COMPARAISON DE DIVERSES REPRÉSENTATIONS DE MALWARES POUR L'APPRENTISSAGE AUTOMATIQUE

PROJET DE RECHERCHE

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SOMMAIRE

- Notions de base
- Différentes représentations
- Construction d’une API
- Evolution de l’API
- Résultats

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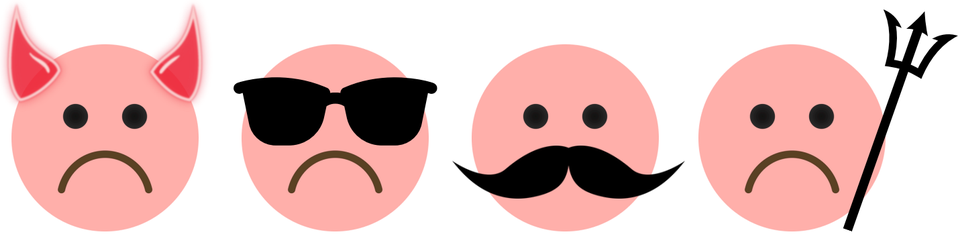
NOTIONS DE BASE

- Cleanwares

- Malwares



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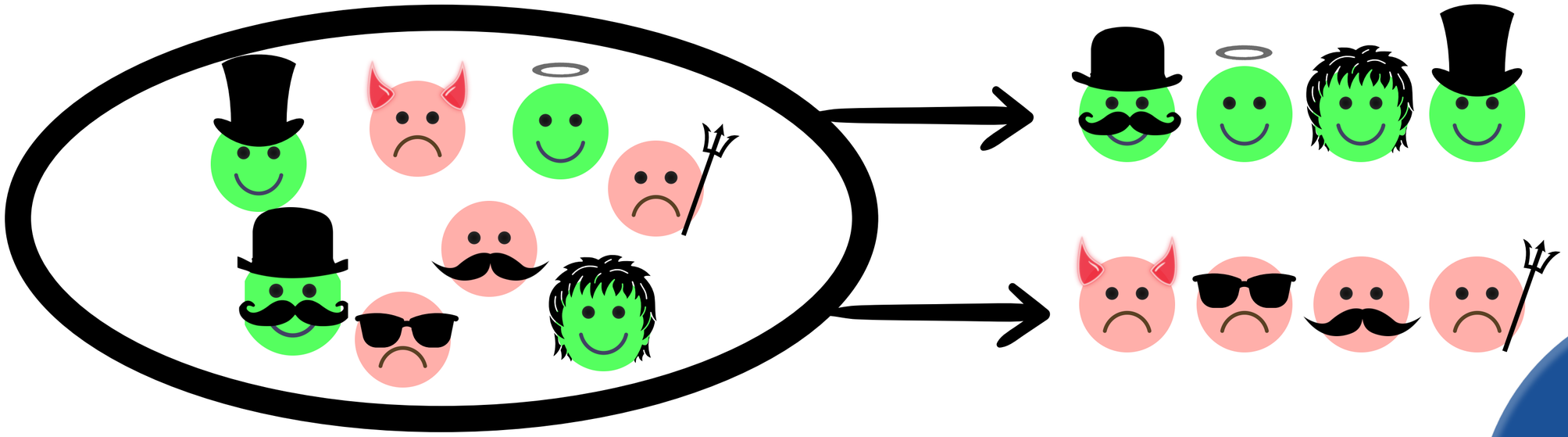
NOTIONS DE BASE

La Détection



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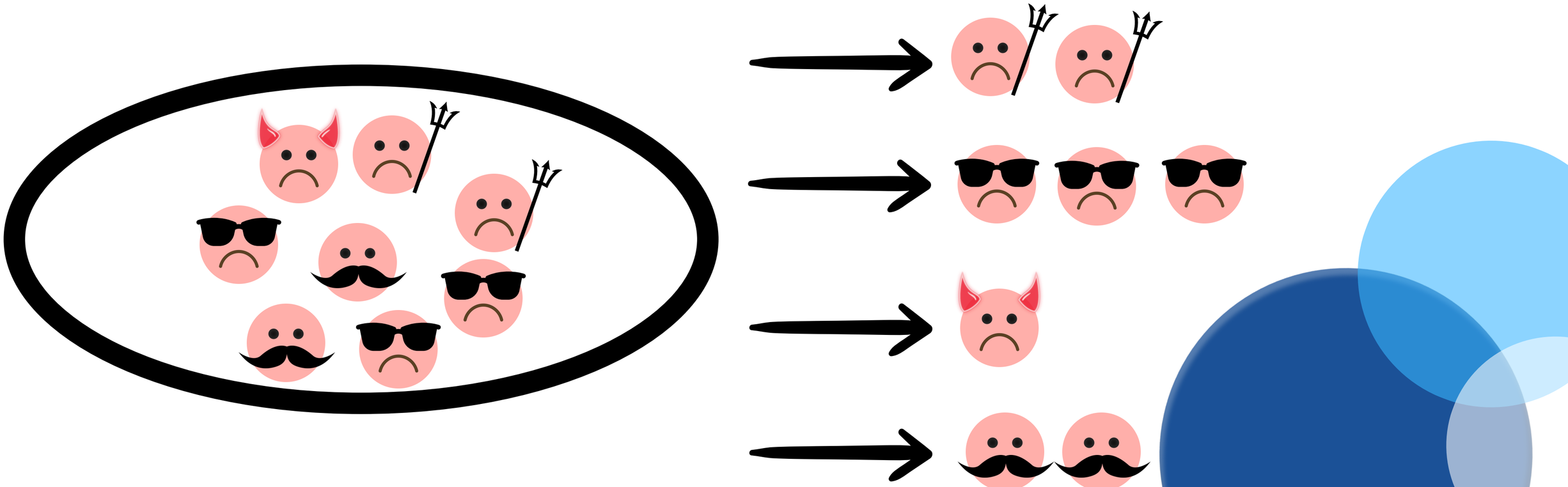
NOTIONS DE BASE

La Classification



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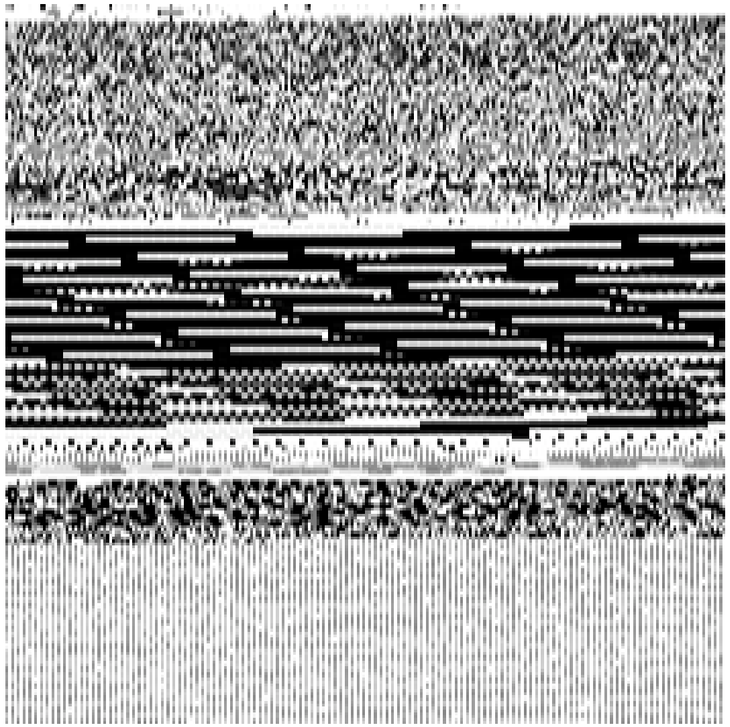
DIVERSES REPRÉSENTATIONS

- Grayscales
- Graphes d’entropie
- PE_feats
- EMBER



GRAYSCALES

- Statique, une image
- Chaque byte a une couleur qui correspond à sa valeur, 0 pour le noir, 255 pour le blanc

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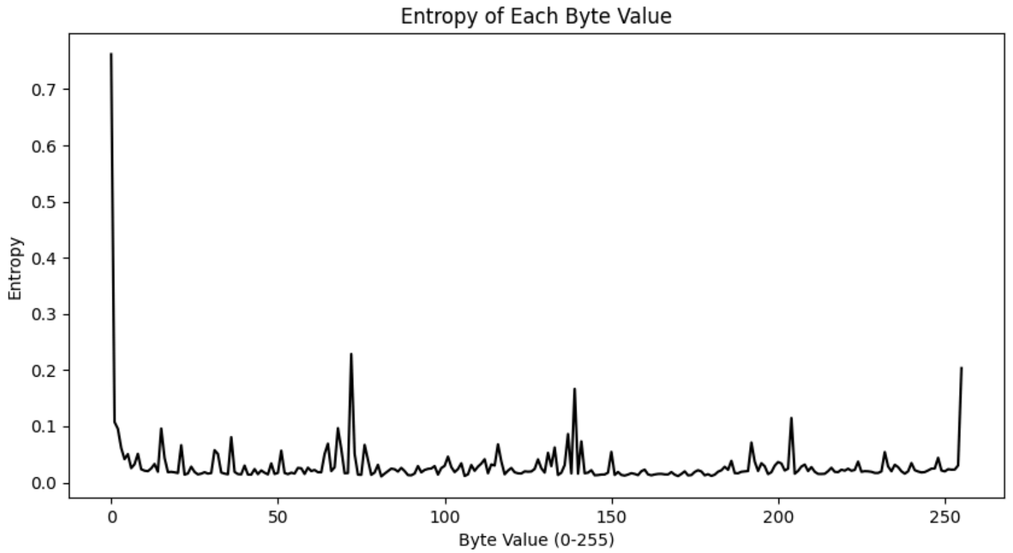
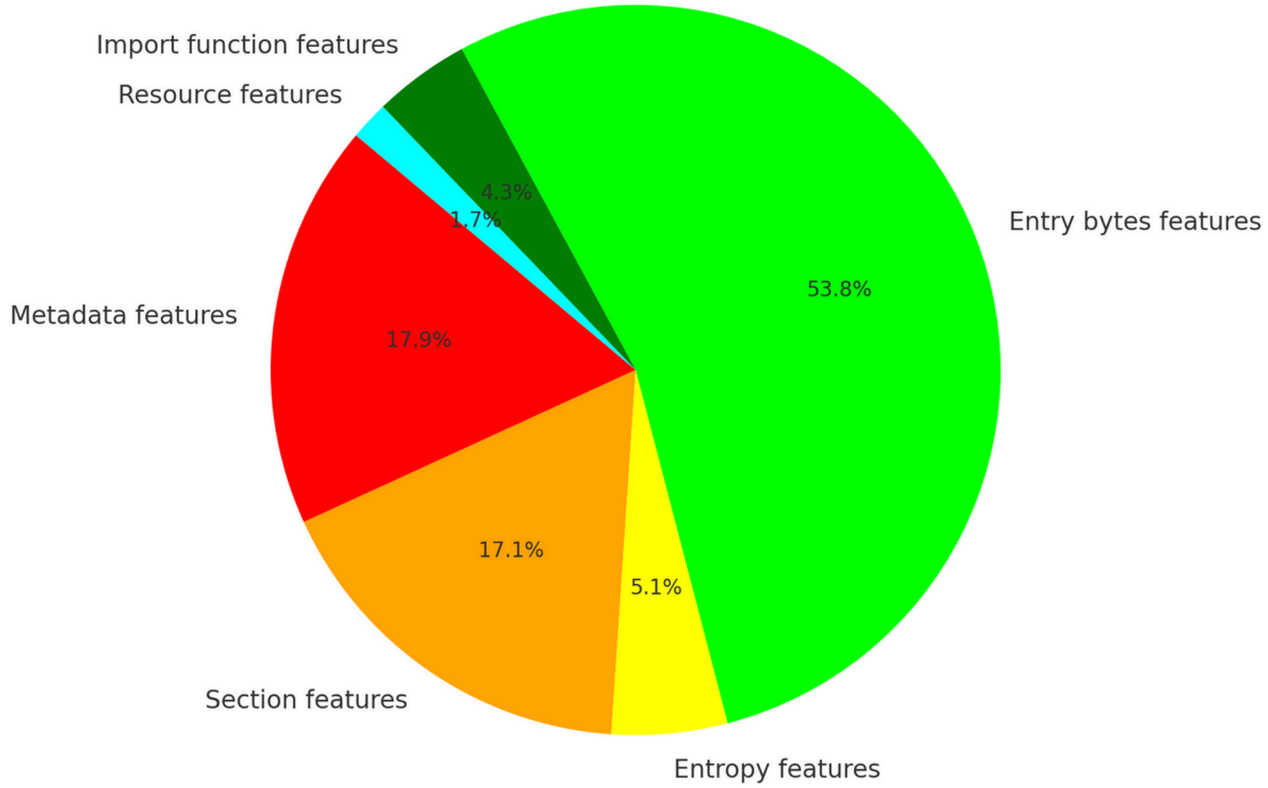
GRAPHES D’ENTROPIE



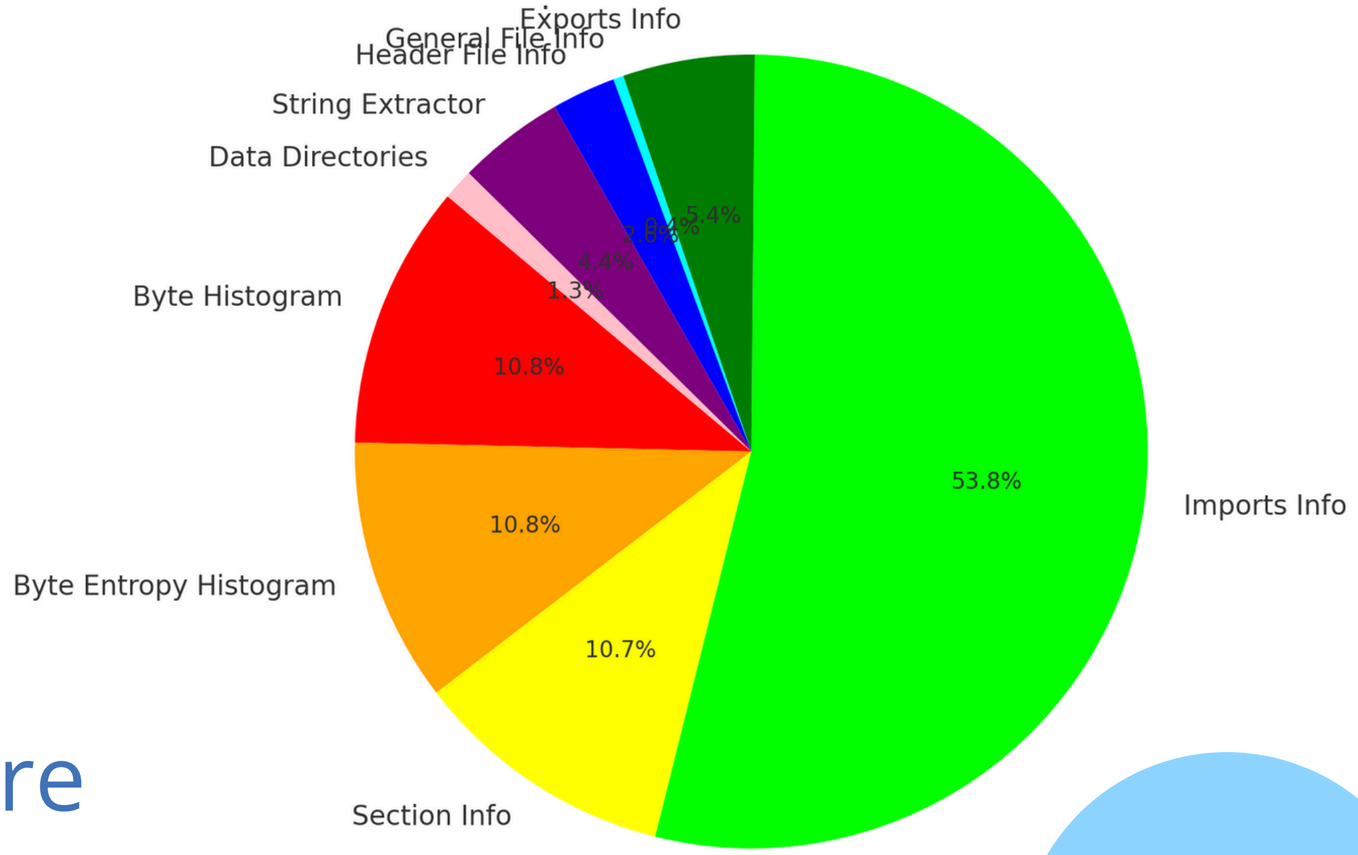
- Statique, une image
- Calcul de l’entropie de chaque *byte*

PE_FEATS

- Statique et tabulaire
- 119 features

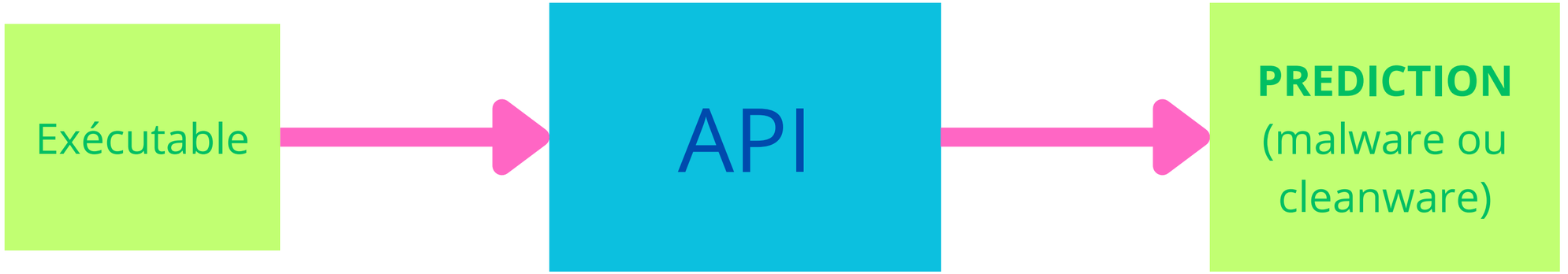


EMBER



- Statique et tabulaire
- *2381 features*
- 9 groupes de features

DÉTECTION



API la plus précise possible

API la moins coûteuse en temps possible

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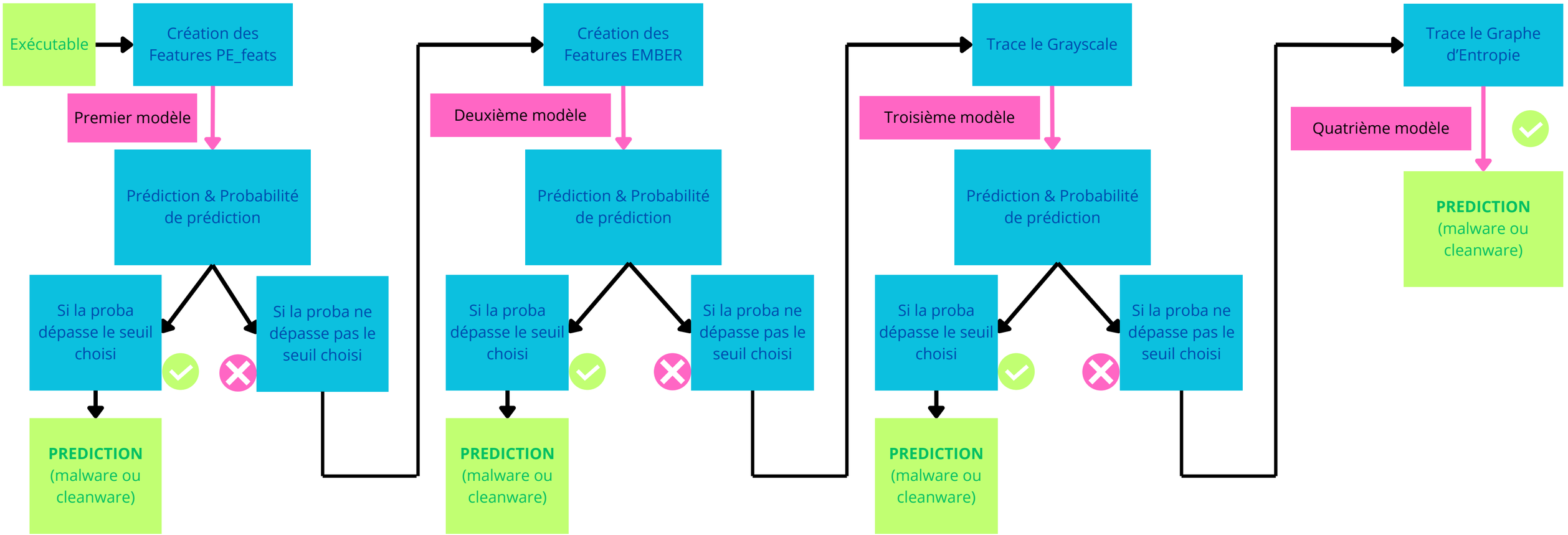
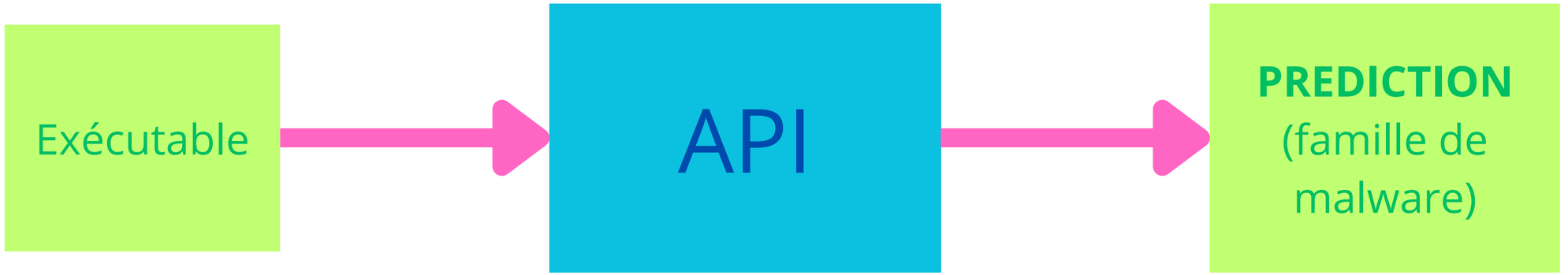
API POUR LA DÉTECTION



CLASSIFICATION

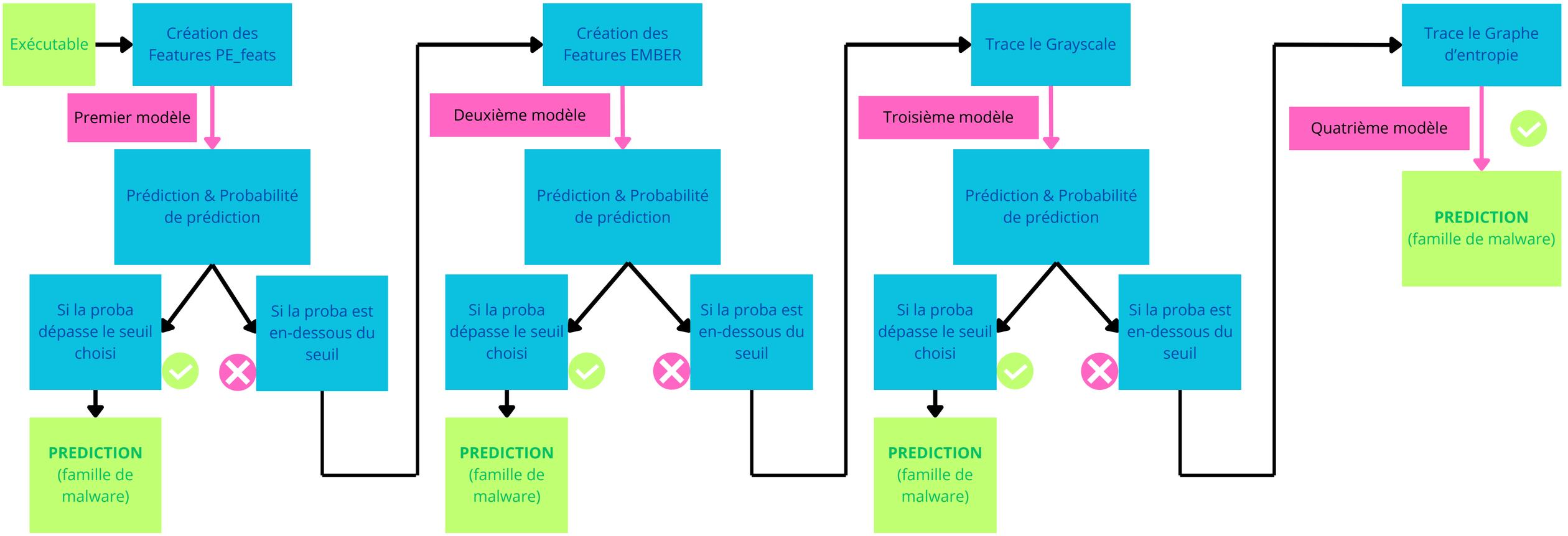


API la plus précise possible

API la moins coûteuse en temps possible

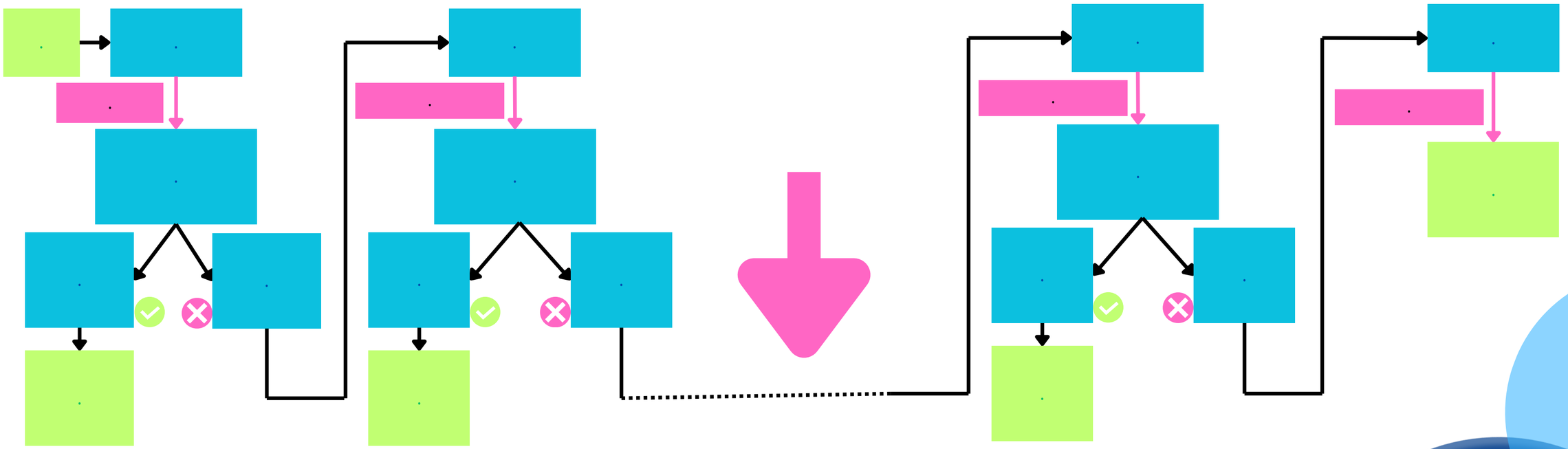
14

API POUR LA CLASSIFICATION

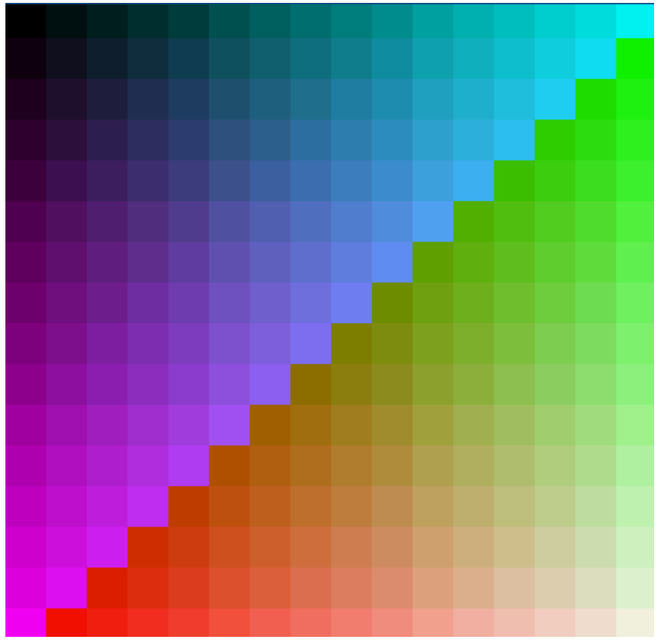


EVOLUTION DE L'API

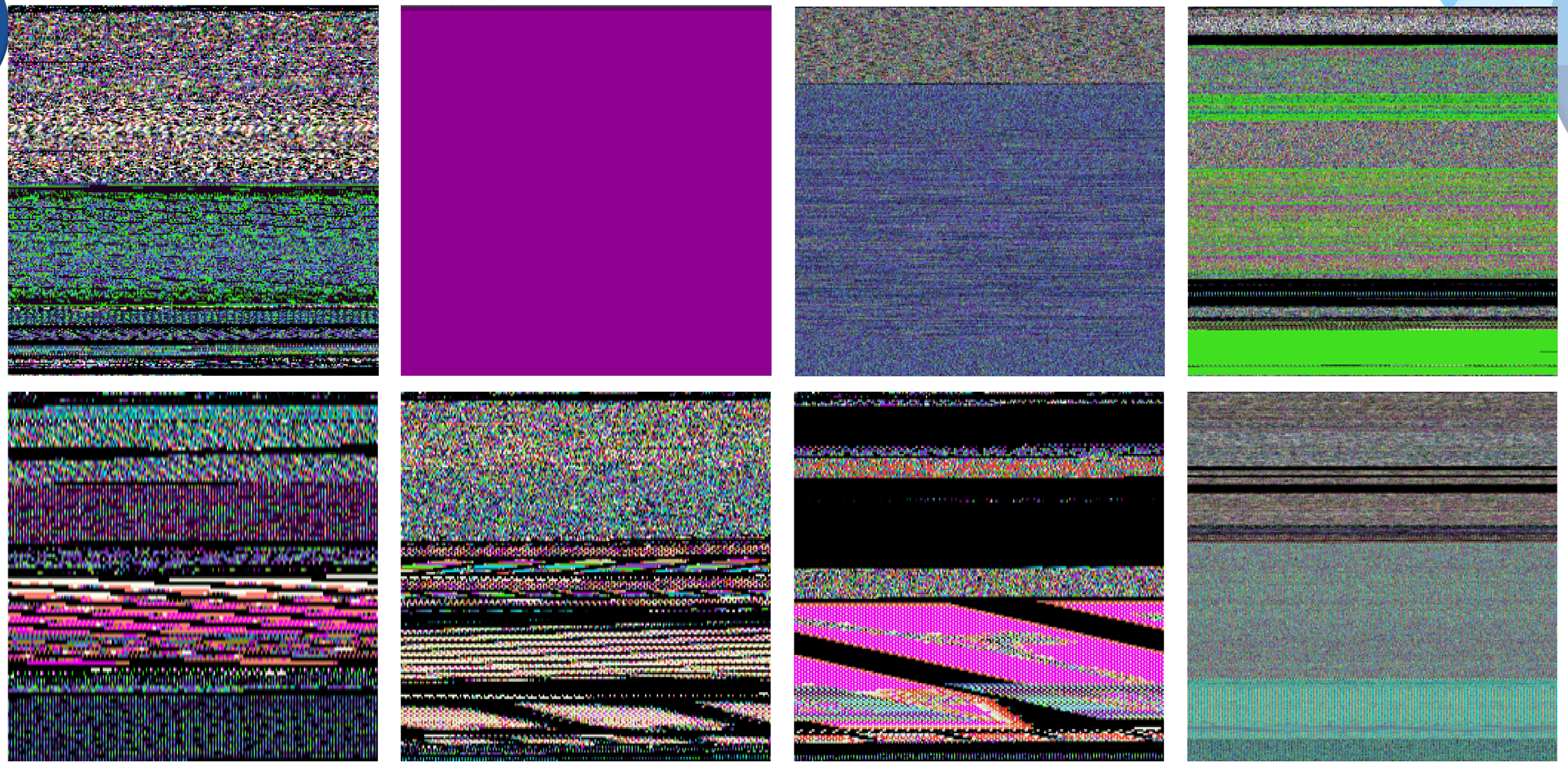
Nouveau Modèle



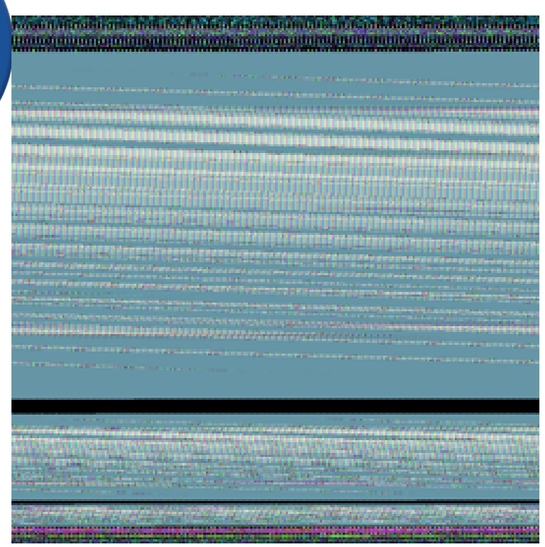
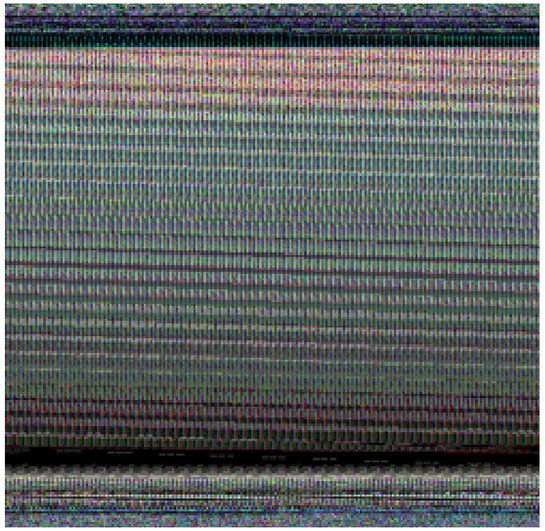
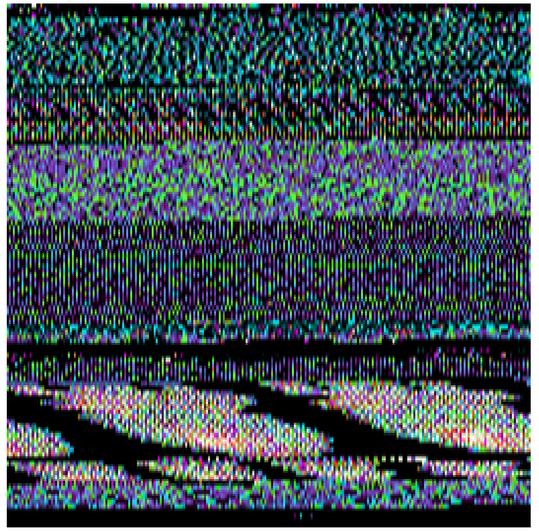
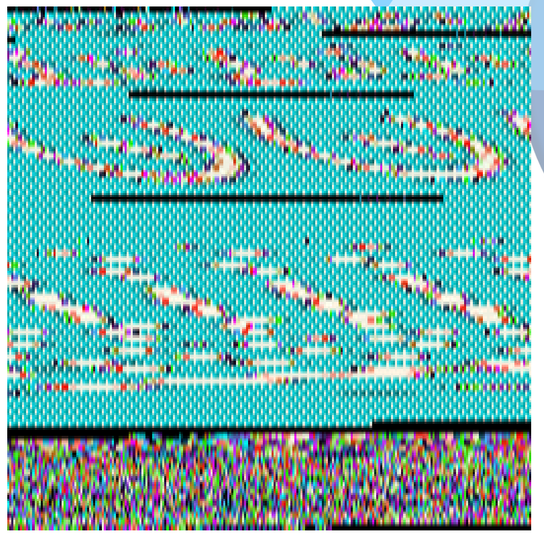
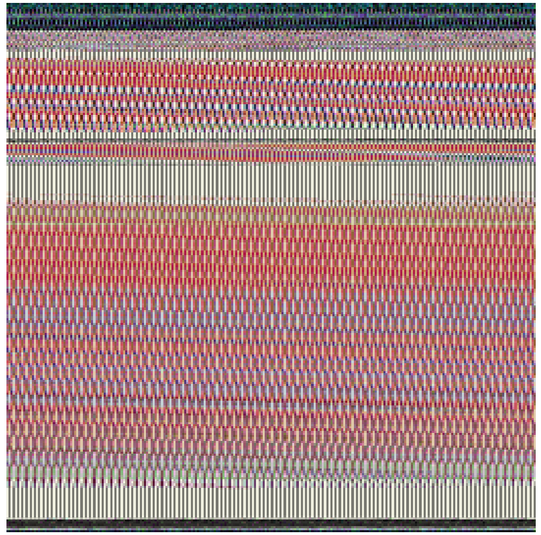
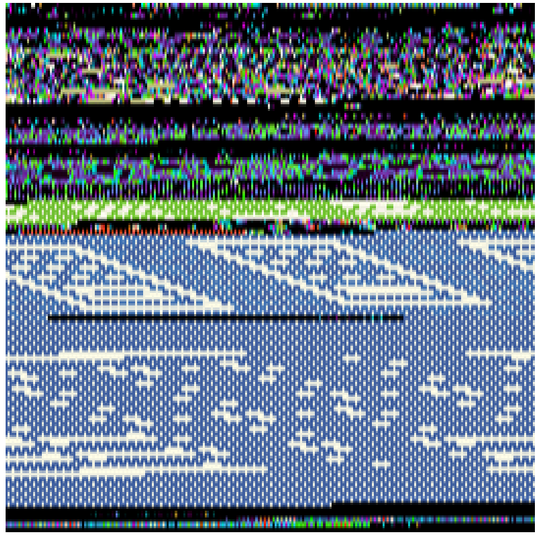
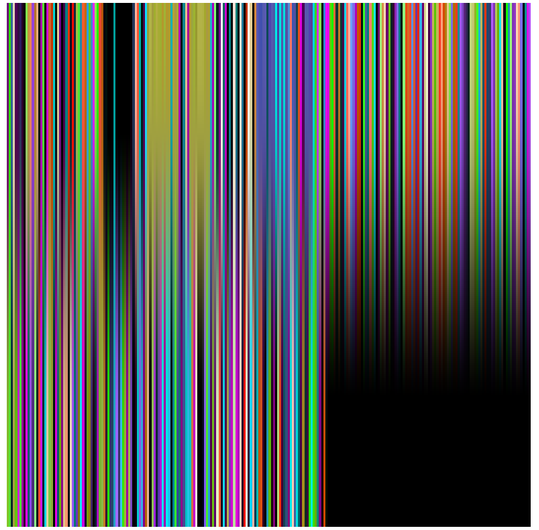
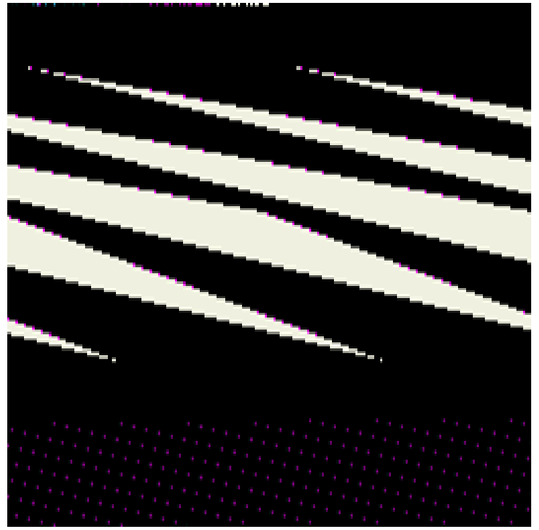
REPRÉSENTATION COLORÉE



- séparer le byte en deux *“nibbles”*
- les utiliser comme coordonnées
- lui donner la couleur de cet endroit sur la colormap



MALWARES

CLEANWARES

RÉSULTATS : DÉTECTION

	Accuracy	Precision	F1 score	Recall
PE_feats	99,2%	99,2%	99,2%	99,2%
Ember	100%	100%	100%	100%
Couleur	95,7%	96,0%	95,7%	95,7%
Grayscale	95,6%	95,7%	95,6%	95,6%
Entropie	93,4%	94,2%	93,5%	93,4%
API	100%	100%	100%	100%

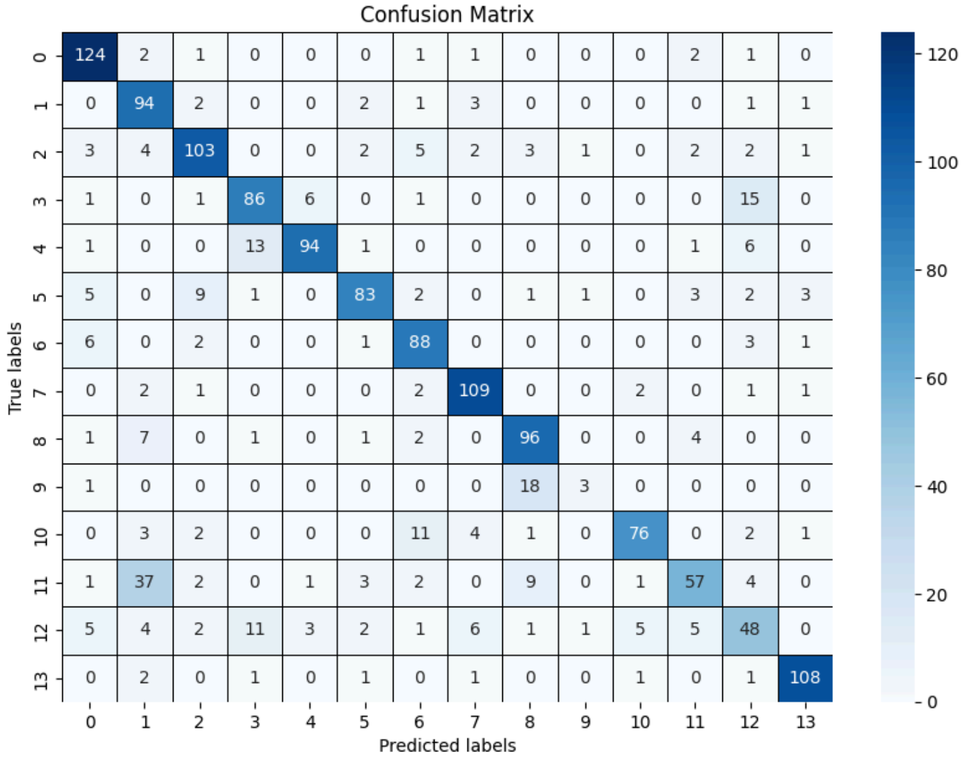
Seuil de confiance : 95 %

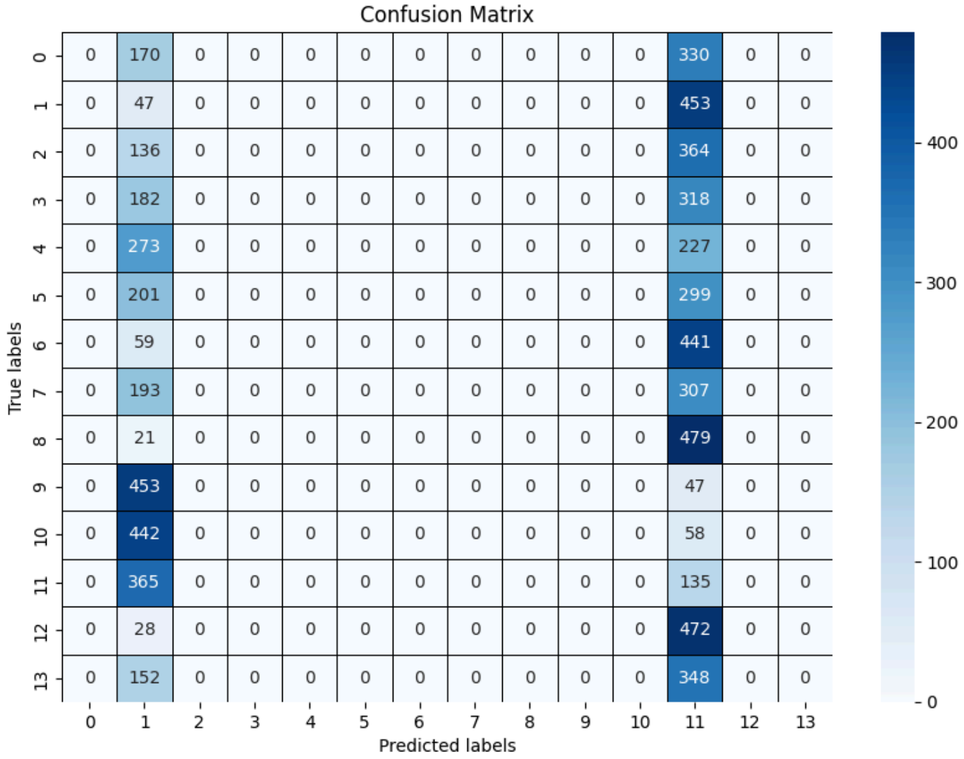
RÉSULTATS : CLASSIFICATION

	Accuracy
PE_feats	85,7%
Ember	97.1%
Couleur	83.2%
Grayscale	79.0%
Entropie	91.0%
API	69.21%

Seuil de confiance : 85%

EXEMPLE DES GRAYSCALES





ALERTE : OVERFITTING !

RÉSULTATS : CLASSIFICATION

	Accuracy	Vraie accuracy
PE_feats	95.2%	85.7%
Ember	97.1%	86.4%
Couleur	83.2%	13.1%
Grayscale	79.0%	2.6%
Entropie	91.0%	11.8%
API	69.21%	69.21%

Seuil de confiance : 85%

RÉSULTATS : CLASSIFICATION ÉVALUATION DE L'API

Seuil de confiance	Accuracy
75 %	84.99%
85 %	69.21%
95 %	77.27%

RÉSULTATS : CLASSIFICATION EMBER ET PE_FEATS

86.8 %

d’accuracy

Seuil de confiance : 85%

CONCLUSION

- Tabulaire vs Images
- Statique et dynamique
- La confiance des modèles