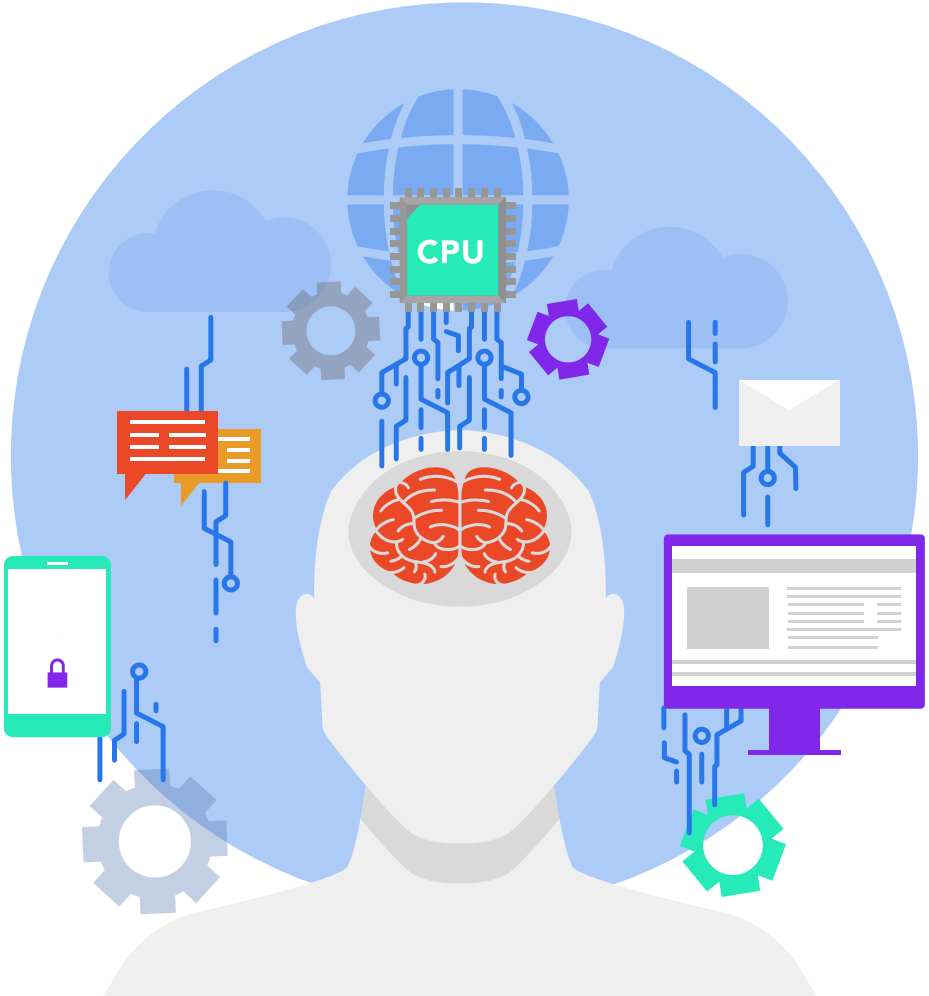


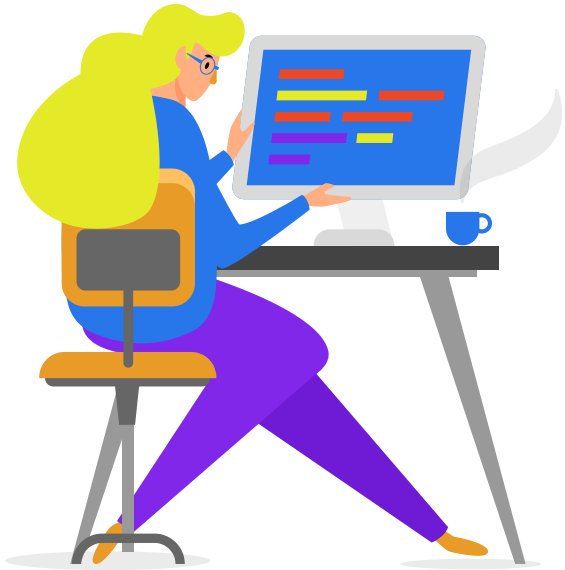
RipeVision.AI

Development of Tomato Maturity Level Prediction Software Using Advanced Artificial Intelligence Techniques

Sumedha Koranga : 54798
Under the Supervision of
Dr. N. C. Shahi

Contents

Introduction



01 **Importance of Maturity Level Detection**

02 **Indicators of Maturity Level**
Size and Color

03 **Human Inspection**
Error-prone and time-consuming

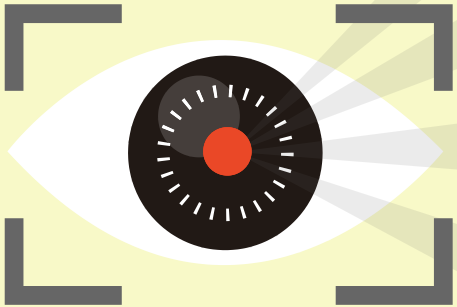
04 **Existing Methods**
Image Processing and specialized hardware

05 **Problems**
Expensive and inaccessible

06 **Suggested Solution**
Easy-to-use Android Application

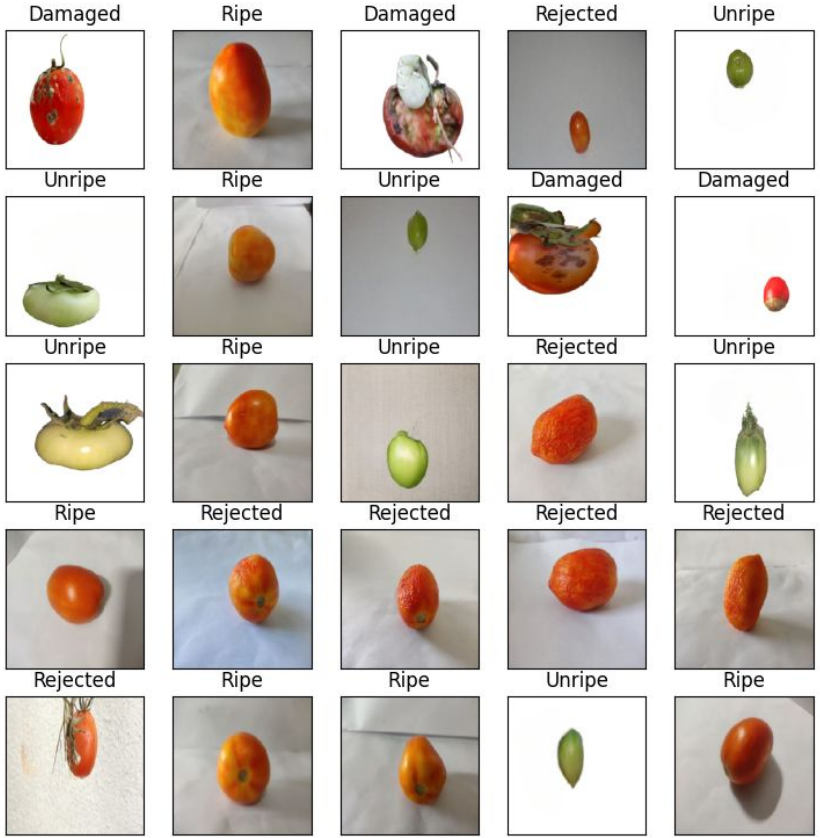
Review of Literature

Some existing approaches



- **Specialized Hardware** — Odor Sensors
- **Image Processing** — Distance between stem root and tomato height
- **Classical ML** — Logistic Regression and Support Vector Machine
- **Artificial Neural Networks** — Multi-layer perceptron

Dataset

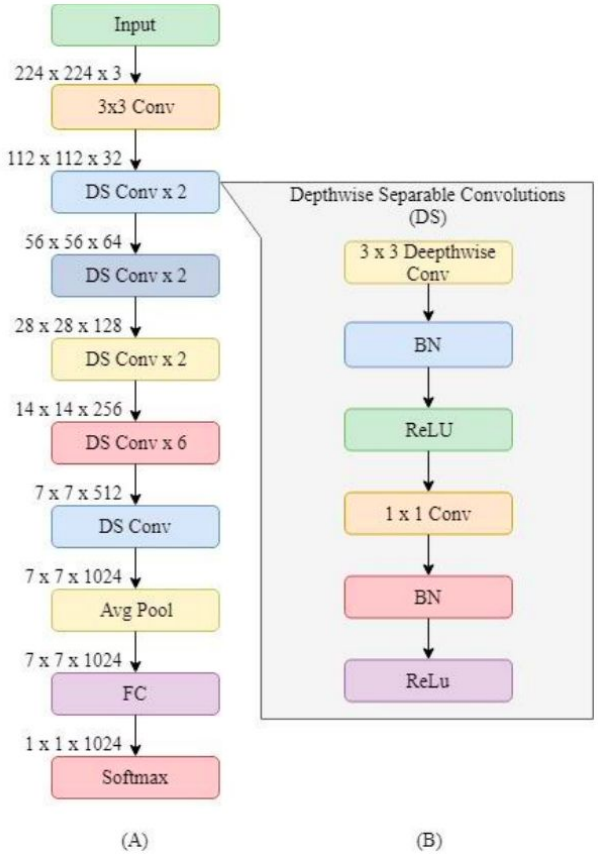


01 2,036 images

02 Four Classes: Unripe, Ripe, Rejected and Damaged

03 RGB Color Space

Transfer Learning using MobileNet



Data Augmentation

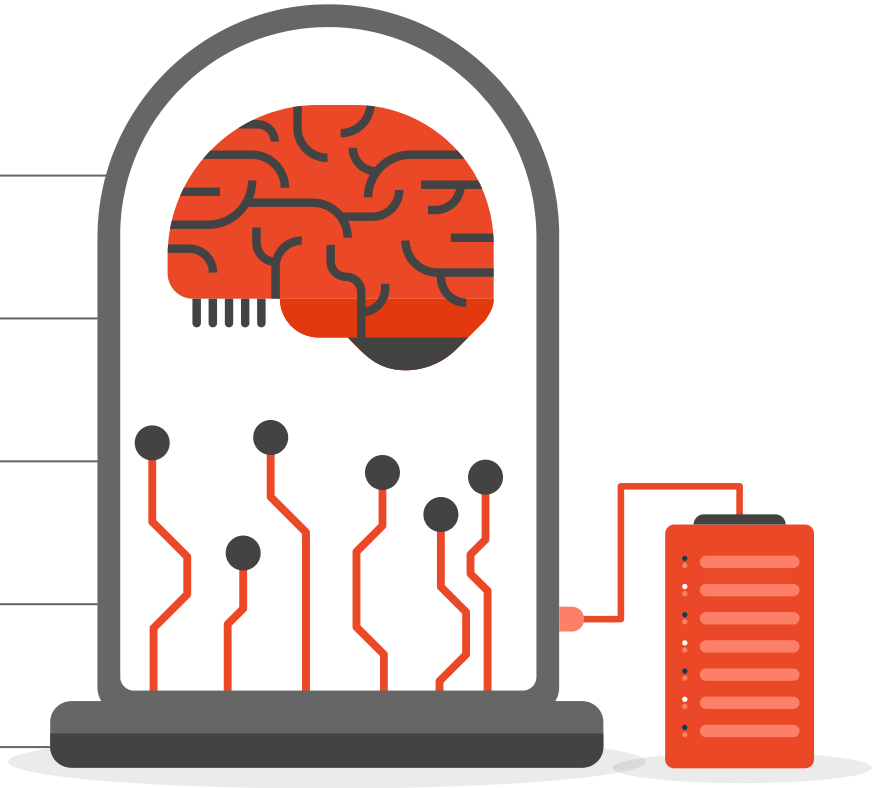
01 Horizontal and vertical shift augmentation

02 Horizontal and vertical flip augmentation

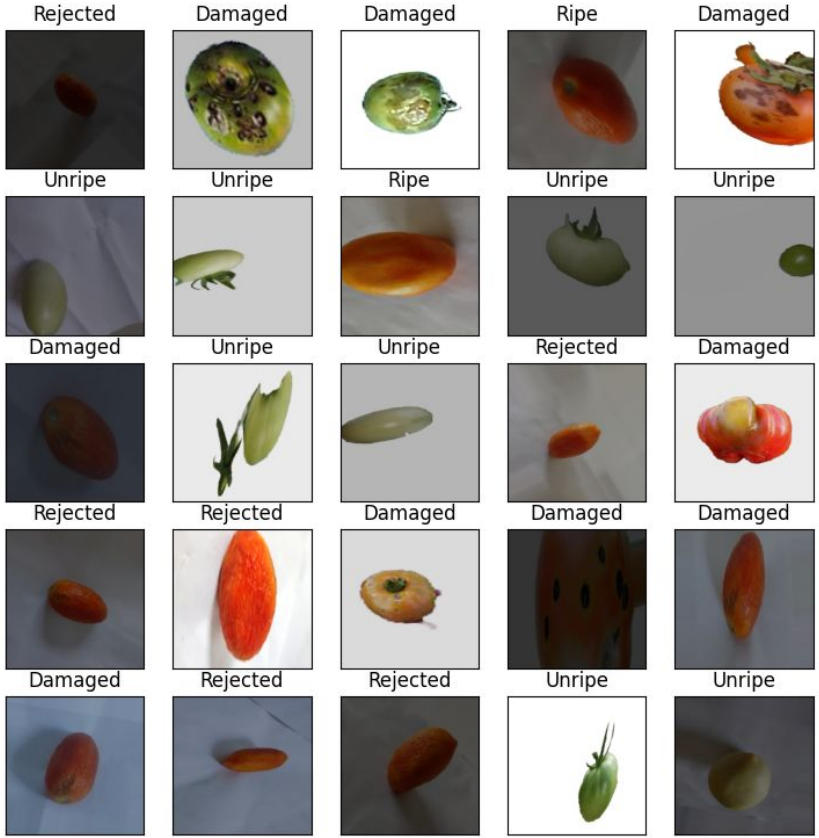
03 Random rotation augmentation

04 Random brightness augmentation

05 Random zoom augmentation



Data Augmentation - Light



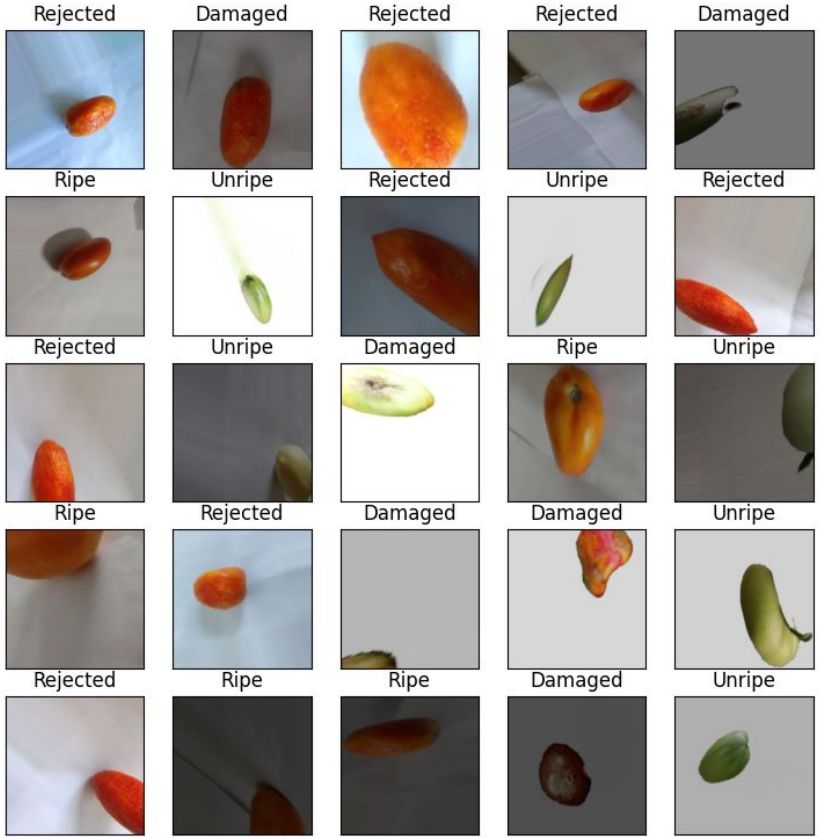
01 Rotation

02 Brightness

03 Zoom

04 Flip

Data Augmentation - Heavy



01 Rotation

02 Brightness

03 Zoom

04 Flip

05 Shift

06 Shear

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Models

01

Tomato Classifer

Deep Learning CNN model trained on original dataset

02

Tomato Classifer Pro

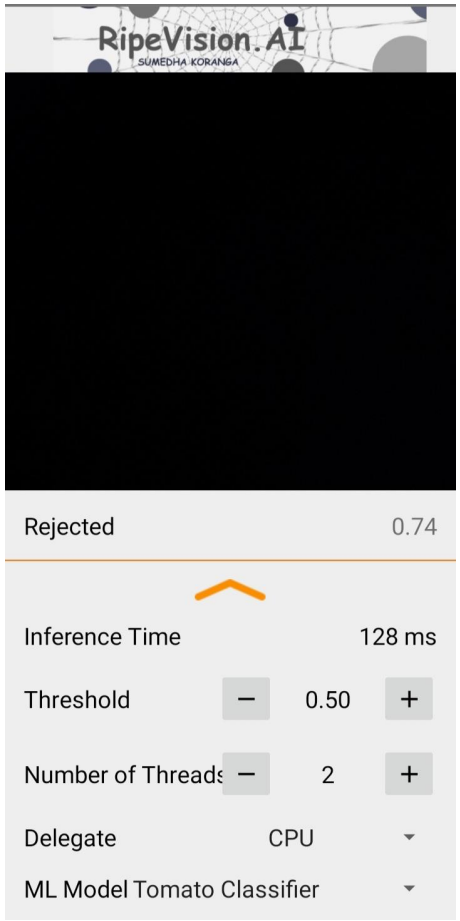
Deep Learning CNN trained on Light Data Augmentation dataset

03

Tomato Classifer Pro 2

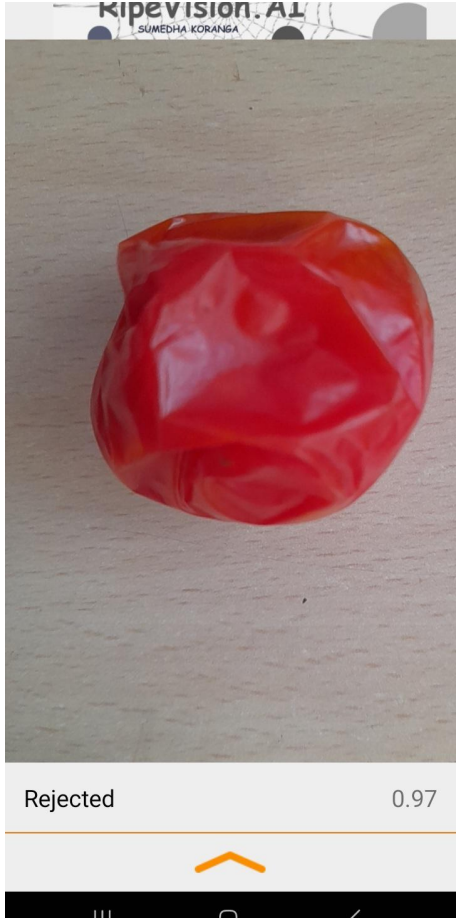
Deep Learning CNN trained on Heavy Data Augmentation dataset

Android Application Interface



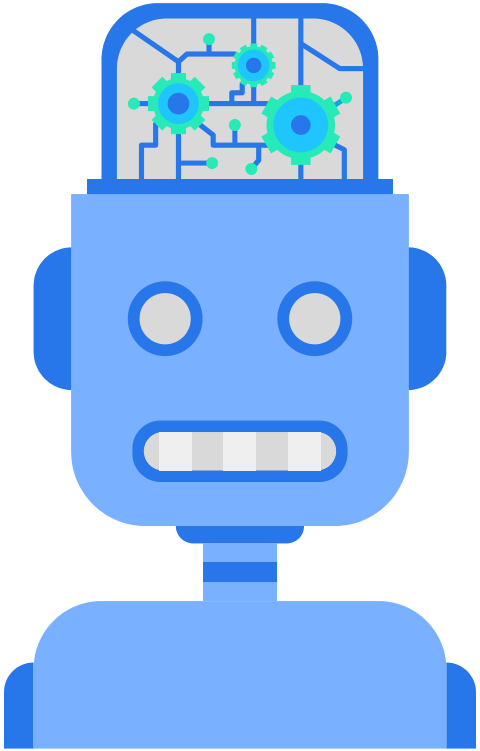
Android Application Performance

Android Application Performance



Android Application Performance

Conclusion



01

Prediction Quality

The prediction are highly accurate

02

Innovation

Light-weight model which can be run in any standard device

03

Trustworthy

Application indicate the model confidence level

04

Cost reduction

Application can be installed in any Android device

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Thank You!!!

Please ask any questions