CSNE | FOC | SLIIT

# EXPORT BEST QUALITY FRUITS

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## PINEAPPLE


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# AUTOMATED RIPENESS DETECTION SYSTEM

*Classifies **Pineapple Ripeness** from camera images for sorting.*

**Current Scope :**

- **YOLO model** for unripe, ripe, and overripe
- Uses labeled images and data augmentation
- Supports final sorting / accept-reject decisions

**Next step :**

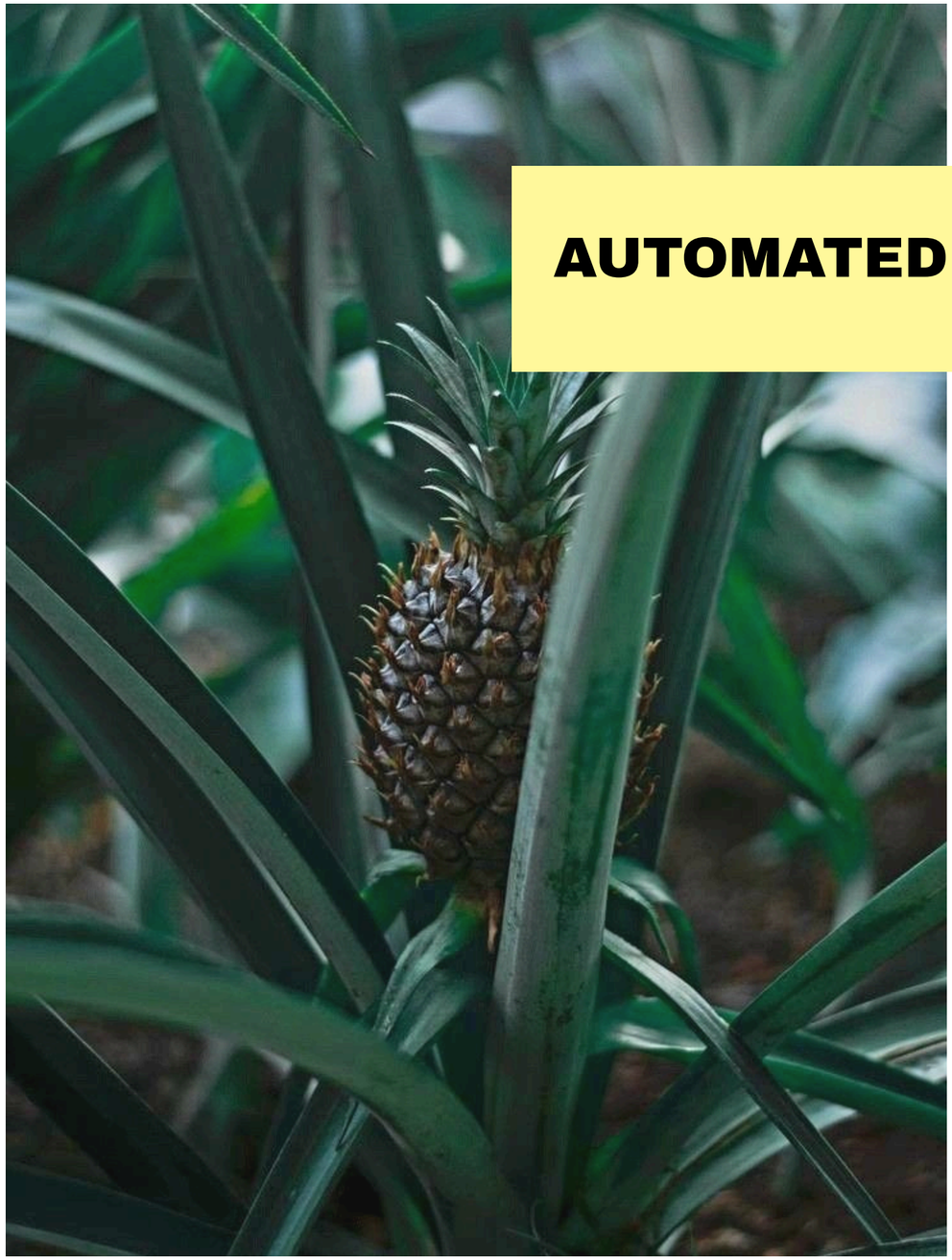
Improve performance in different lighting and difficult ripeness cases.

# PROGRESS

## PP1 (60%) → PP2

1. *Pineapple image dataset collected* ✓
2. *Images labeled as Unripe, Ripe, Overripe* ✓
3. *YOLO model architecture selected* ✓
4. *Image preprocessing and augmentation prepared* ✓

1. *Image Data set and Class Labled organized* ✓
2. *Model Training and Validation completed* ✓
3. *Intergrated with Python Interference Workflow* ✓
4. *Field Testing under more Light Conditions* 🕒



# AUTOMATED DEFECT DETECTION & QUALITY GRADING

Detects visible **Pineapple Defects** and assigns a **Quality Grade**.

**Current Scope :**

- YOLO model for black spots, holes, and white fungus
- Uses augmentation for better small defect detection
- Rule-based logic converts detections into a quality grade

**Next Step :**

Add more rare defect images to improve accuracy and grading consistency

# PROGRESS

## PP1 (60%) → PP2

1. *Defect classes defined (black spots, holes, fungus)* ✓
2. *Defect images collected and labeled* ✓
3. *YOLO defect detection model designed* ✓

1. *Defect Classes and Annotations defined* ✓
2. *Training Data Augmentation Pipeline prepared* ✓
3. *Grading Logic Implemented in backend* ✓
4. *More Defect samples for Edge cases* 🕒

# HARVEST PREDICTION

Estimates **Pineapple Yield** to support **Planning Decisions.**

**Current Scope :**

- Uses collected data such as color, weight, and height
- Prepared records for prediction and forecasting
- Converts sensor data into production insights

**Next Step :**

Add more rare defect images to improve accuracy and grading consistency.

# PROGRESS

## PP1 (60%) → PP2

1. *Prediction parameters defined (color, weight, size)* ✓
2. *Dataset structure prepared* ✓
3. *Prediction workflow designed* ✓

1. *Sensor measurements for key fruit features captured* ✓
2. *Data collection and reconstruction completed* ✓
3. *Prediction workflow concept prepared* ✓
4. *Season-scale model refinement still needed* 🕒

# IOT INTEGRATION AND IMPLEMENTATION

Connects **Sensors, Control, Vision,** and the **User Interface** into one system.

**Current Scope :**

- ESP32 controls sensors, conveyor motion, and system flow
- MQTT transfers data and images between devices
- UI supports system monitoring and interaction

**Next Step :**
Perform longer tests to improve communication and timing stability

# PROGRESS

## PP1 (60%)

1. *Data collection completed* ✓
2. *Sensor measurements recorded* ✓
3. *Initial prediction workflow prepared* ✓

## PP2

1. *ESP32 firmware and sequence flow implemented* ✓
2. *MQTT communication path established* ✓
3. *UI and front-end implementation completed* ✓
4. *Full end-to-end reliability tuning* 🕒

# THANK YOU !