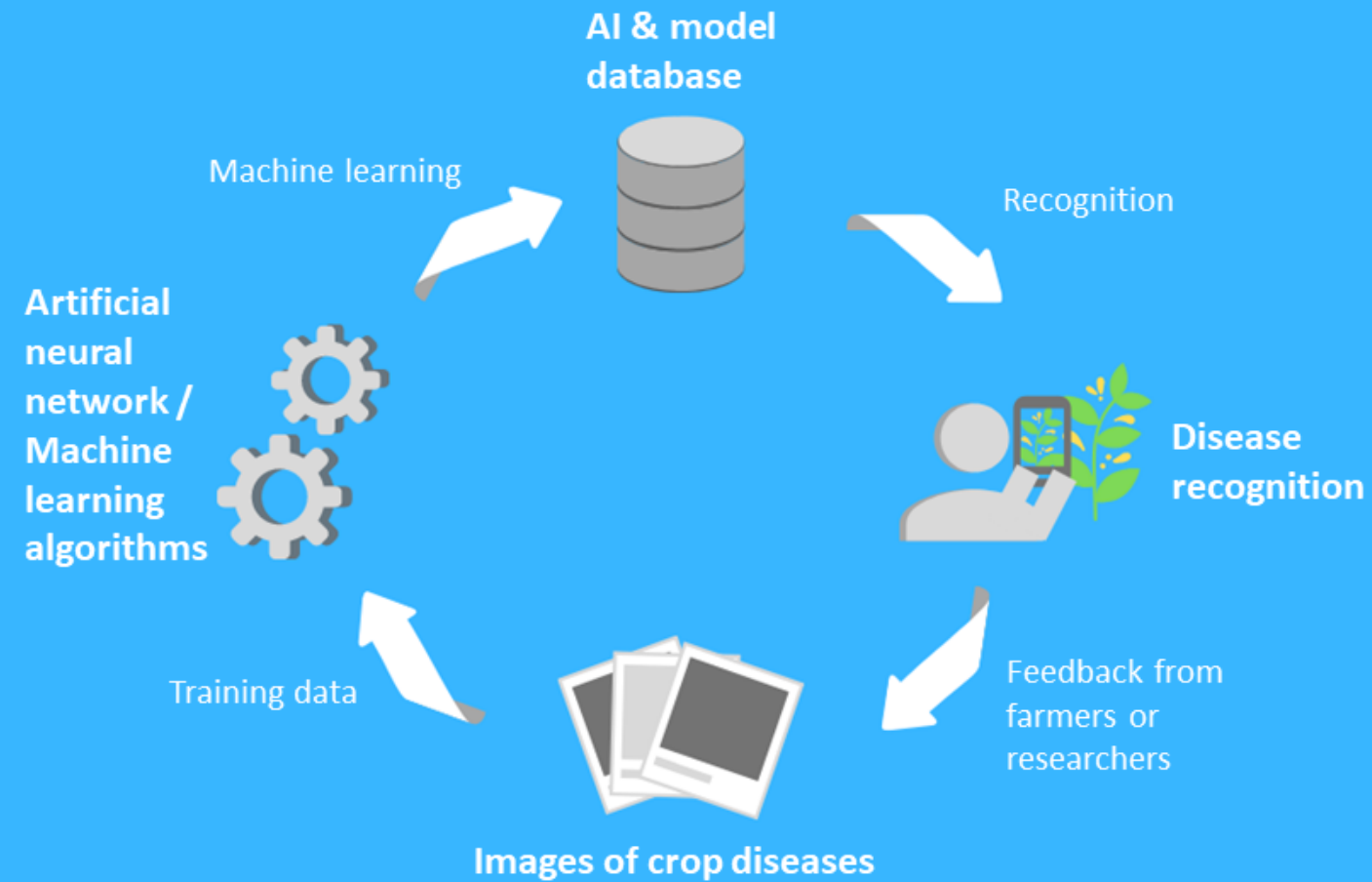Introduce a collaborative platform

Target Users

Farmers

Researchers / experts

Technical challenges

_____ Existing plant disease data is

not region invariant

_____ Data required for deep learning
task is large

_____ Data needs to be diverse in terms of capturing
condition, disease stages and image quality

Methodology

Prototype
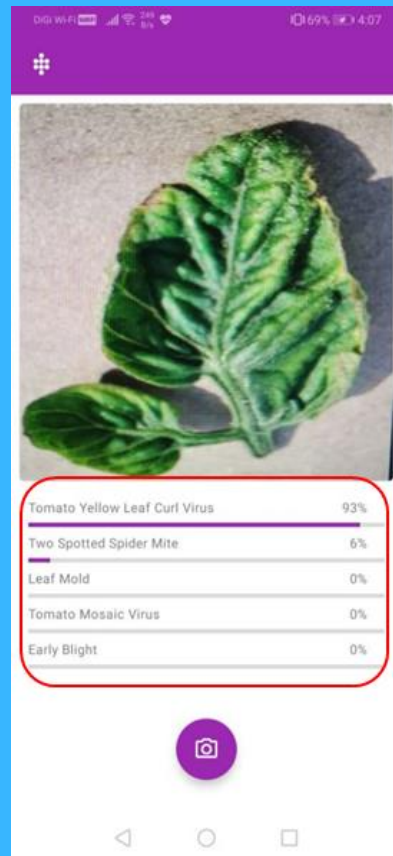

Automated tomato plant disease recognition system

Trained model results

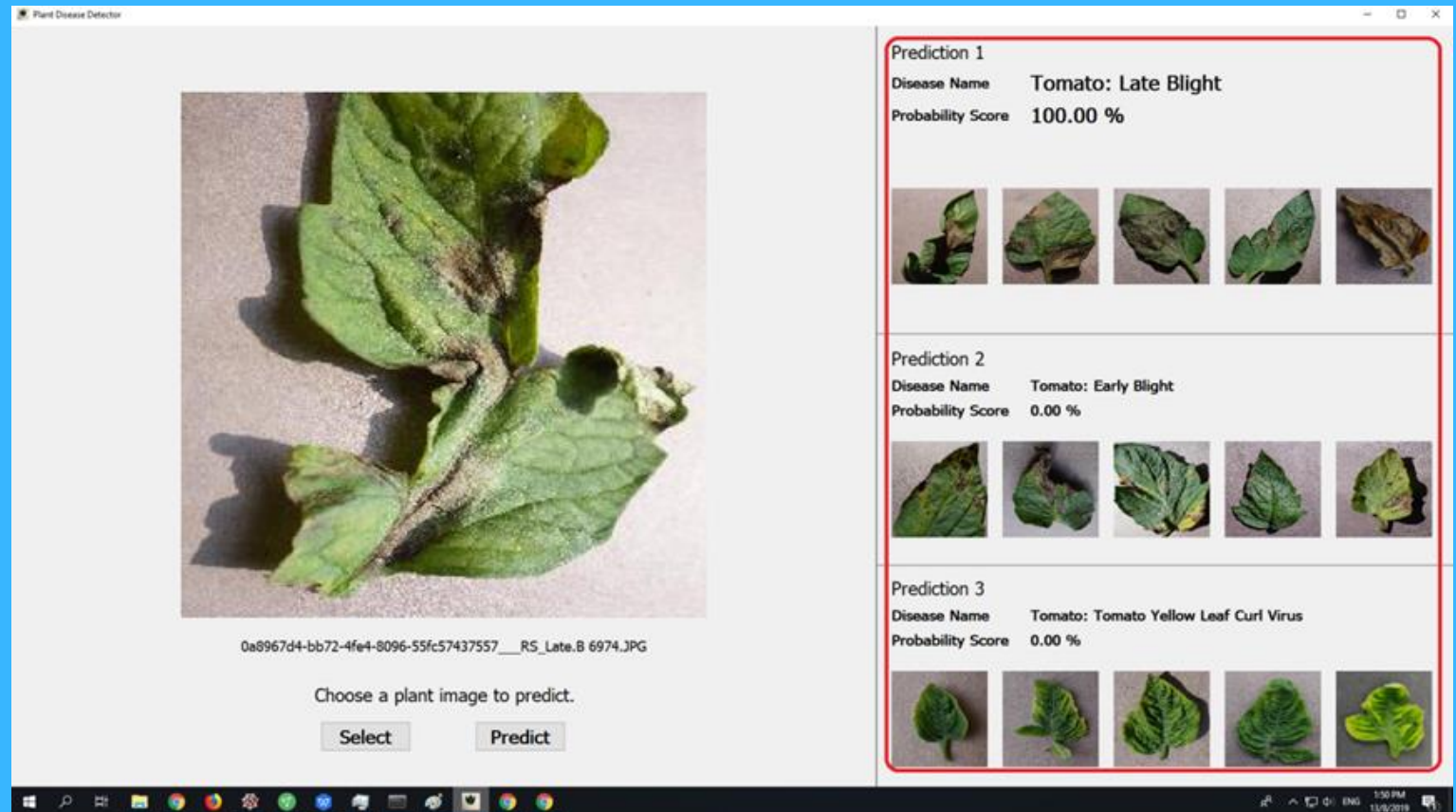| Accuracy	Model	
	1 (Mobile Net v2)	2 (Inception Resnet v2)
Training (Top 1)	88.13 %	96.88 %
Validation (Leaf Scan - Top 1)	97.94 %	99.75 %
Validation (Non-leaf Scan - Top 1)	64.44 %	78.89 %
Validation (Leaf Scan - Top 3)	99.92 %	100.00 %
Validation (Non-leaf Scan - Top 3)	93.33 %	91.11 %

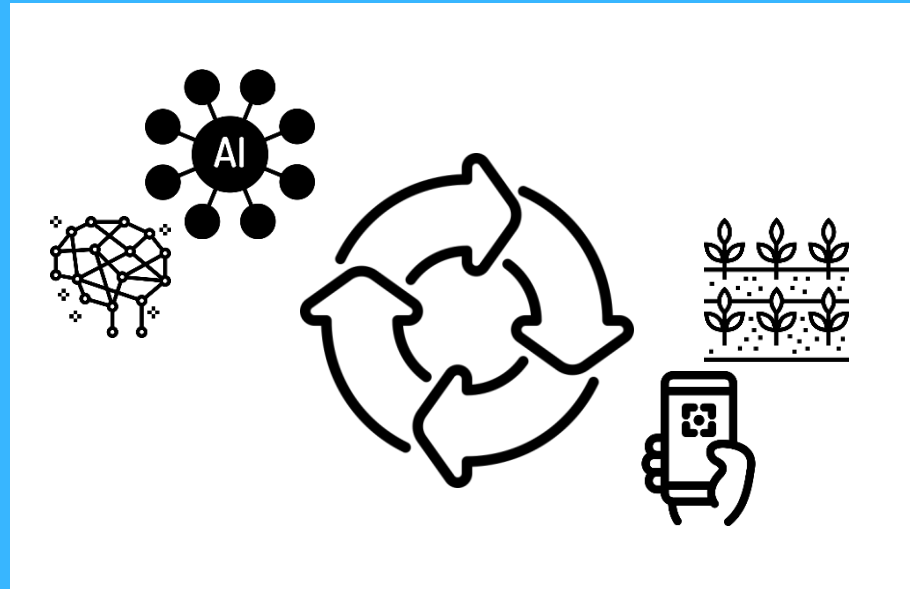# Prototype UI

Android app

Windows PC

Notable outcomes

- A reliable and continuously learning AI for crop disease
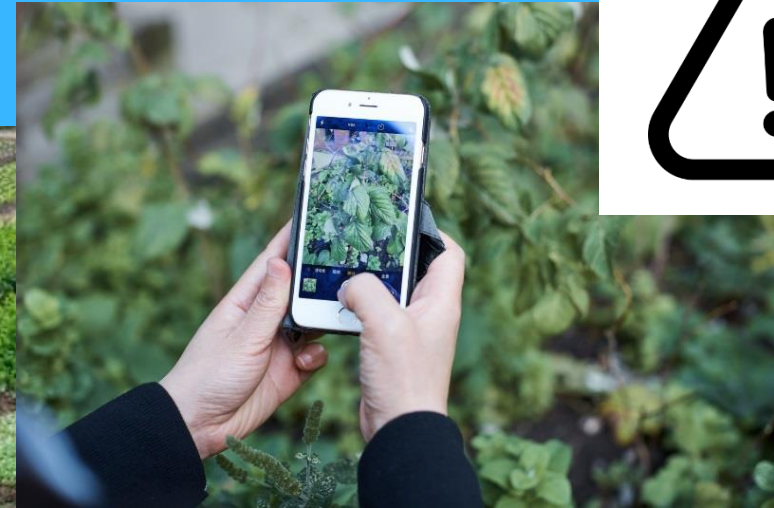
Notable outcomes

- Reduce the cost of data collection by crowdsourcing the community

Notable outcomes

- Early detection of crop disease to ensure quality yield at the same time maintain production quantity

Notable outcomes

- Detection and control of disease outbreak by related agricultural authority within the community
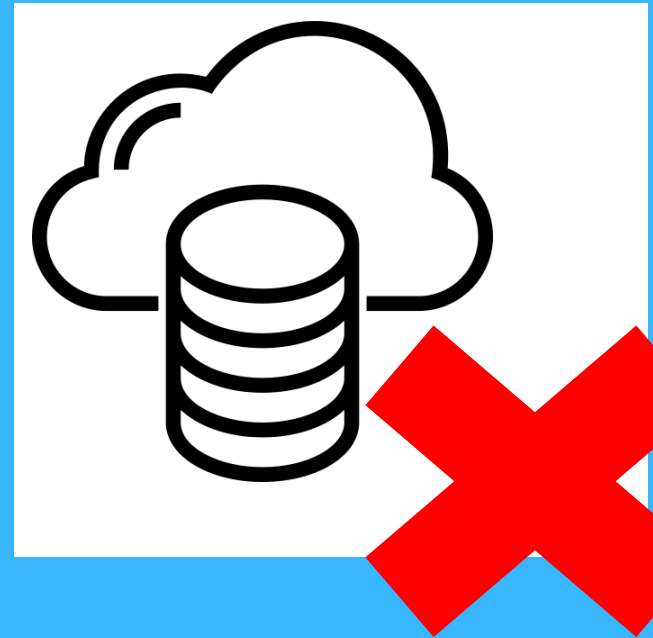

* Potential authorisation bodies

Notable outcomes

- Light-weight and independent AI model for offline disease detection

Conclusion

Sustain for research purposes & future generations

Increase quality yield

Reduce crop loss

Adopt timely response

Practical