

New Release

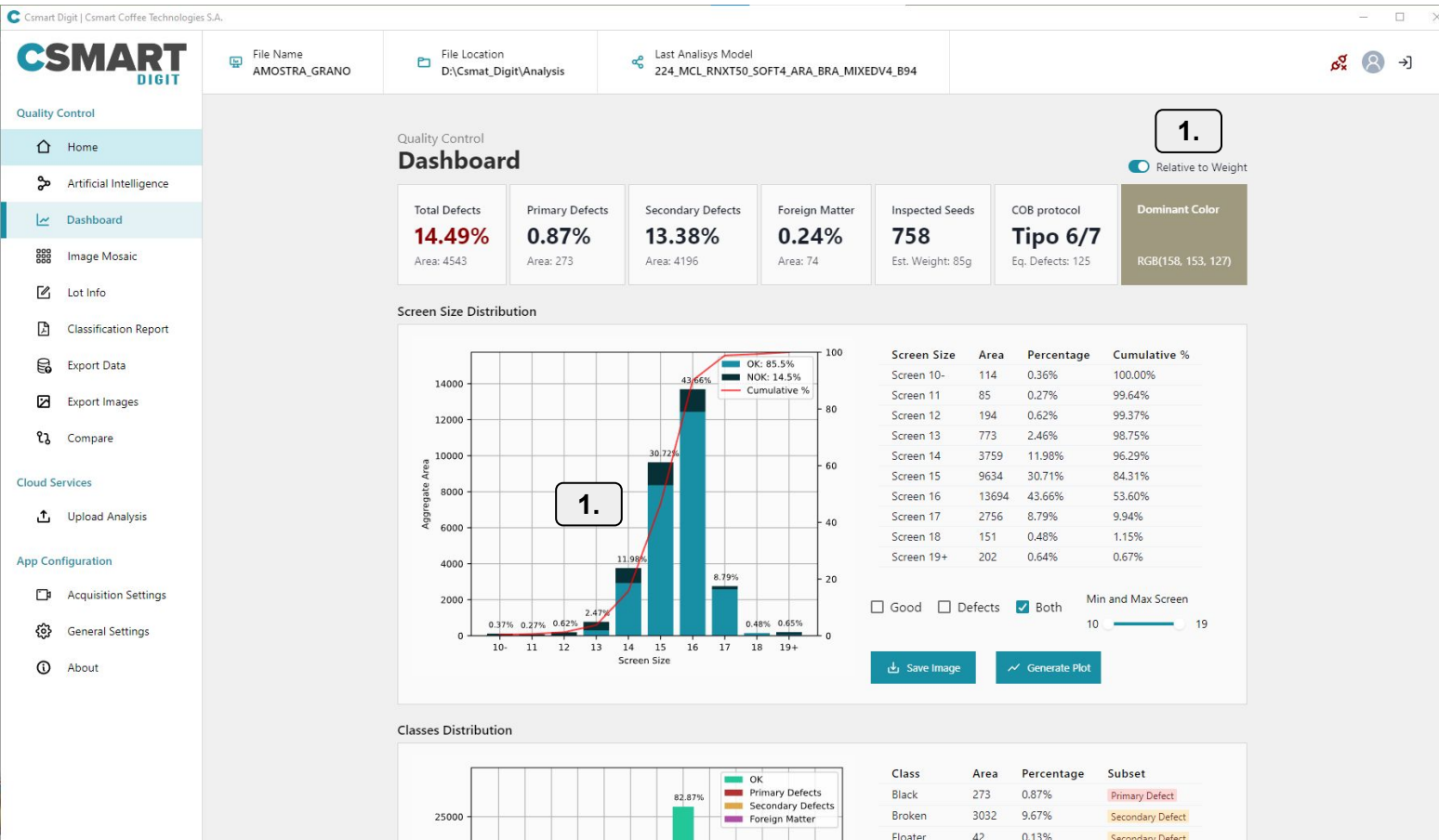
Device Control Desktop App

Minor version - V3.0.10

2024/07/19

Dashboard

1. A new switch labeled **Relative to Weight** and **Relative to Count** can be selected to change all calculations regarding screen size distribution. When **Relative to Count** is selected, all graphs and tables reflect the occurrence of each seed relative to the total occurrence. Conversely, when **Relative to Weight** is selected, the percentage is calculated based on the area of each seed relative to the total area of the sample, which strongly correlates to weight. This is a global variable, meaning any change here will affect all screens in the software.



Dashboard

File Name
AMOSTRA_GRANO

File Location
D:\Csmat_Digit\Analysis

Last Analysis Model
224_MCL_RNXT50_SOFT4_ARA_BRA_MIXEDV4_B94



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☒ Relative to Weight

Total Defects

14.49%

Area: 4543

Primary Defects

0.87%

Area: 273

Secondary Defects

13.38%

Area: 4196

Foreign Matter

0.24%

Area: 74

Inspected Seeds

758

Est. Weight: 85g

COB protocol

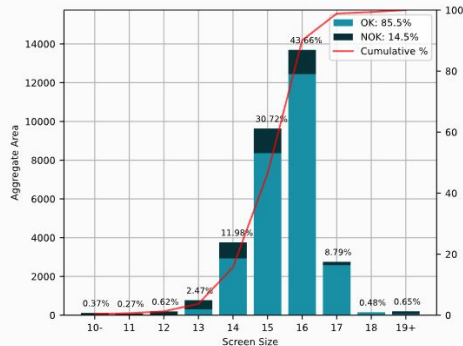
Tipo 6/7

Eq. Defects: 125

Dominant Color

RGB(158, 153, 127)

Screen Size Distribution



| Screen Size | Area | Percentage | Cumulative % |
|-------------|-------|------------|--------------|
| Screen 10- | 114 | 0.36% | 100.00% |
| Screen 11 | 85 | 0.27% | 99.64% |
| Screen 12 | 194 | 0.62% | 99.37% |
| Screen 13 | 773 | 2.46% | 98.75% |
| Screen 14 | 3759 | 11.98% | 96.29% |
| Screen 15 | 9634 | 30.71% | 84.31% |
| Screen 16 | 13694 | 43.66% | 53.60% |
| Screen 17 | 2756 | 8.79% | 9.94% |
| Screen 18 | 151 | 0.48% | 1.15% |
| Screen 19+ | 202 | 0.64% | 0.67% |

☐ Good ☐ Defects ☒ Both

Min and Max Screen

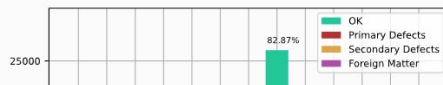
10 19

Save Image

Generate Plot

3.

Classes Distribution



| Class | Area | Percentage | Subset |
|---------|------|------------|------------------|
| Black | 273 | 0.87% | Primary Defect |
| Broken | 3032 | 9.67% | Secondary Defect |
| Floater | 42 | 0.13% | Secondary Defect |

2. The **Min and Max Screen** slider is intended to define the boundaries of the screen size distribution. Changing the values will adjust any sizes that are larger or smaller than the specified limits to the selected boundaries.

3. After selecting the min and max values, click **Generate Plot** to calculate and generate both the Screen Size plot and table

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0.24%

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Inspected Seeds

758

Est. Weight: 85g

COB protocol

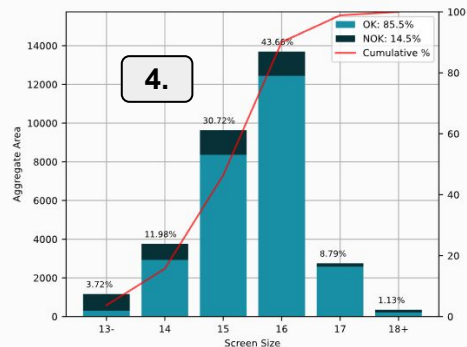
Tipo 6/7

Eq. Defects: 125

Dominant Color

RGB(158, 153, 127)

Screen Size Distribution



| Screen Size | Area | Percentage | Cumulative % |
|-------------|-------|------------|--------------|
| Screen 13- | 1168 | 3.72% | 100.00% |
| Screen 14 | 3759 | 11.98% | 96.28% |
| Screen 15 | 9634 | 30.71% | 84.30% |
| Screen 16 | 13694 | 43.66% | 53.59% |
| Screen 17 | 2756 | 8.79% | 9.93% |
| Screen 18+ | 354 | 1.13% | 1.14% |

☐ Good ☐ Defects ☒ Both Min and Max Screen
13 18

Save Image

Generate Plot

4.

Classes Distribution



| Class | Area | Percentage | Subset |
|---------|------|------------|------------------|
| Black | 273 | 0.87% | Primary Defect |
| Broken | 3032 | 9.67% | Secondary Defect |
| Floater | 42 | 0.13% | Secondary Defect |

Dashboard

4. Example of the adjusted plot and table, limited to screens 13 and 18.

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5.

☒ Relative to Weight

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0.24%

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Inspected Seeds

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Est. Weight: 85g

COB protocol

Tipo 6/7

Eq. Defects: 125

Dominant Color

RGB(158, 153, 127)

Screen Size Distribution

Expected Screen Size Distribution

| Screen Size | Expected Count (300g) |
|--------------------|-----------------------|
| Screen 10 and less | 3738 seeds |
| Screen 11 | 3524 seeds |
| Screen 12 | 3309 seeds |
| Screen 13 | 2970 seeds |
| Screen 14 | 2910 seeds |
| Screen 15 | 2775 seeds |
| Screen 16 | 2535 seeds |
| Screen 17 | 2235 seeds |
| Screen 18 and more | 1920 seeds |

Close

Dashboard

5. Weight estimation now takes into account the expected screen size distribution over a known weight. This information is associated with the AI model file, allowing each AI model to have a different distribution. Users need to create this table for their models. Based on the expected count distribution and the total seeds inspected, it is possible to estimate the weight of the analyzed sample. Note that it is not possible to assume that every seed that passes through the conveyor will be recorded, so the expected distribution serves as the baseline variable for accurate classification methods

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Classification Methods

Total Defects

115

Weight Factor: 3.53

| Method | Equivalent Defects | Type |
|--------|--------------------|----------|
| COB | 125 | Tipo 6/7 |
| NY | 125 | NY 6 |

COB

NY

7.

| Class | Original Count | Weighted Count | Factor | Equivalent Defects |
|--------------|----------------|----------------|--------|--------------------|
| Black | 7 | 25 | 1 to 1 | 25 |
| Broken | 79 | 279 | 5 to 1 | 56 |
| Floater | 1 | 4 | 5 to 1 | 1 |
| Fox Bean | 19 | 68 | 0 | 0 |
| Husk Small | 0 | 0 | 3 to 1 | 0 |
| Husk Medium | 0 | 0 | 3 to 1 | 0 |
| Husk Large | 0 | 0 | 1 to 1 | 0 |
| Immature | 6 | 22 | 5 to 1 | 5 |
| Insect Dam. | 10 | 36 | 5 to 1 | 8 |
| Ok | 624 | 2203 | 0 | 0 |
| Parchment | 2 | 8 | 2 to 1 | 4 |
| Pod | 0 | 0 | 1 to 1 | 0 |
| Rocks Small | 0 | 0 | 3 to 1 | 0 |
| Rocks Medium | 2 | 8 | 1 to 2 | 16 |
| Rocks Large | 0 | 0 | 1 to 5 | 0 |
| Shell | 8 | 29 | 3 to 1 | 10 |
| Sour | 0 | 0 | 2 to 1 | 0 |

AI Parameters

Prediction Entropy

Average Entropy 0.78%

Confidence Level High Confidence

True Positives

112

Ratio: 14.78%

True Negatives

643

Ratio: 84.83%

False Positives

0

Ratio: 0.0%

False Negatives

3

Ratio: 0.4%

Dashboard

6. Based on the **Estimated Weight** and the **Required Weight** of the classification method, a **Weight Factor** is applied.

7. All occurrences of each defect will be multiplied by the **Weight Factor**, generating a **Weighted Count**. From that, the class factor, defined by the chosen method, is applied to determine the **Equivalent defects** per class and Total.

8. This procedure is applied to all methods present in the AI model and can be accessed in the tabs view.

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Non Defective Seeds

OK Classes

643 Seeds | 85.51%

Dominant Color

RGB(158, 153, 127)



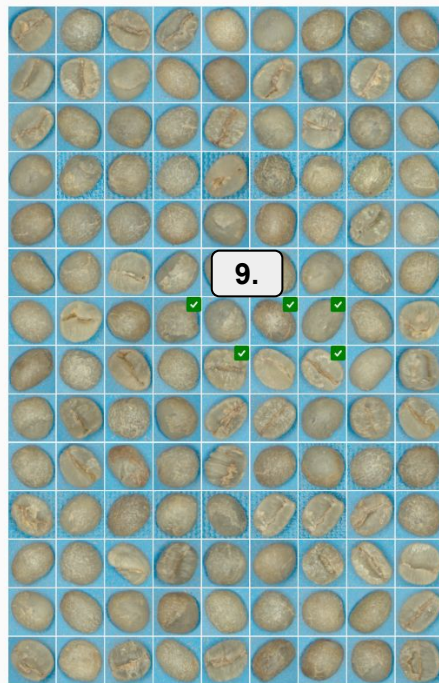
Color by Class



Draw Perimeter



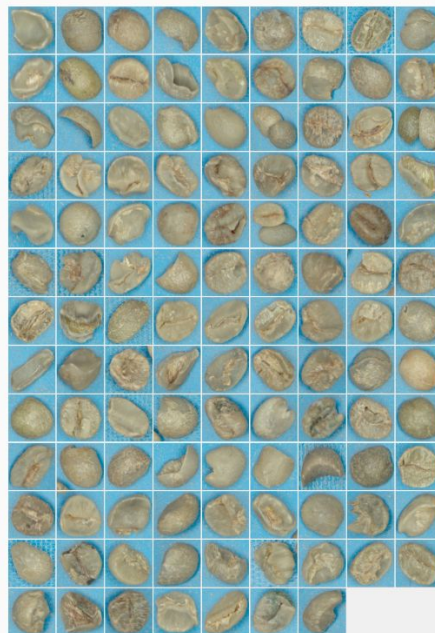
Draw Min Axis



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Edit Selection

10.



Defective Seeds

NOK Classes

115 Seeds | 14.49%

Dominant Color

RGB(158, 153, 126)



Color by Class



Draw Perimeter



Draw Min Axis

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Clear Selection

11.

Image Mosaic

9. By pressing **CTRL** and clicking on the grid cells, it is possible to select multiple images at once. A green check mark is shown on each selected seed.

10. By pressing **Edit Selection**, a side menu will open, allowing the user to change the class of all selected images at once.

11. To reset the selection, the user can click the **Clear Selection** button.

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Non Defective Seeds

OK Classes

643 Seeds | 85.51%

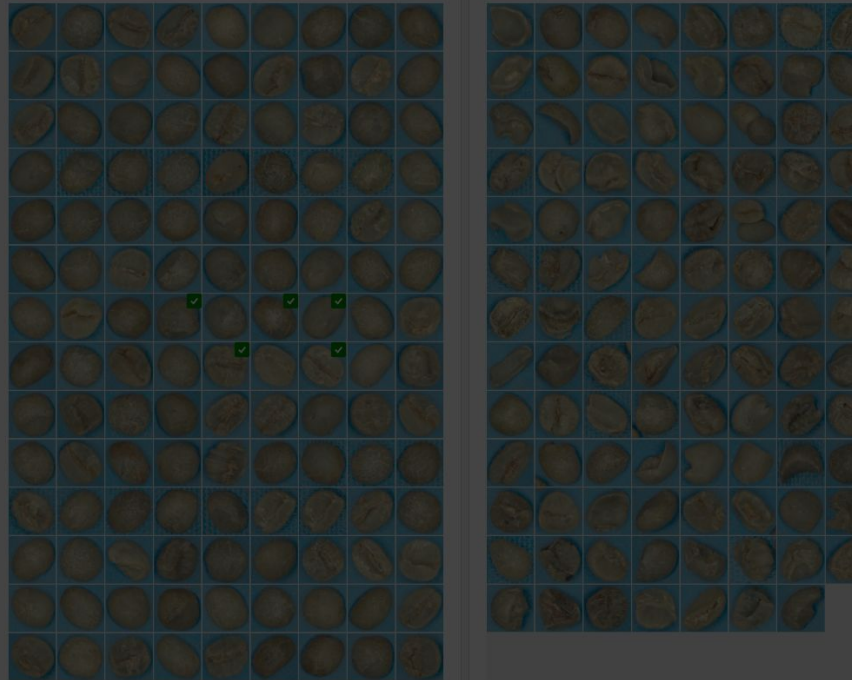
Dominant Color

RGB(158, 153, 127)

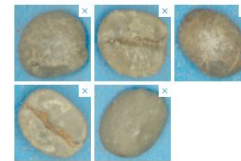
- ☐ Color by Class
- ☐ Draw Perimeter
- ☐ Draw Min Axis

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Edit Selection



Seed Features



Classification

Select class

12.

Image Mosaic

12. Use the select menu to assign a new class to the selected images

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Classification Report

1. Select the report language:

English

2. Specify if the percentage refers to count or weight:

☒ Relative to Weight

3. Specify the 'Screen Distribution' mode:

☐ Only Good ☐ Only Defects ☒ Both

4. Specify the minimum and maximum screen sizes:

13 18

5. Select detailed classification methods to include:

☒ COB ☒ NY

6. Select extra features:

- ☒ Screen Sizes Plot and Classes Distribution Plot
- ☒ Sample images of Good and Defective Coffees
- ☐ Correlations Plots
- ☐ Artificial Intelligence Metrics
- ☐ Descriptive Statistics

7. Click 'Generate PDF' to export the report:

Generate PDF

Open Pdf after Export ☒

Classification Report

13. The classification report incorporates changes in screen distribution, allowing it to be represented as relative to weight or relative to count.

14. The Screen Distribution mode can be selected to include only good coffee, only defective coffee, or both, in regards to tables and plots.

15. The user can specify limits for screen size, adapting the data accordingly.

16. A new selection allows specifying the method to be included in the report

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Export Images

1. Please select the image export mode:

- ☒ Export all classes (Classification results)
- ☐ Export as a single class (Dataset creation)
- ☐ Export corrected images only (Model improvement)

2. Click 'Export Images' to save individual images

Export Images

- ☒ Open folder after saving

17.

Classification Report

13 Export Images is now divided into three different modes:

Export All Classes:

Saves a new folder for each class, containing the respective images inside.

Export as a Single

Class: Saves all images into a single folder and is intended to create training datasets, particularly in cases where the input sample is previously known to be a single class, regardless of the actual classification.

Export Corrected

Images: Only exports images that were changed in class by the user.



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