

Nova Versão  
**Aplicativo  
desktop**

Versionamento menor - V3.0.12

16/08/2024

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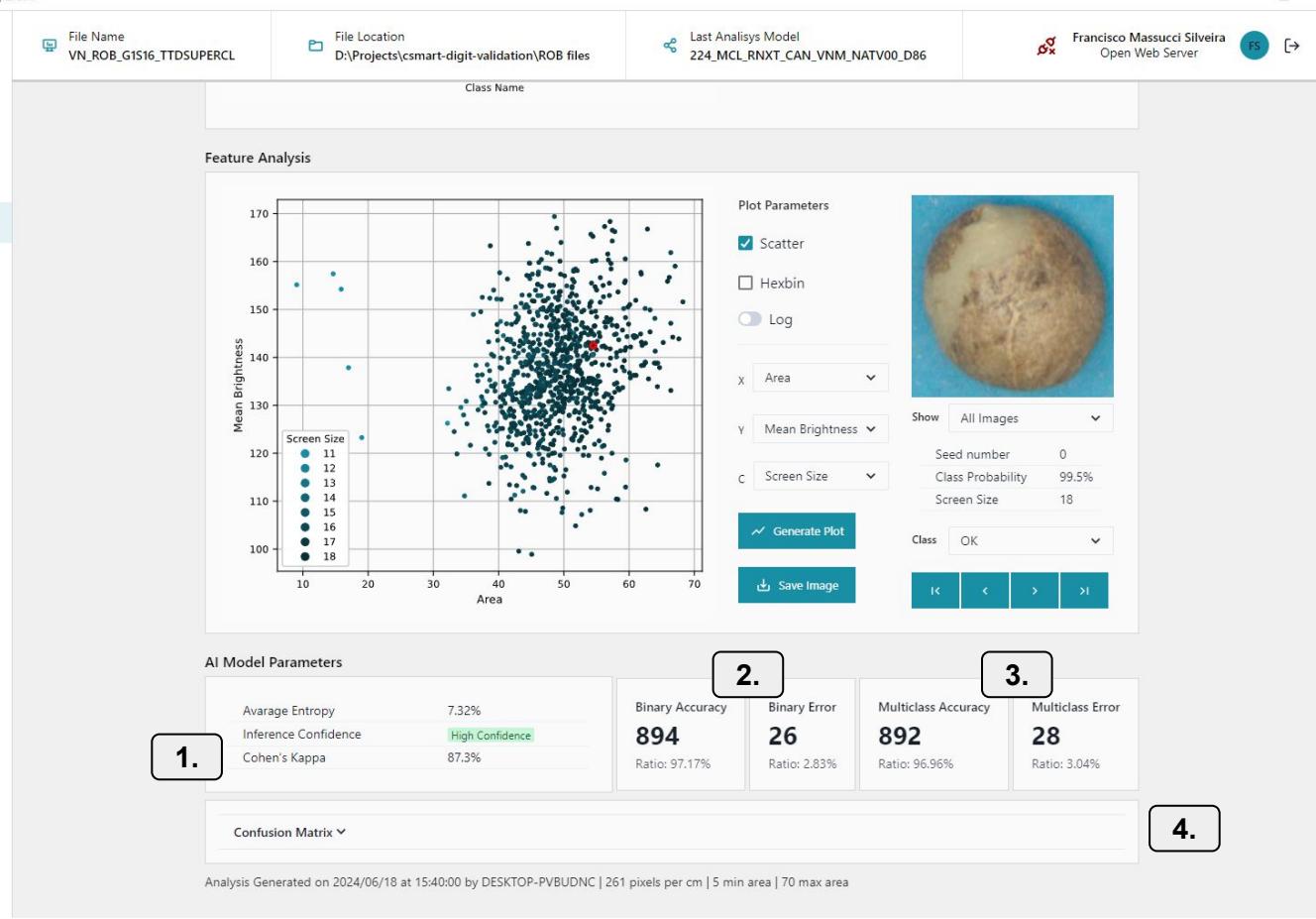
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**Dashboard**

1. Parâmetros do Modelo de IA agora apresentam mais recursos:

**Cohen's Kappa** mede o quanto bem dois sistemas concordam ao classificar — neste caso, o modelo de IA e a análise humana (verdadeiro). Este sistema considera ainda que algumas concordâncias podem ocorrer por acaso. Uma pontuação próxima de 0 indica total desacordo, enquanto 100% mostra que as previsões do modelo de IA estão perfeitamente alinhadas com o julgamento humano. Essa métrica se torna relevante após o usuário ter ajustado a classificação das imagens no mosaico de imagens.

# Dashboard

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File Name: VN\_ROB\_G1S16\_TTDSUPERCL

File Location: D:\Projects\csmart-digit-validation\ROB files

Last Analisis Model: 224\_MCL\_RNXT\_CAN\_VNM\_NATV00\_D86

Francisco Massucci Silveira  
Open Web Server

### Feature Analysis

Scatter Plot showing Mean Brightness vs Area. A legend indicates Screen Size values from 11 to 18. A red dot highlights a specific data point.

Plot Parameters:

- Scatter
- Hexbin
- Log

X: Area, Y: Mean Brightness, C: Screen Size

Show: All Images, Seed number: 0, Class Probability: 99.5%, Screen Size: 18

Generate Plot, Save Image

### AI Model Parameters

1. Model Evaluation parameters:

Avarage Entropy: 7.32%	Inference Confidence: High Confidence
Cohen's Kappa: 87.3%	

2. Binary Performance:

Binary Accuracy: 894	Binary Error: 26
Ratio: 97.17%	Ratio: 2.83%

3. Multiclass Performance:

Multiclass Accuracy: 892	Multiclass Error: 28
Ratio: 96.96%	Ratio: 3.04%

4. Confusion Matrix:

Analysis Generated on 2024/06/18 at 15:40:00 by DESKTOP-PVBUDNC | 261 pixels per cm | 5 min area | 70 max area

2. **Binary Accuracy e Binary Error** são usadas para avaliar o desempenho de um modelo de IA ao diferenciar entre café bom e café defeituoso. A Acurácia Binária calcula a porcentagem de previsões corretas para as classes defeituosas em relação a todas as previsões, enquanto o Erro Binário representa a porcentagem de previsões incorretas. Essas métricas são cruciais para entender quão bem o modelo distingue entre cafés bons e defeituosos, desconsiderando erros dentro desses subconjuntos.

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**File Name:** VN\_ROB\_G1S16\_TTDSUPERCL    **File Location:** D:\Projects\csmart-digit-validation\ROB files    **Last Analisis Model:** 224\_MCL\_RNXT\_CAN\_VNM\_NATV00\_D86    **User:** Francisco Massucci Silveira    **OS:** Open Web Server

### Feature Analysis

**Plot Parameters:**

- Scatter
- Hexbin
- Log

X: Area   Y: Mean Brightness   C: Screen Size

Show: All Images   Seed number: 0   Class Probability: 99.5%   Screen Size: 18

Generate Plot   Save Image

### AI Model Parameters

1.	2.	3.
Average Entropy: 7.32%	Binary Accuracy: <b>894</b> Ratio: 97.17%	Multiclass Accuracy: <b>892</b> Ratio: 96.96%
Inference Confidence: <b>High Confidence</b>	Binary Error: <b>26</b> Ratio: 2.83%	Multiclass Error: <b>28</b> Ratio: 3.04%
Cohen's Kappa: 87.3%	Confusion Matrix ▾	

Analysis Generated on 2024/06/18 at 15:40:00 by DESKTOP-PVBUDNC | 261 pixels per cm | 5 min area | 70 max area

**Dashboard**

**3. Multiclass Accuracy e Multiclass Error** são destinados a avaliar o desempenho de um modelo de IA ao diferenciar entre todas as classes presentes no modelo. **Multiclass Accuracy** calcula a porcentagem de previsões corretas para cada classe em relação a todas as previsões, enquanto o **Multiclass Error** representa a porcentagem de previsões incorretas entre essas classes. Essas métricas são essenciais para entender quão bem o modelo distingue entre várias classes e para avaliar o erro geral do modelo.

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**Feature Analysis**

Scatter Plot showing Mean Brightness vs Area. A legend indicates Screen Size from 11 to 18. A red dot highlights a specific data point.

Plot Parameters:

- Scatter
- Hexbin
- Log

X: Area, Y: Mean Brightness, C: Screen Size

Show: All Images

Seed number: 0, Class Probability: 99.5%, Screen Size: 18

Class: OK

Generate Plot, Save Image

**AI Model Parameters**

1. Avarage Entropy: 7.32%, Inference Confidence: High Confidence, Cohen's Kappa: 87.3%

2. Binary Accuracy: 894, Binary Error: 26, Ratio: 97.17%

3. Multiclass Accuracy: 892, Multiclass Error: 28, Ratio: 96.96%

Confusion Matrix

Analysis Generated on 2024/06/18 at 15:40:00 by DESKTOP-PVBUDNC | 261 pixels per cm | 5 min area | 70 max area

4. Clique no botão **Confusion Matrix** para abrir essa métrica que é uma tabela usada para definir o desempenho de um algoritmo de classificação. Uma matriz de confusão visualiza e resume o desempenho de um algoritmo de classificação, apresentando o rótulo previsto no eixo X e o rótulo verdadeiro (imagens que foram ajustadas pelo usuário) no eixo Y. Essa métrica é relevante apenas se o usuário tiver alterado as classes das imagens no Image Mosaic.

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Last Analys Model  
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AI Model Parameters
FS
→

Average Entropy 7.32%

Inference Confidence High Confidence

Cohen's Kappa 87.3%

Binary Accuracy **894**  
Ratio: 97.17%

Binary Error **26**  
Ratio: 2.83%

Multiclass Accuracy **892**  
Ratio: 96.96%

Multiclass Error **28**  
Ratio: 3.04%

**Confusion Matrix ^**

Model 224_MCL_RNXT_CAN_VNM_NATV00_D86										
True Label	Predicted label									
	Broken	Brown	Floaters	FM	Fragment	Full Black	Immature	Insect Dam.	Moldy	Ok
Broken	2	0	0	0	0	0	0	0	1	1
Brown	0	6	0	0	0	0	0	0	2	0
Floaters	0	0	8	0	0	0	0	0	0	0
FM	0	0	0	4	0	0	0	0	0	0
Fragment	0	0	0	0	6	0	0	0	0	0
Full Black	0	0	0	0	0	0	0	0	0	0
Immature	0	0	0	0	0	68	0	0	4	0
Insect Dam.	0	0	0	0	0	0	8	0	2	0
Moldy	0	1	0	0	0	0	0	4	5	0
Ok	8	0	0	0	3	0	0	0	786	1
Pod	0	0	0	0	0	0	0	0	0	0

Save Image
7.

Dashboard

5. Resultados na diagonal representam previsões corretas, já que **Predict Label** é igual ao **True Label**. Qualquer outra ocorrência representa onde e como o modelo errou durante a previsão.

6. Uma tabela com o nome das **classes**, **Precisão**, **Recall** e **F1-Score** é apresentada para cada classe. A definição dessas métricas é apresentada no texto abaixo da tabela.

7. O botão **Save Image** salva a matriz de confusão no formato .jpg.

**Precision:** For a given class, precision is the ratio of correctly predicted instances of that class to the total number of instances predicted as that class. It answers the question, "Of all the times the model predicted a class, how often was it correct?"

**Recall:** For a given class, recall is the ratio of correctly predicted instances of that class to the actual number of instances of that class in the analysis. It addresses the question, "Of all the actual instances of a class, how many did the model correctly predict?"

**F1 Score:** This is the harmonic mean of precision and recall. It is especially useful when the class distribution is uneven. An F1 score reaches its best value at 1 (perfect precision and recall) and its worst at 0.

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AI Model  
**Model Evaluation**

1. Add analysis files to the assessment list

**+ Add Analysis**

9.

No files selected

Clear List

2. Click 'Evaluate Model' after selecting the appropriate analysis files

**Evaluate Model****Dashboard**

8. Uma nova seção no menu lateral chamada **AI Model** tem como objetivo avaliar o desempenho de um modelo de IA após adequação das classes de diferentes análises, usando a ferramenta Image Mosaic. Para acessar esse recurso, clique em **Model Evaluation**.

9. Clique em **+Add Analysis** e selecione os arquivos que foram ajustados para a classificação de imagens.

File Name  
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10. Certifique-se de que apenas os arquivos que foram analisados com o mesmo modelo de IA sejam selecionados na lista. Remova aqueles que tenham sido classificados com outro modelo.

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## AI Model

### Model Evaluation

1. Add analysis files to the assessment list

+ Add Analysis

1 VN_ROB_FAQ_TTD	224_MCL_RNXT_CAN_VNM_NATV00_D86	
2 VN_ROB_FAQ_TTD_test	224_MCL_RNXT_CAN_VNM_NATV01_G85	
3 VN_ROB_G1S16_TTDSUPERCL	224_MCL_RNXT_CAN_VNM_NATV00_D86	
4 VN_ROB_S16_2BB	224_MCL_RNXT_CAN_VNM_NATV00_D86	
5 VN_ROB_S16_2BB_test	224_MCL_RNXT_CAN_VNM_NATV01_G85	
6 VN_ROB02585_3	224_MCL_RNXT_CAN_VNM_NATV00_D86	
7 VN_ROBDAKLAD_CALIB2	224_MCL_RNXT_CAN_VNM_NATV00_D86	
8 VN_ROBDAKLAK_1	224_MCL_RNXT_CAN_VNM_NATV00_D86	
9 VN_ROBDAKLAK_2	224_MCL_RNXT_CAN_VNM_NATV00_D86	
10 VN_ROBDAKLAK_3	224_MCL_RNXT_CAN_VNM_NATV00_D86	
11 VN_ROBDAKLAK_CALIB3	224_MCL_RNXT_CAN_VNM_NATV00_D86	

10.

Clear List

2. Click 'Evaluate Model' after selecting the appropriate analysis files

Evaluate Model

File Name  
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11. Clique em **Evaluate Model** para gerar a avaliação.

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## AI Model

### Model Evaluation

1. Add analysis files to the assessment list

+ Add Analysis

1 VN_ROB_FAQ_TTD	224_MCL_RNXT_CAN_VNM_NATV00_D86	
2 VN_ROB_G1S16_TTDSUPERCL	224_MCL_RNXT_CAN_VNM_NATV00_D86	
3 VN_ROB_S16_2BB	224_MCL_RNXT_CAN_VNM_NATV00_D86	
4 VN_ROB02585_3	224_MCL_RNXT_CAN_VNM_NATV00_D86	
5 VN_ROBDAKLAD_CALIB2	224_MCL_RNXT_CAN_VNM_NATV00_D86	
6 VN_ROBDAKLAK_1	224_MCL_RNXT_CAN_VNM_NATV00_D86	
7 VN_ROBDAKLAK_2	224_MCL_RNXT_CAN_VNM_NATV00_D86	
8 VN_ROBDAKLAK_3	224_MCL_RNXT_CAN_VNM_NATV00_D86	
9 VN_ROBDAKLAK_CALIB3	224_MCL_RNXT_CAN_VNM_NATV00_D86	
10 VN_ROBFAQ_02585_2	224_MCL_RNXT_CAN_VNM_NATV00_D86	
11 VN_ROBFAQ_TTD02585_1	224_MCL_RNXT_CAN_VNM_NATV00_D86	

Clear List

2. Click 'Evaluate Model' after selecting the appropriate analysis files

Evaluate Model

11.

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**Francisco Massucci Silveira**: Open Web Server

**Model Evaluation**

Selected Analysis: 37

Avarage Entropy	8.2%	Binary Accuracy	<b>44204</b> Ratio: 92.05%	Multiclass Accuracy	<b>3819</b> Ratio: 7.95%
Inference Confidence	High Confidence	Binary Error	<b>42714</b> Ratio: 7.95%	Multiclass Error	<b>5309</b> Ratio: 11.06%
Cohen's Kappa	77.9%				

**Confusion Matrix**

Model 224\_MCL\_RNXT\_CAN\_VNM\_NATV00\_D86

True label		Predicted										Class	Precision	Recall	F1-Score
		Broken	Brown	Floater	FM	Fragment	Full Black	Immature	Insect Dam.	Moldy	OK				
Broken	762	0	0	0	33	0	3	1	1	25	1				
Brown	41	1499	0	9	51	18	809	17	89	108	8				
Floater	4	0	760	0	18	0	6	0	2	56	0				
FM	0	0	0	1390	4	1	3	0	0	0	6				
Fragment	6	0	0	15	2315	0	2	1	0	3	0				
Full Black	1	15	0	4	10	132	36	2	20	3	4				
Immature	8	1	0	4	17	1	3554	2	9	111	0				
Insect Dam.	5	0	0	0	15	3	101	355	8	86	0				
Moldy	5	8	0	4	4	2	22	14	406	34	0				
OK	166	9	1	16	201	23	2900	30	41	31478	6				
Pod	0	0	0	14	2	0	0	0	0	0	63				

**12.**

**Precision:** For a given class, precision is the ratio of correctly predicted instances of that class to the total number of instances predicted as that class. It answers the question, "Of all the times the model predicted a class, how often was it correct?"

**Recall:** For a given class, recall is the ratio of correctly predicted instances of that class to the actual number of instances of that class in the analysis. It addresses the question, "Of all the actual instances of a class, how many did the model correctly predict?"

**F1 Score:** This is the harmonic mean of precision and recall. It is especially useful when the class distribution is uneven. An F1 score reaches its best value at 1 (perfect precision and recall) and its worst at 0.



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