

COMPUTER VISION FRAMEWORK FOR WHEAT DISEASE IDENTIFICATION AND CLASSIFICATION USING JETSON GPU INFRASTRUCTURE

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BY GHANA

Africa

01. PROBLEMS

Wheat rust diseases impact on food security in Ethiopia.

Multiple factors:

- Technology limitation
- Data processing limitation
- Precision Agriculture limitation

02. OBJECTIVE

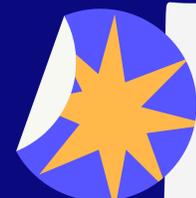
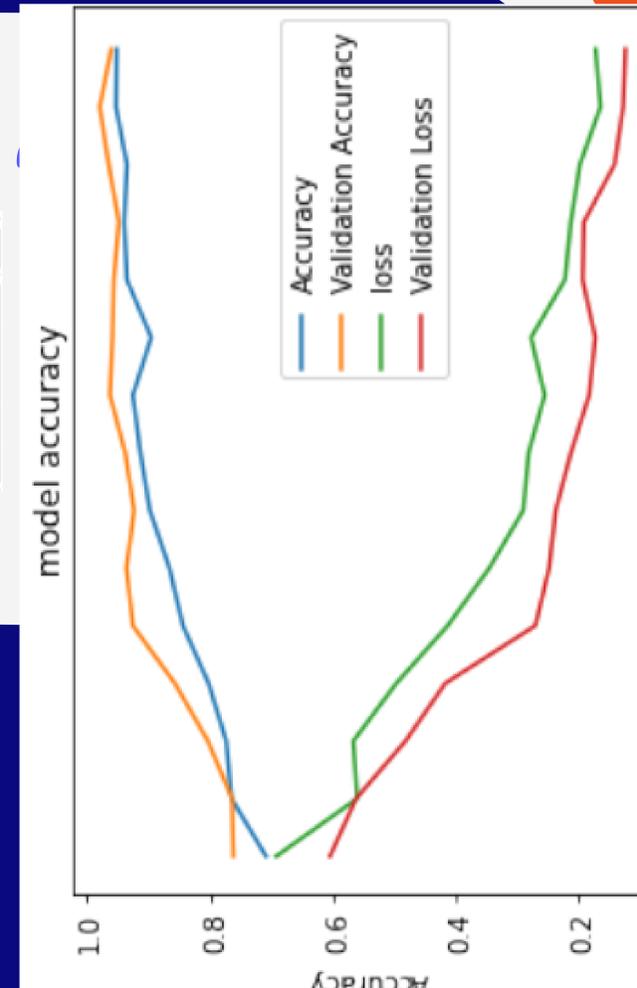
We proposed computer vision approach to detect and classify the types of wheat rust disease

05. ANALYSIS

From experimental results, VGG19 is a promising classifier that can handle image data in the plant disease classification domain.

DL models	Learnable para	Time	Epoch	on CPU	on GPU
Inception V3	153,603	1.30 hr	10	95.03%	
Inception v3	153,603	26 m	15	-	95.65%
Resnet50	301,059	2h:10m	50	-	81.57%
VGG16	75,267	29m	10	-	96.48%
VGG19	75,267	36m	15	-	99.38%

CLASSIFICATION PERFORMANCE OF EACH MODEL



Related Literature

We have reviewed a number of related works in domain area to assess research gaps and the attempts made by other researchers.

03. METHODOLOGY

We have followed experimental research approaches to realize the proposed study

- RGB image data were collected from Bishoftu area Surveys
- Data understanding and pre-processing
- Feature extraction and labelling rust types
- Training Inceptionv3, Resnet50, VGG16/19
- Model selection and Optimization

You can review the article from

04. RESULTS/FINDINGS

From the experiment results, VGG19 model classify the wheat disease with 99.38% accuracy

Tesla 84 GPU has been used to handle computational challenges

06. CONCLUSION

Computer vision plays significant roles in domain of precision agriculture.

Proposed system improve the efficiency of the crop-disease identification work, reduce biased decisions due to the manual system, and greatly reduce the time to process data.

We recommend young researcher to further explore the domain