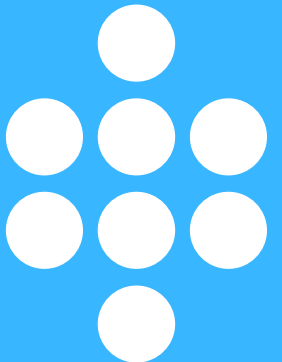




CropAI: AI Crop Disease Recognition System

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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

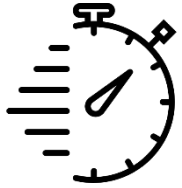


Machine



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

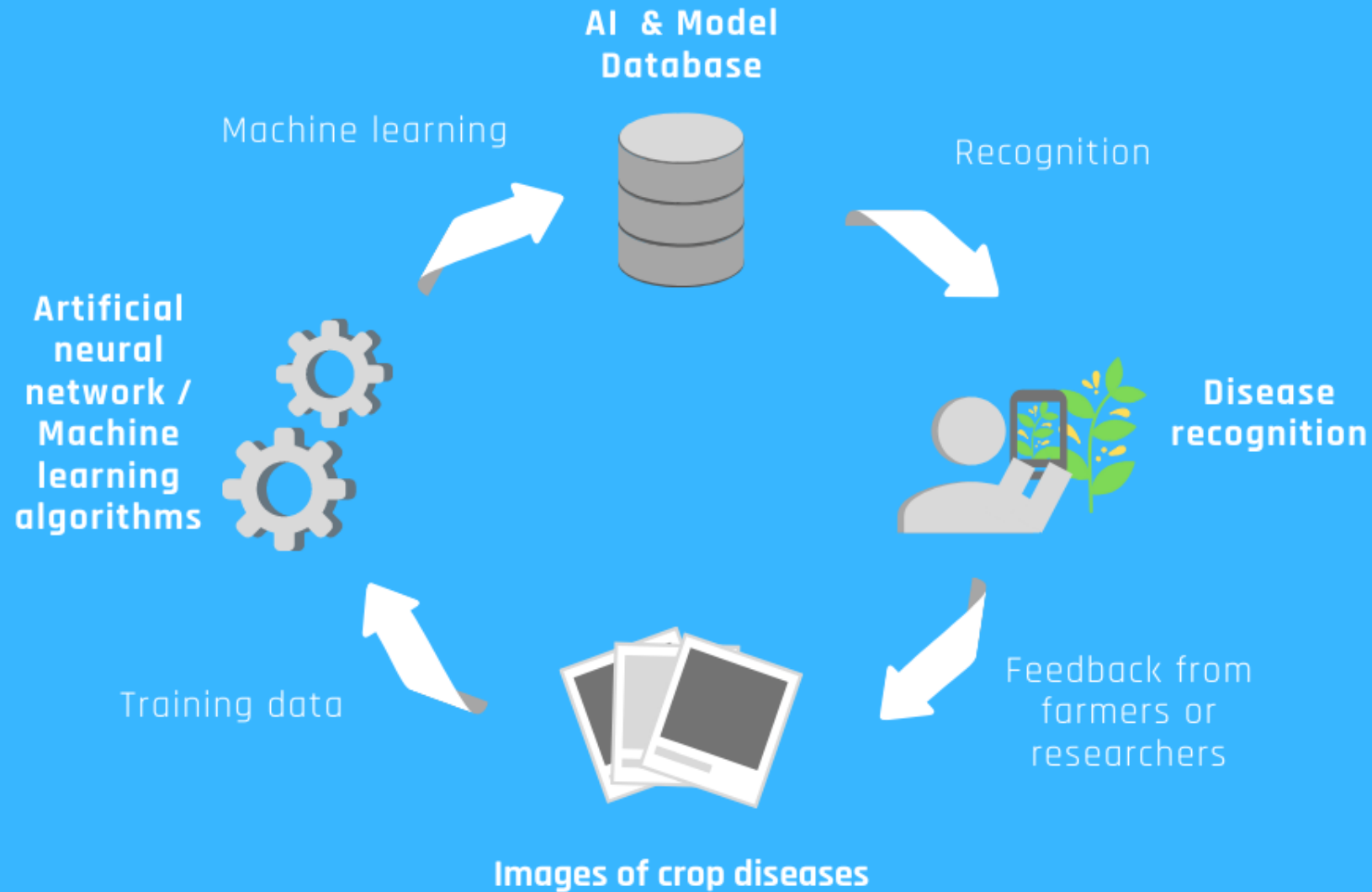


Researchers / experts

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 / Proof of concept



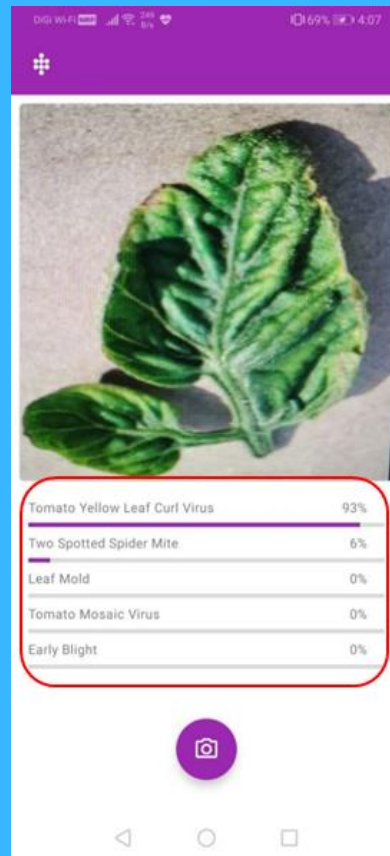
Automated tomato plant disease
recognition system

Trained model results

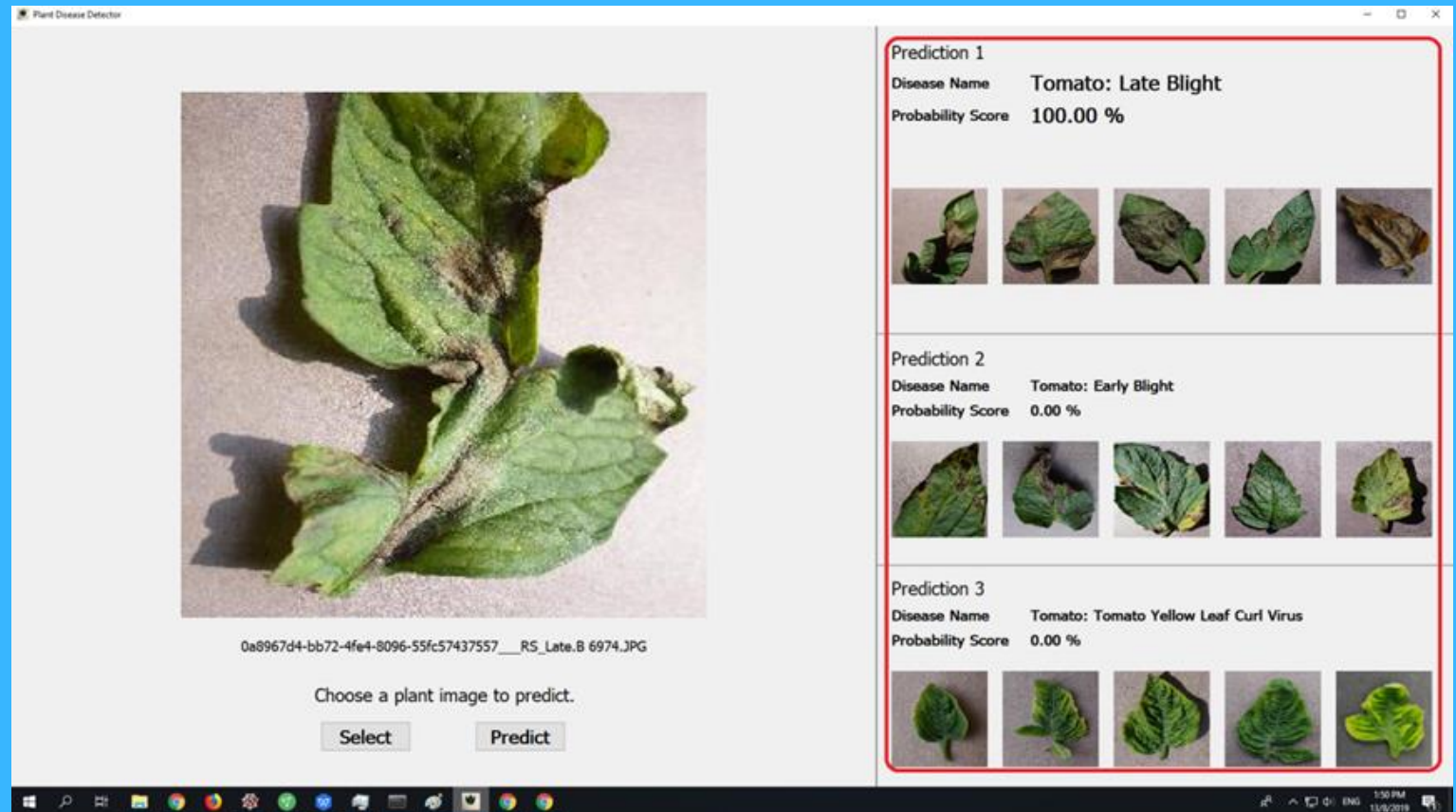
Accuracy	Model	
	1 (Mobile Net v2)	2 (Inception Resnet v2)
Training (Top 1)	88.13 %	96.88 %
Validation (Leaf Scan - Top 1)	97.94 %	99.75 %
Validation (Non-leaf Scan - Top 1)	64.44 %	78.89 %
Validation (Leaf Scan - Top 3)	99.92 %	100.00 %
Validation (Non-leaf Scan - Top 3)	93.33 %	91.11 %

Prototype UI

Android app



Windows PC



Notable outcomes

- A reliable and continuously learning AI for crop disease
- Reduce the cost of data collection by crowdsourcing the community
- Early detection of crop disease to ensure quality yield at the same time maintain production quantity
- Detection and control of disease outbreak by related agricultural authority within the community

Conclusion

Sustain for research purposes & future generations

Increase quality yield

Reduce crop loss

Adopt timely response

Practical

