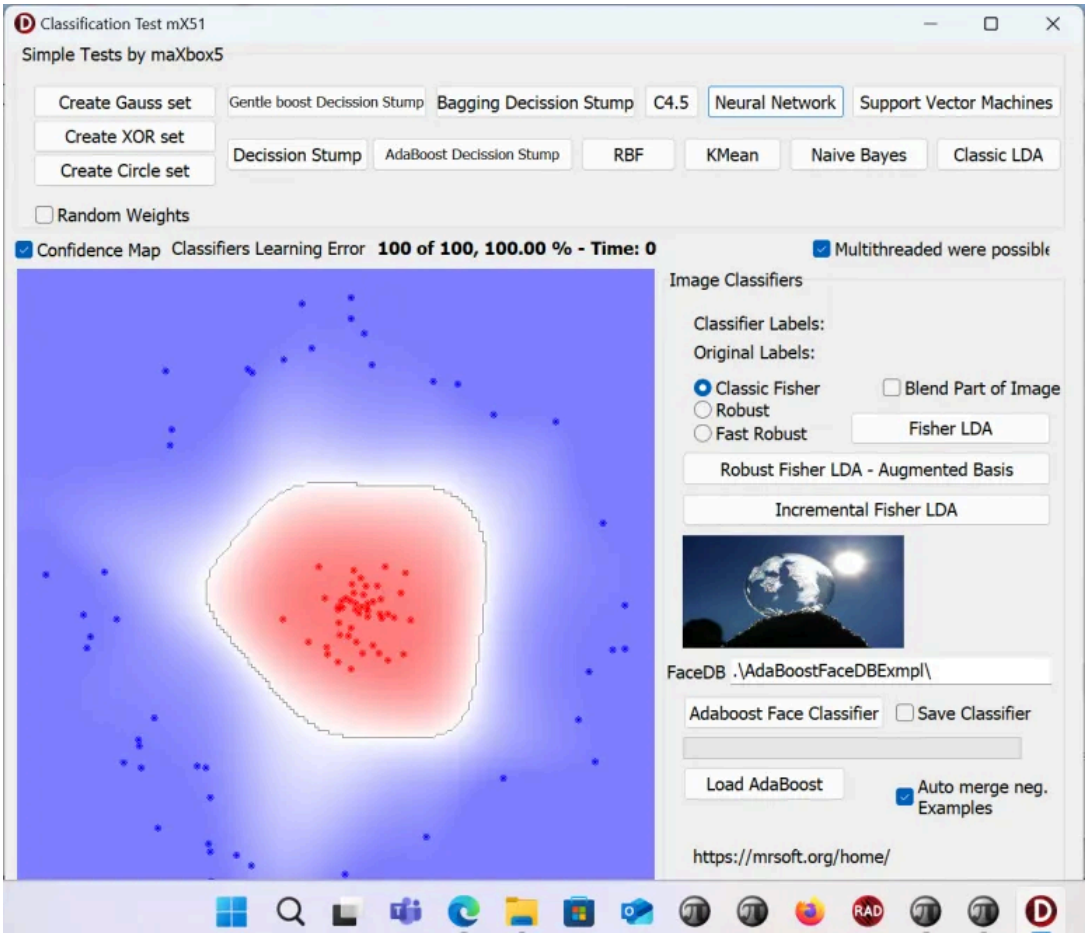
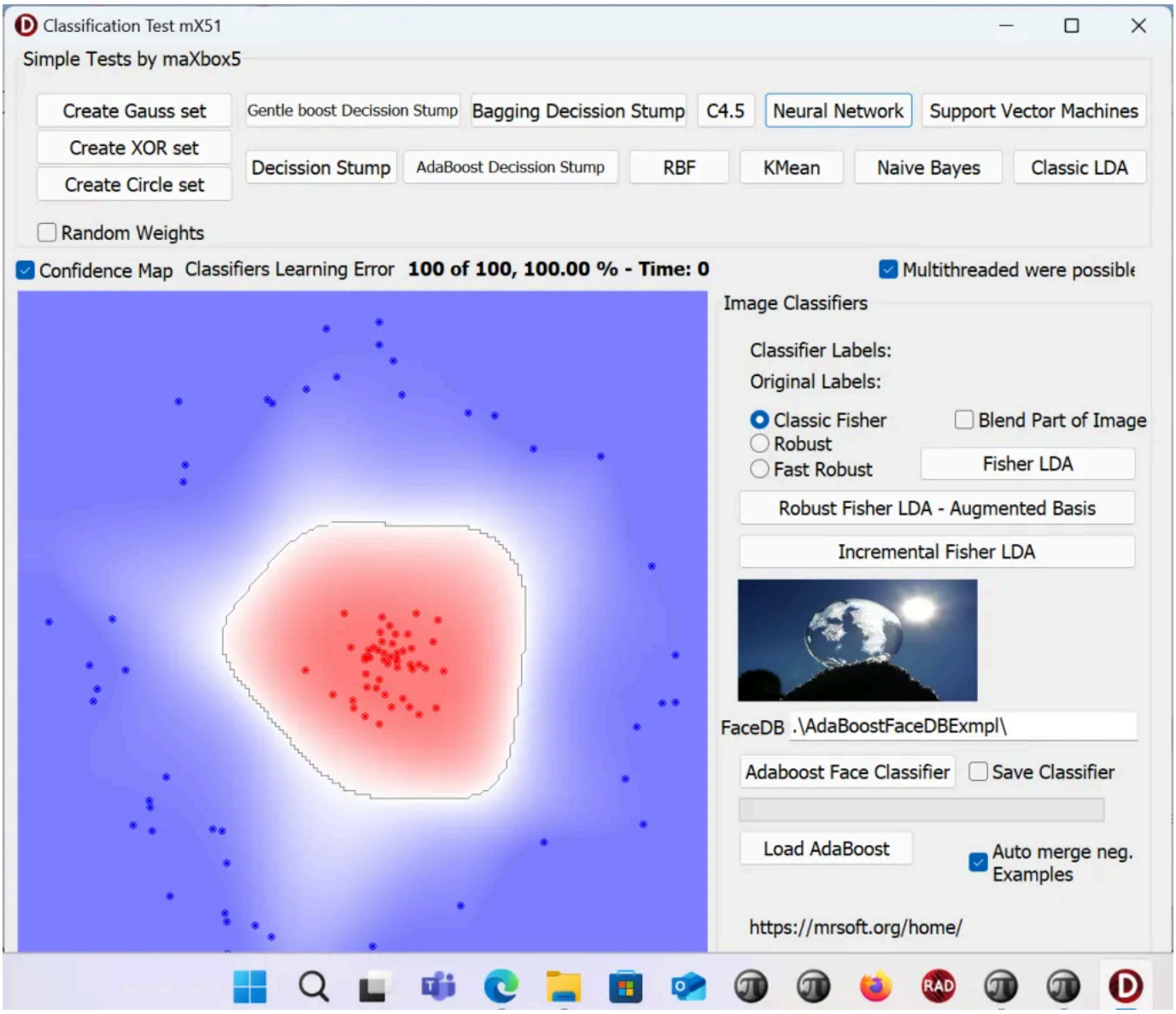
Test Classifier App

Max Kleiner
4 min read · Just now



This **library and** app **contains** classes **for** easy classifier design. **For** simple classifier design check **out** the TestApp — basically this **is** a **unit** test application — see there which classifieres face detectors are available **and** how **to** use them. It's recommended to have base knowledge about the underlying algorithms. Quite a few algorithms have been designed **with** robustness mind (robustness **in** terms **of** outlying pixels **or** occluded areas).

```
* Support Vector Machines with Least Squares and Lagragian Learning
* Ensemble Classification Algorithms:AdaBoost,GentleBoost and Bagging
* All the above classifiers may be used in the Ensemble classification tasks.
* Features Extractors: Haar1D, Haar2D and the Integral Image approach.
```

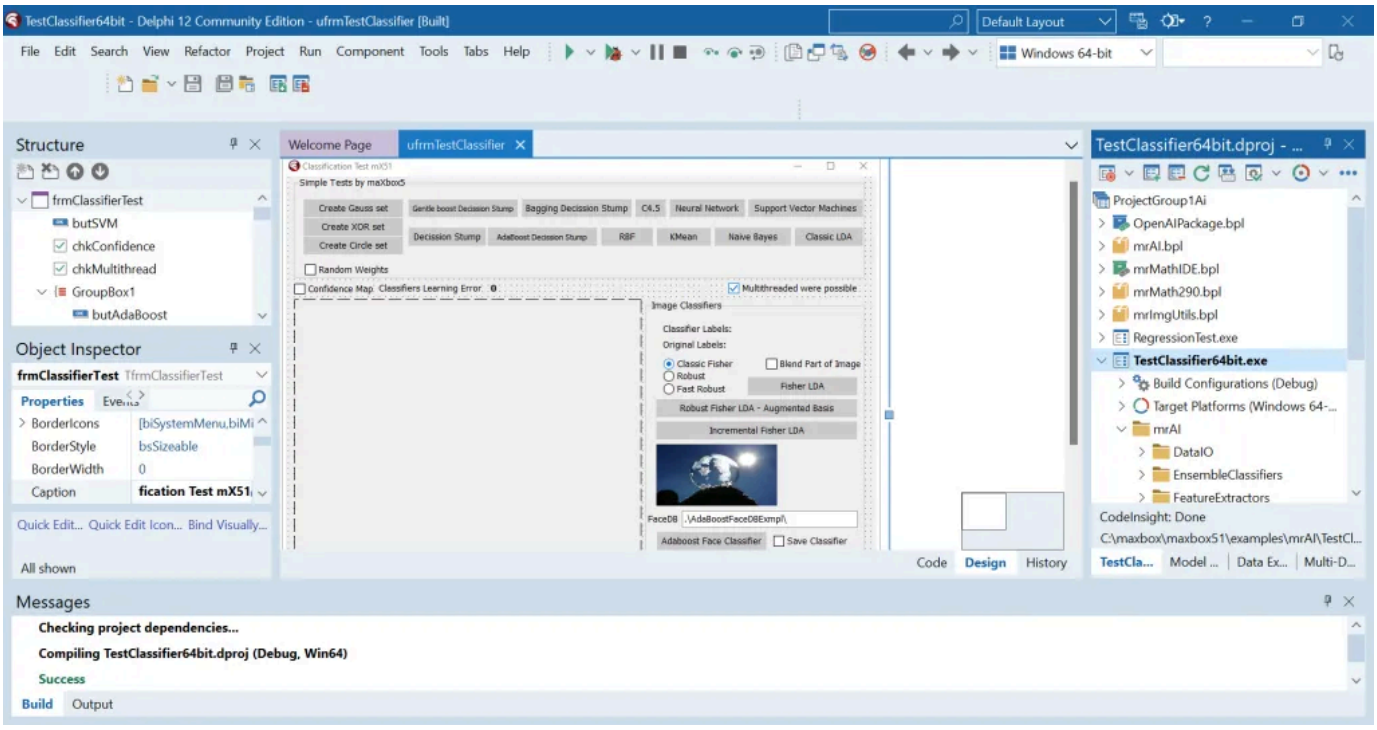


Test App for training & teaching

```
The package frommrsoft.org includes:
```

```
* Standard Fisher LDA classifier
* Robust (and Fast Robust) version of this classifier
* Incremental (and Robust) Fisher LDA classifier learning.
* Support Vector Machines (least squares and lagrangian learning)
* Naive Bayes
* Simple Decission stumps
* Radial basis function
* C4.5 Decission trees.
* K-means
* Ensemble classifiers: AdaBoost, Gentle Boost, Bagging
* Simple feed forward Neural Nets

On top of these classifiers there exists a few image database handling routines
and an 1D, 2D Haar Feature extractor which is based on an integral image approach.

A testing application TestClassifier.dpr which shows the usage and performance of these classifiers
on various tasks (e.g. face recognition) which we slightly improved, compiled and signed can be found
on git or sourceforge:

https://github.com/maxkleiner/mrai_mx5/tree/master/TestApp

https://sourceforge.net/projects/maxbox5/files/binaries/TestClassifier64bit.exe/download
```

```
uses BaseMatrixExamples, math, mathutilfunc, SimpleDecisionStump, AdaBoost,
     CustomBooster, Bagging, EnsembleClassifier, FisherBatchLDA, FisherClassifiers,
     ImageDataSet, ImageMatrixConv, {jpeg,} IncrementalImageDataSet,
     IncrementalFisherLDA, FisherIncrementalClassifiers, BaseIncrementalLearner,
     IntegralImg, Haar2DDataSet, MatrixImageLists, BinaryReaderWriter,
     BaseMathPersistence, DecisionTree45, TreeStructs, NaiveBayes, SVM, RBF,
     kmeans, NeuralNetwork, JSONReaderWriter, MatrixASMStubSwitch, ThreadedMatrix;

unit ufrmTestClassifier;

interface

{.$DEFINE INITRANDSEED}  // uncomment if you do not want the same train set

uses
  Windows, Messages, SysUtils, Variants, Classes, Graphics, Controls, Forms,
  Dialogs, BaseClassifier, ExtCtrls, StdCtrls, Matrix, ComCtrls, Haar2DAdaBoost,
  Haar2DImageSweep, Image2DSweep, Types, Vcl.Imaging.jpeg;

type
  TTrainSetType = (stGauss, stXOR, stCircles);
type
  TfrmClassifierTest = class(TForm)
```



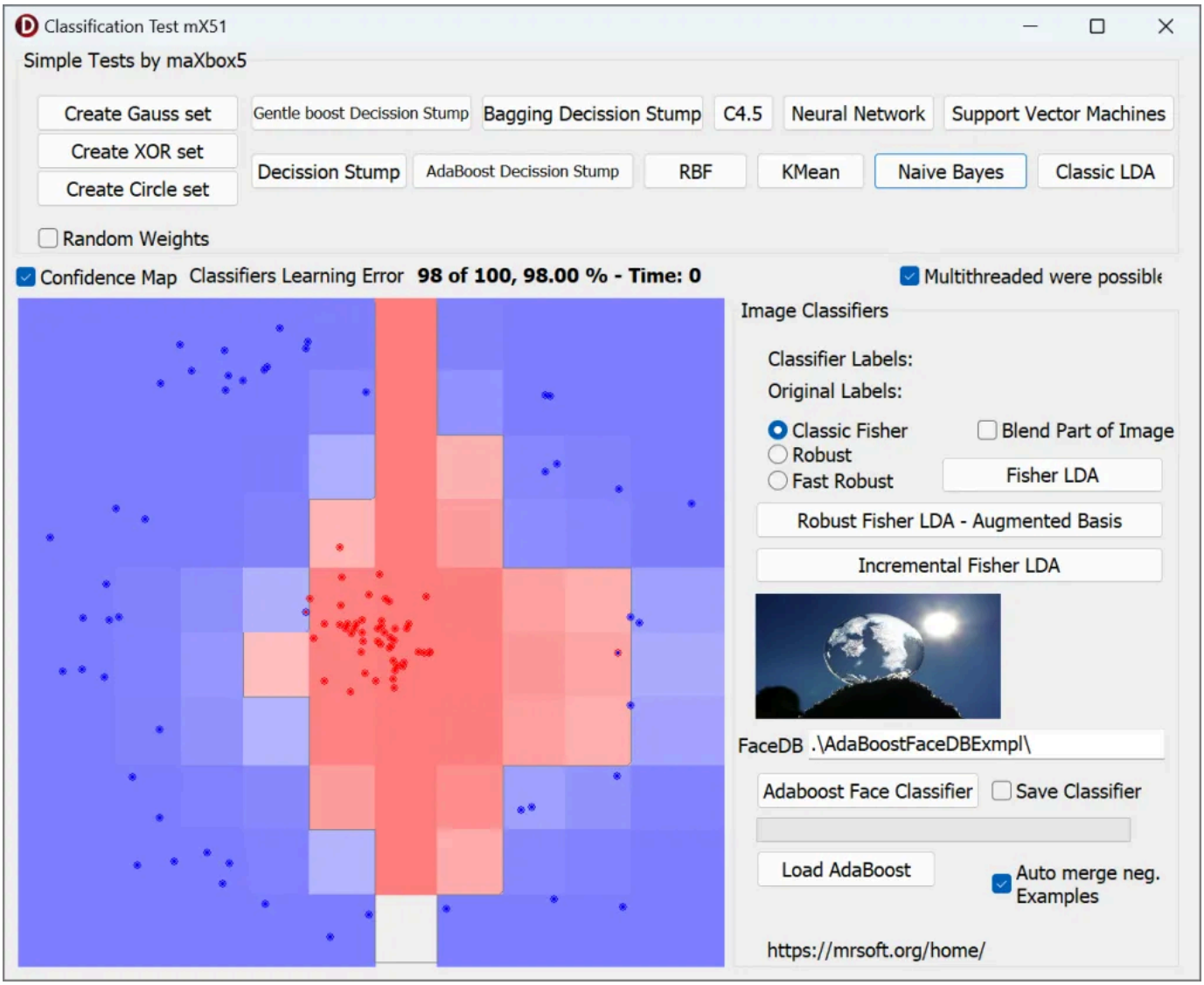
Build with Embarcadero compiler D12.1

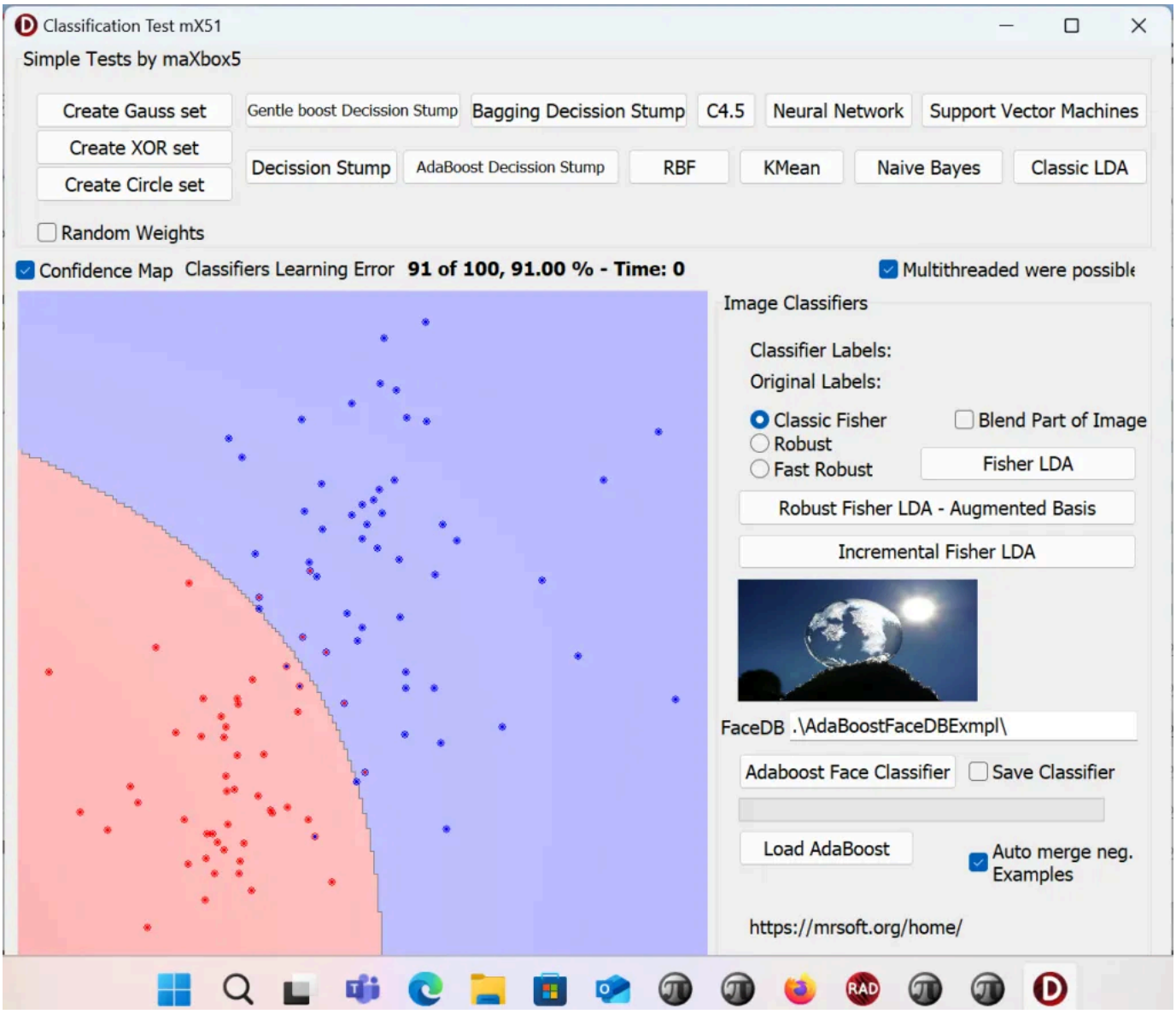
The source with precompiled binaries (This library is an extension of the **mrMath, mrAI** and **mrImgUtils** libraries and therefore depending on it!) are on:

https://github.com/maxkleiner/mrai_mx5/tree/master/TestApp

The momentum approach has been added to the **neural network learner**. In addition a certain percentage of the training set can now be selected to be a distinct validation set. This functionality has been moved into the base class so it may be used for other custom algorithms as well.

A simple feed forward neural network has also been added to the AI library whic hincludes linear, tanh and exponential neuron activation. For the learning step a simple backpropagation aglorithm has been added. The library now utilizes the new random engine provided by the mrMath library and also a confidence map:


Classification Test mX51
Simple Tests by maXbox5
Create Gauss set
Create XOR set
Create Circle set
Gentle boost Decission Stump
Bagging Decission Stump
C4.5
Neural Network
Support Vector Machines
Decission Stump
AdaBoost Decission Stump
RBF
KMean
Naive Bayes
Classic LDA
Random Weights
Confidence Map
Classifiers Learning Error
98 of 100, 98.00 % - Time: 0
Multithreaded were possible
Image Classifiers
Classifier Labels:
Original Labels:
Classic Fisher
Robust
Fast Robust
Blend Part of Image
Fisher LDA
Robust Fisher LDA - Augmented Basis
Incremental Fisher LDA
FaceDB .\AdaBoostFaceDBExmpl\
Adaboost Face Classifier
Save Classifier
Load AdaBoost
Auto merge neg. Examples
https://mrsoft.org/home/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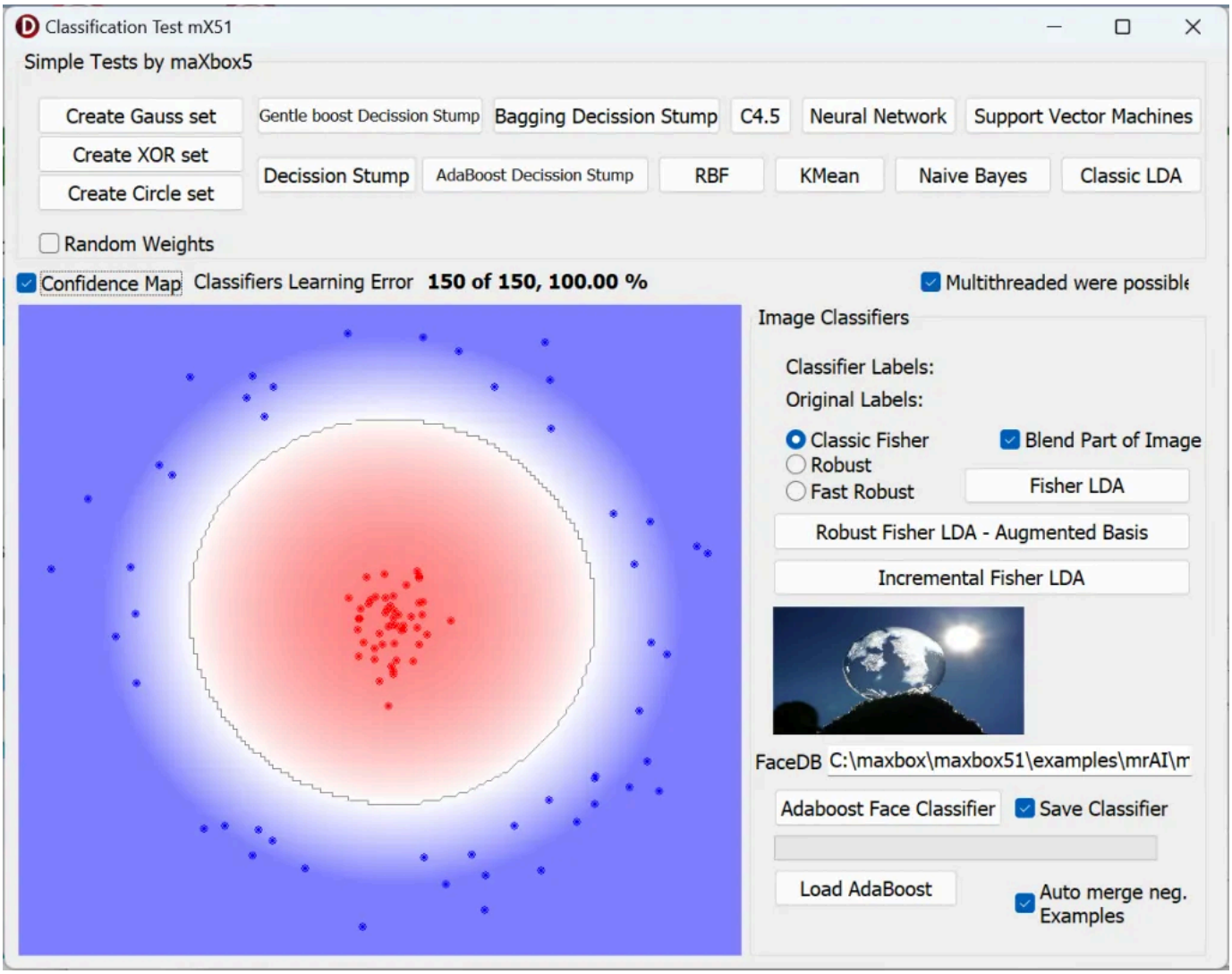
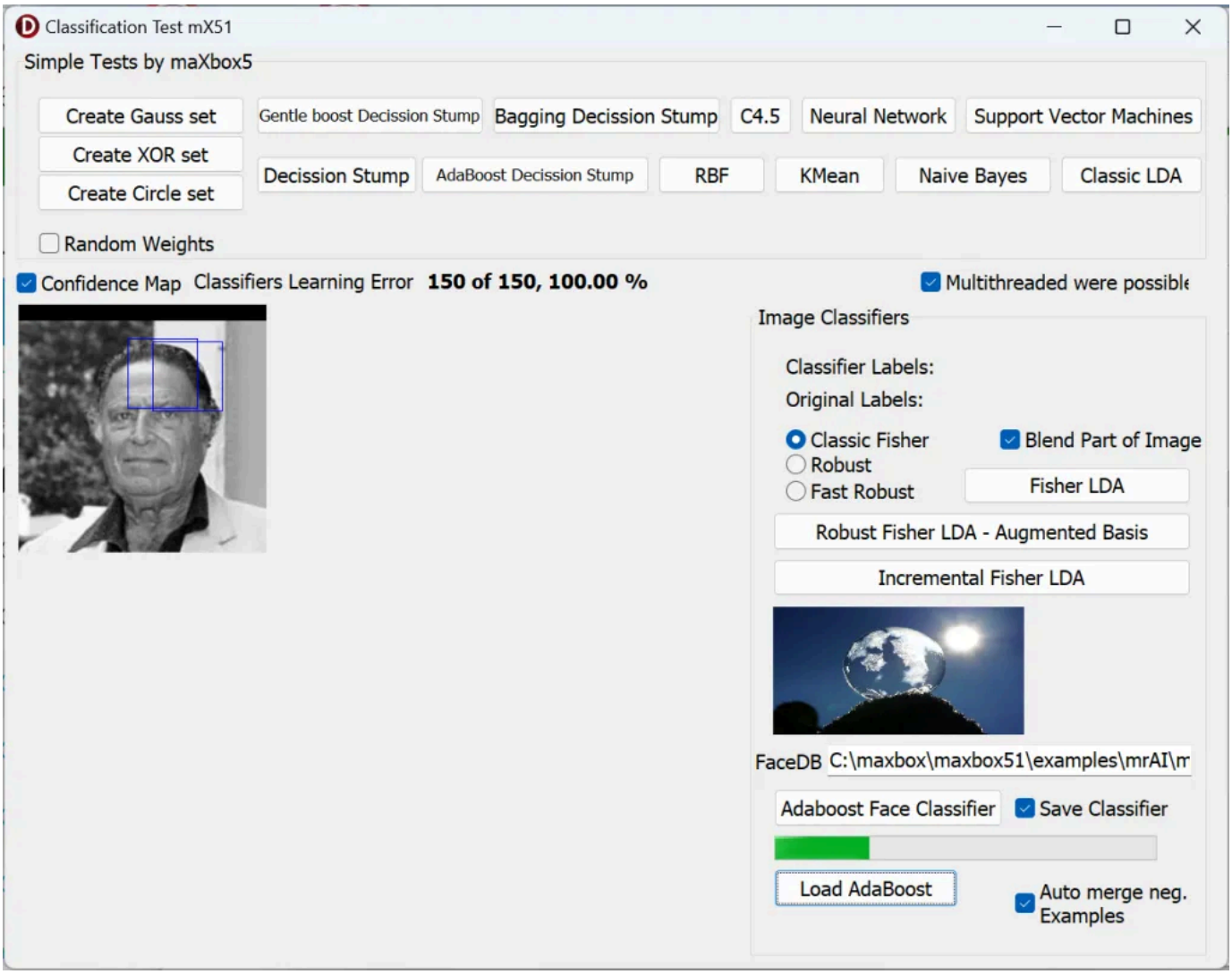


Classifiers with confidence map

The kmeans classifier features normal or median update steps as well as kmeans++ initial center search. The Radial Basis Classifier features **different Kernels** (Gauss, Quad, Inverse Multiquad, Multiquad) as well as different radial basis extractors. These are randomly selected subset from the learning set or mean/median of the class centers.

A simple version of the Viola Jones Face detection algorithm is also available as unit and app test: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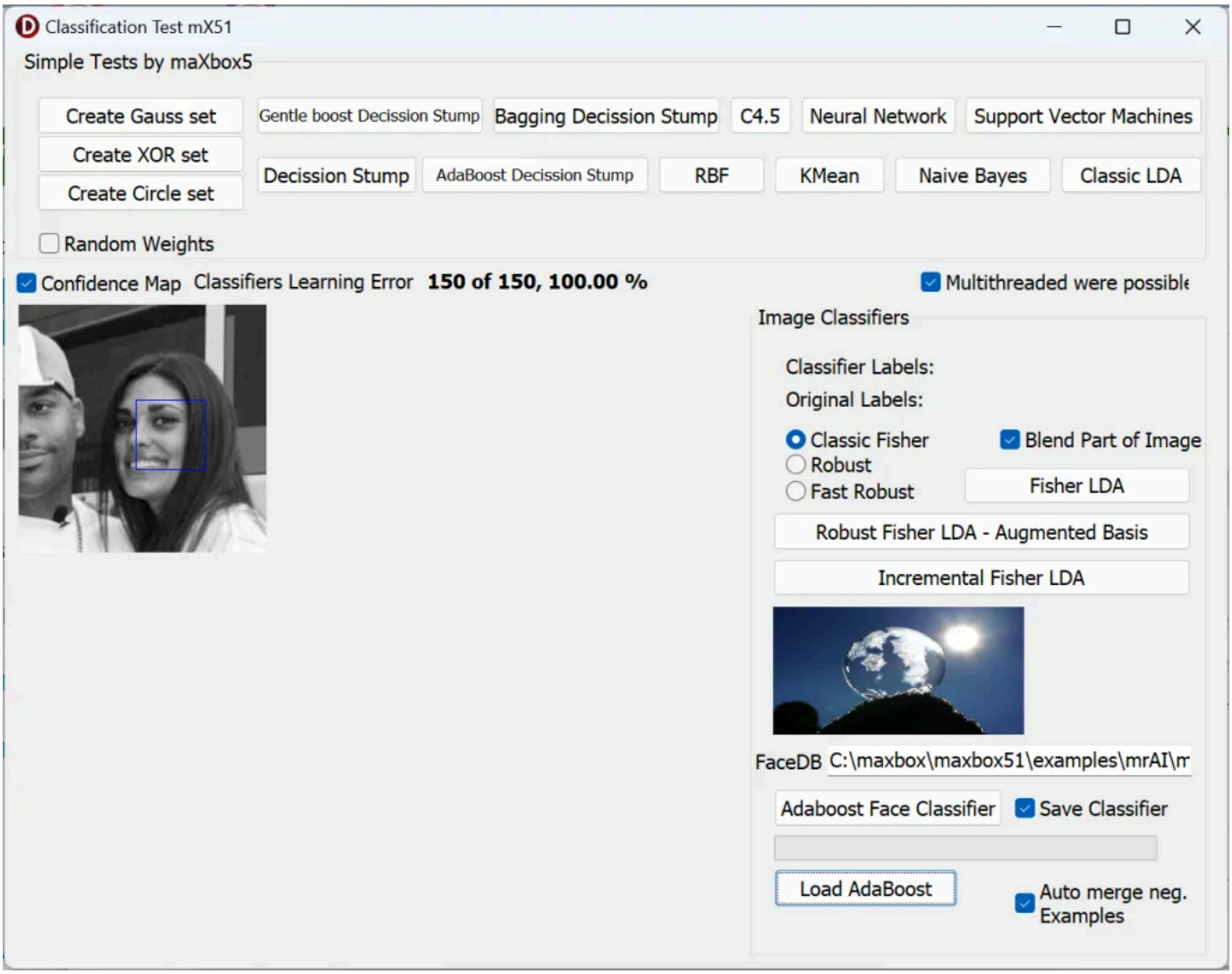
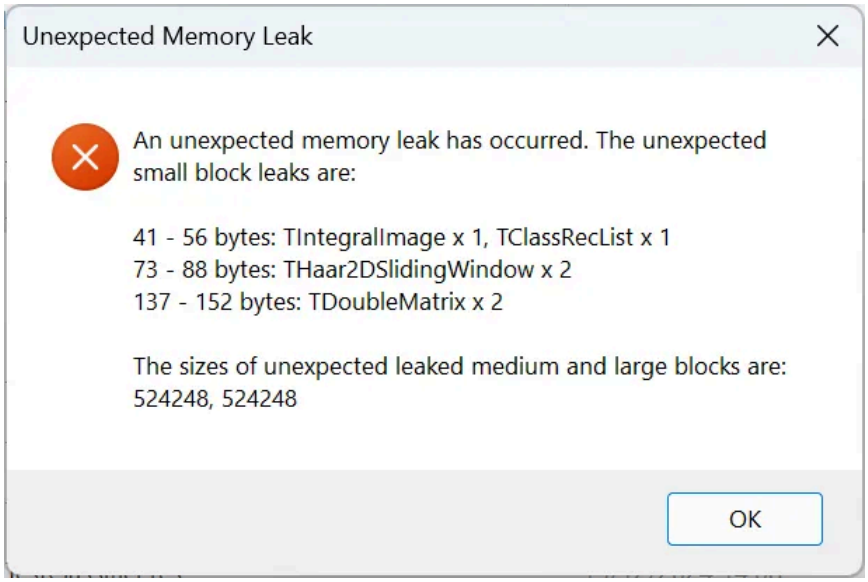
Fisher LDA
Robust Fisher LDA - Augmented Basis
Incremental Fisher LDA
FaceDB
C:\maxbox\maxbox51\examples\mrAI\m
Adaboost Face Classifier
Save Classifier
Load AdaBoost
Auto merge neg. Examples



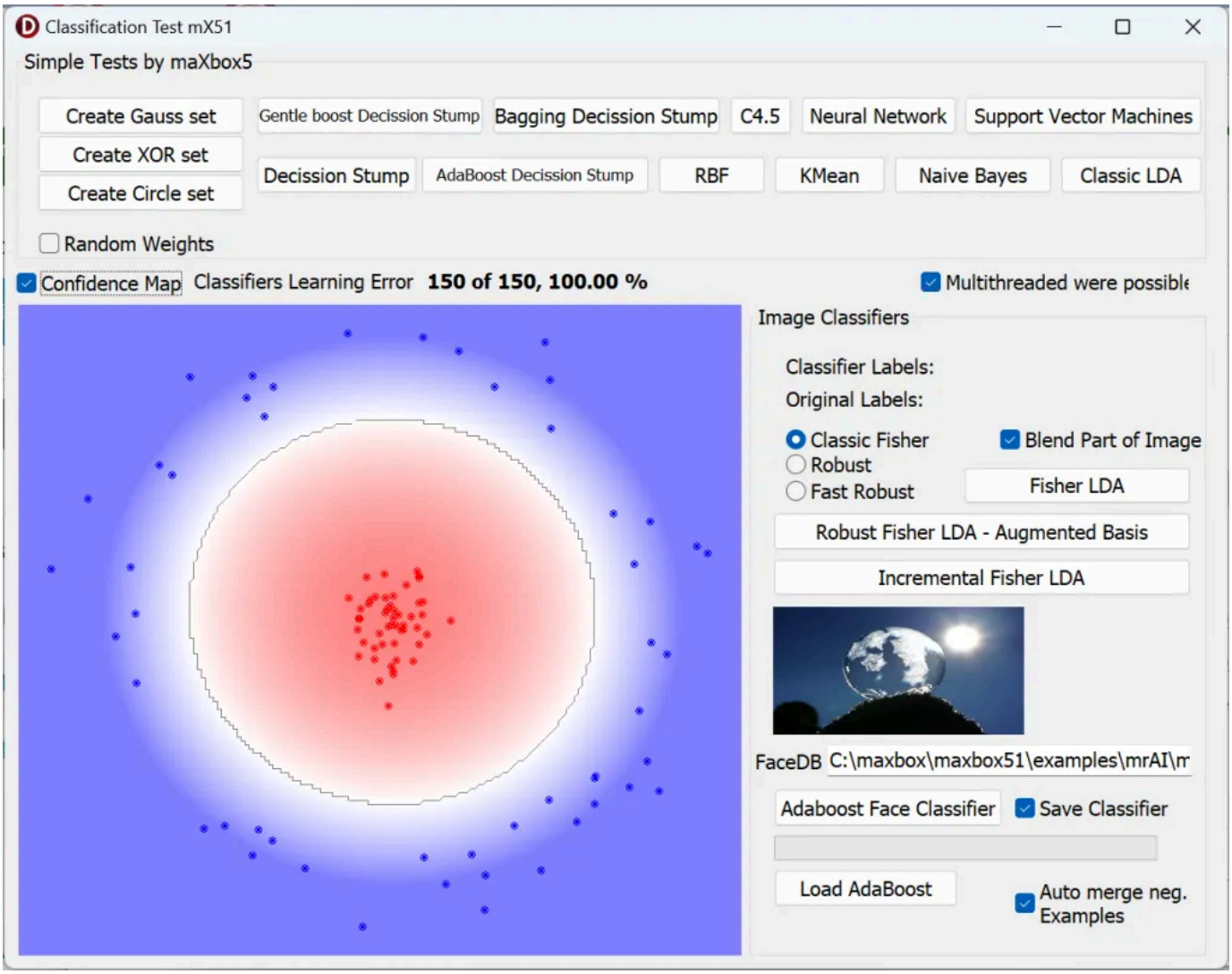
Face Detection Playground

Models can be saved and loaded from files like haarClassifier21.cls. Tested also with memleaks cause this is not very troublesome but if this already used memory has some NAN in it it may happen that the QR, Cholesky, LU and SVD decompositions raise exceptions.



Conclusion: You can build and compile the whole library or start easy with the compiled app on git: TestClassifier64bit.exe

Or build then first download both of these 4 libraries **mrMath**290, **mrMathIDE**, **mrImgUtil**s, **mrAI** and compile the included dpk files. Also add the directories to the library (and or) search paths!



Originally published at http://maxbox4.wordpress.com on December 14, 2024.

Machine Learning | Computer Vision

Edit profile

Written by Max Kleiner

30 Followers · 3 Following

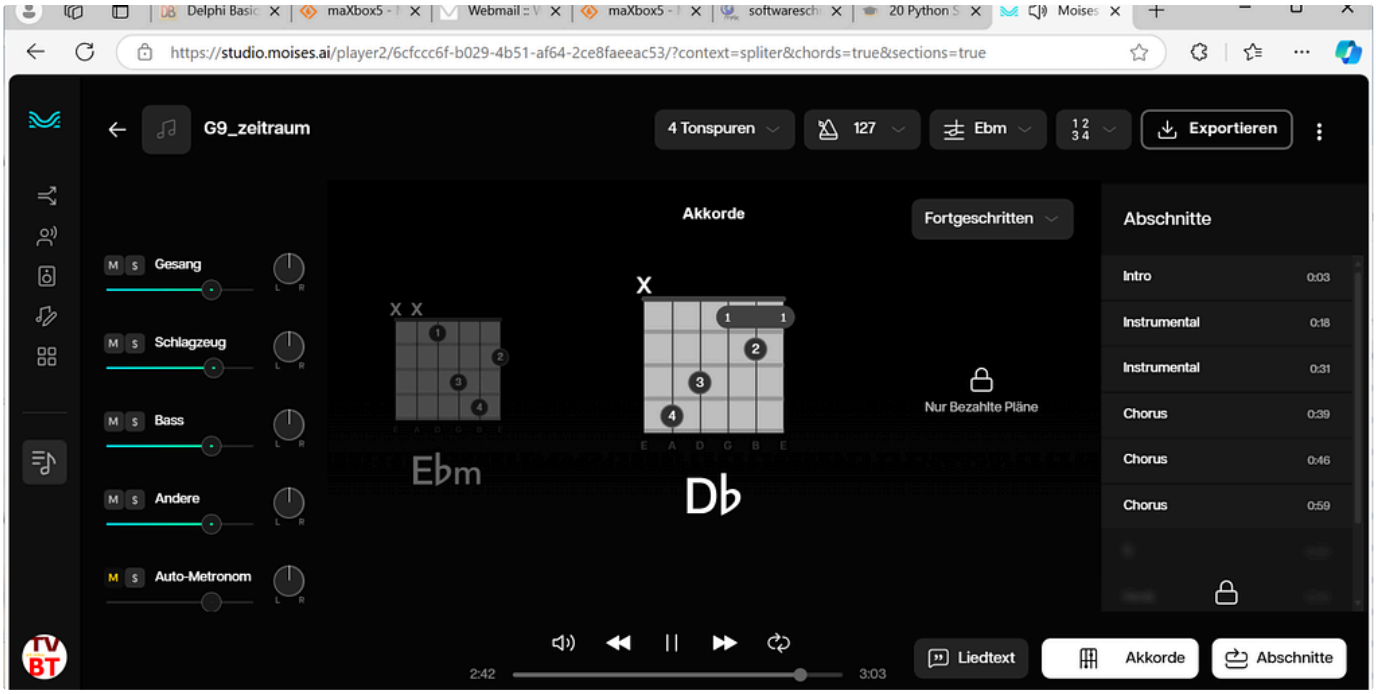
Max Kleiner's professional environment is in the areas of OOP, UML and coding - among other things as a trainer, developer and consultant.

No responses yet

What are your thoughts?

Respond

More from Max Kleiner

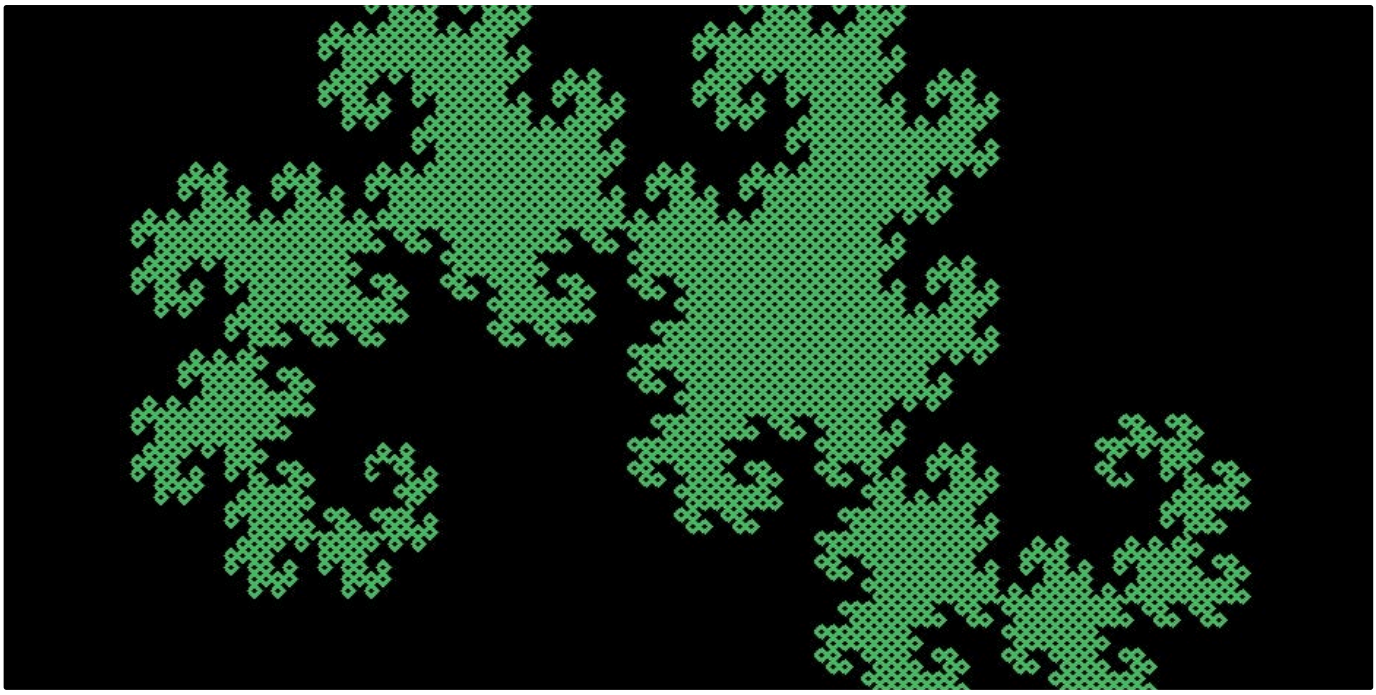


In Nerd For Tech by Max Kleiner

MIDI Music Magic

The General MIDI specification defines 128 instruments, and 47 percussion sounds. All channels except channel 9 (counting from zero) play...

Nov 15 4 1



Max Kleiner

Dragon Curve Sound

I want to show the dragon curve in five language soluitons:

Aug 8 6

29 - 36 bytes: TJsonValue x 2114313, String x 112
37 - 44 bytes: String x 106
45 - 52 bytes: TSynEditFoldRange x 4565, String x 108
53 - 60 bytes: TStringList x 4614, String x 2114382
61 - 68 bytes: String x 121
69 - 76 bytes: String x 114, Unknown x 94
77 - 84 bytes: String x 126
85 - 92 bytes: String x 91
93 - 100 bytes: String x 20
101 - 108 bytes: String x 63
109 - 116 bytes: String x 1
125 - 132 bytes: String x 1
173 - 188 bytes: Unknown x 16
381 - 412 bytes: Unknown x 16
797 - 876 bytes: Unknown x 1
1053 - 1148 bytes: TChart x 39

Max Kleiner

JSON Automation 2

//

May 5, 2021 27 1

In Nerd For Tech by Max Kleiner

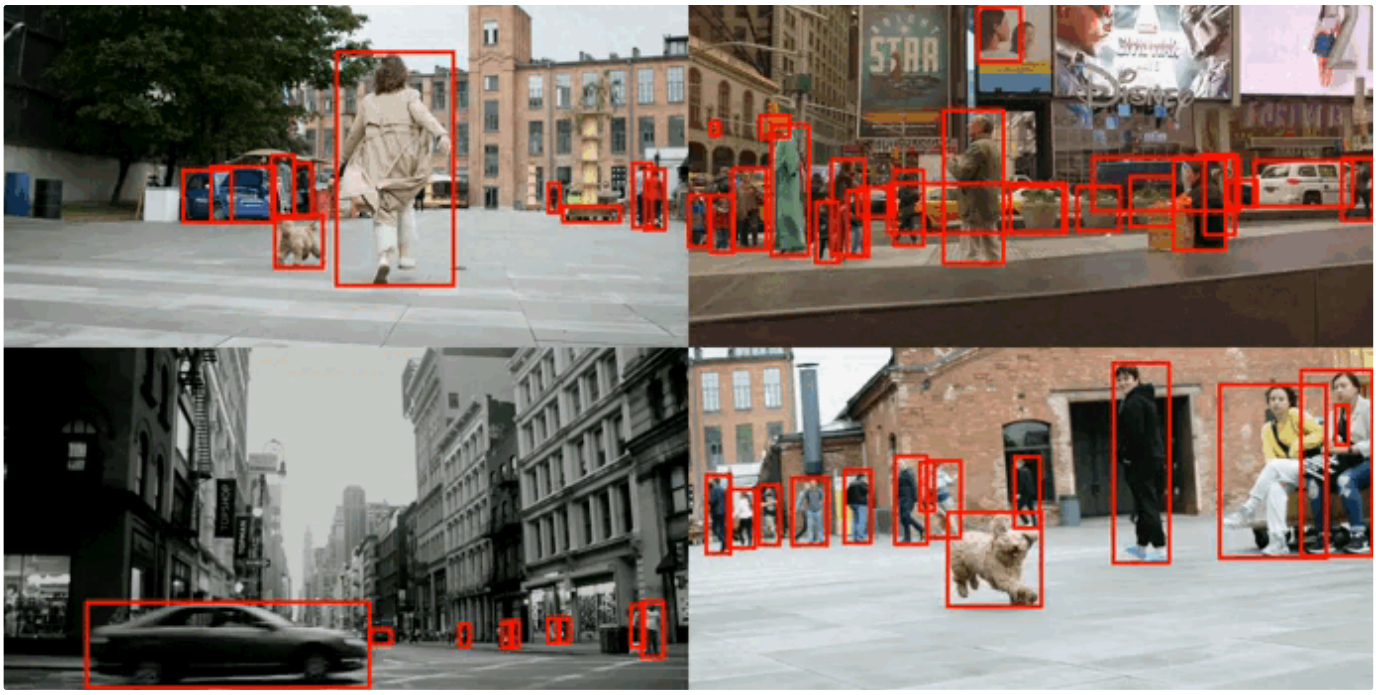
Station2Station

Use this tool as a script (1274_GoogleDirForm2GeocodeDirectionsGeneral2request62.pas) to get the directions between any point using google...

Oct 2 34

See all from Max Kleiner

Recommended from Medium

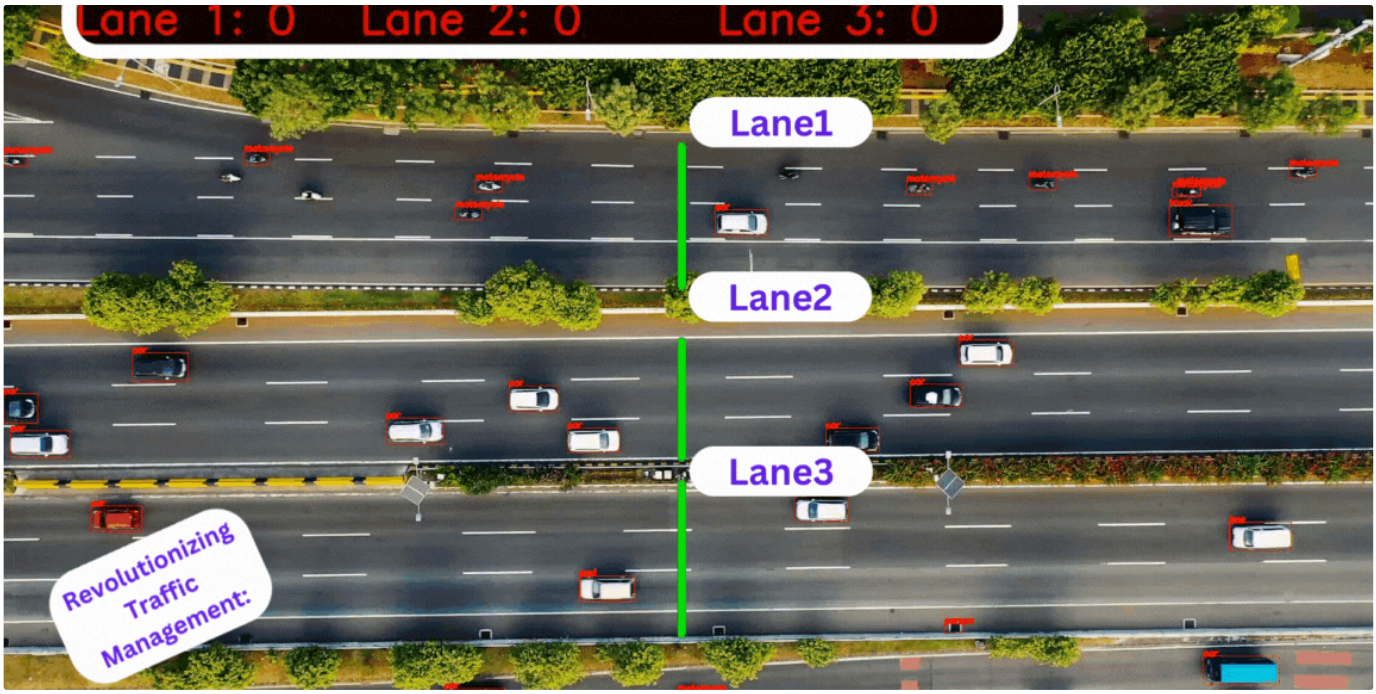


siromer

Multistream YOLO Object Detection with NVIDIA DeepStream

Object detection with multiple streams is important for tasks like security cameras, traffic management, industrial automation, monitoring...

Dec 4 4



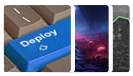
Sunny Kumar

deepsort and yolo for object tracking and object counting.

DeepSORT (Deep Simple Online and Realtime Tracking) and YOLO (You Only Look Once) are commonly paired for real-time object tracking and...

Nov 11 3

Lists



Predictive Modeling w/ Python

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Practical Guides to Machine Learning

10 stories · 2091 saves

Natural Language Processing

1857 stories · 1486 saves

The New Chatbots: ChatGPT, Bard, and Beyond

12 stories · 524 saves

In Rectlabs Inc by Bolarinwa Oreoluwa

Applying Computer Vision to Basketball— Part 3 (Team Detection, Object Tracking Using DeepSort).

In my previous article I went through custom instance segmentation of basketball courts and also applied the results to better the player...

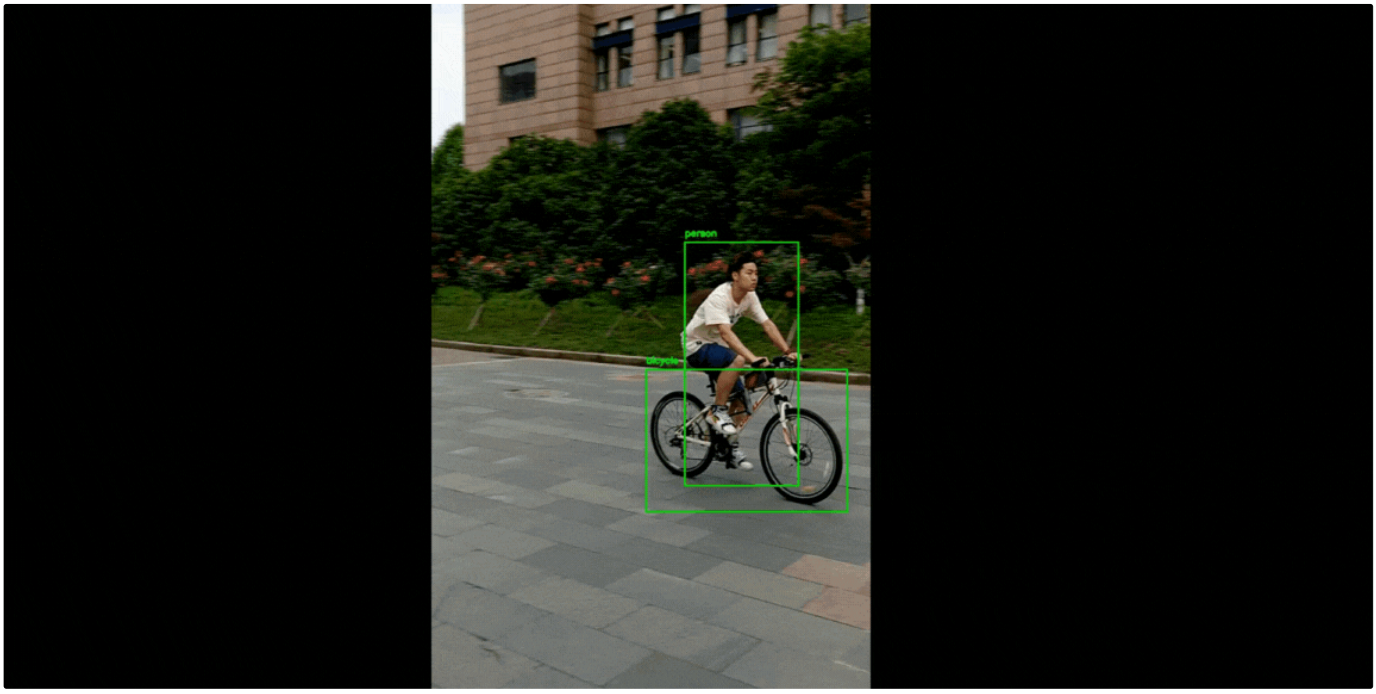
Nov 23 1

Muhammad Rizwan Munawar

Ultralytics YOLO11: Object Detection and Instance Segmentation 🤯

YOLO11 is not just better at detecting objects but also adds advanced features like image segmentation, pose estimation, object tracking...

Oct 27 8



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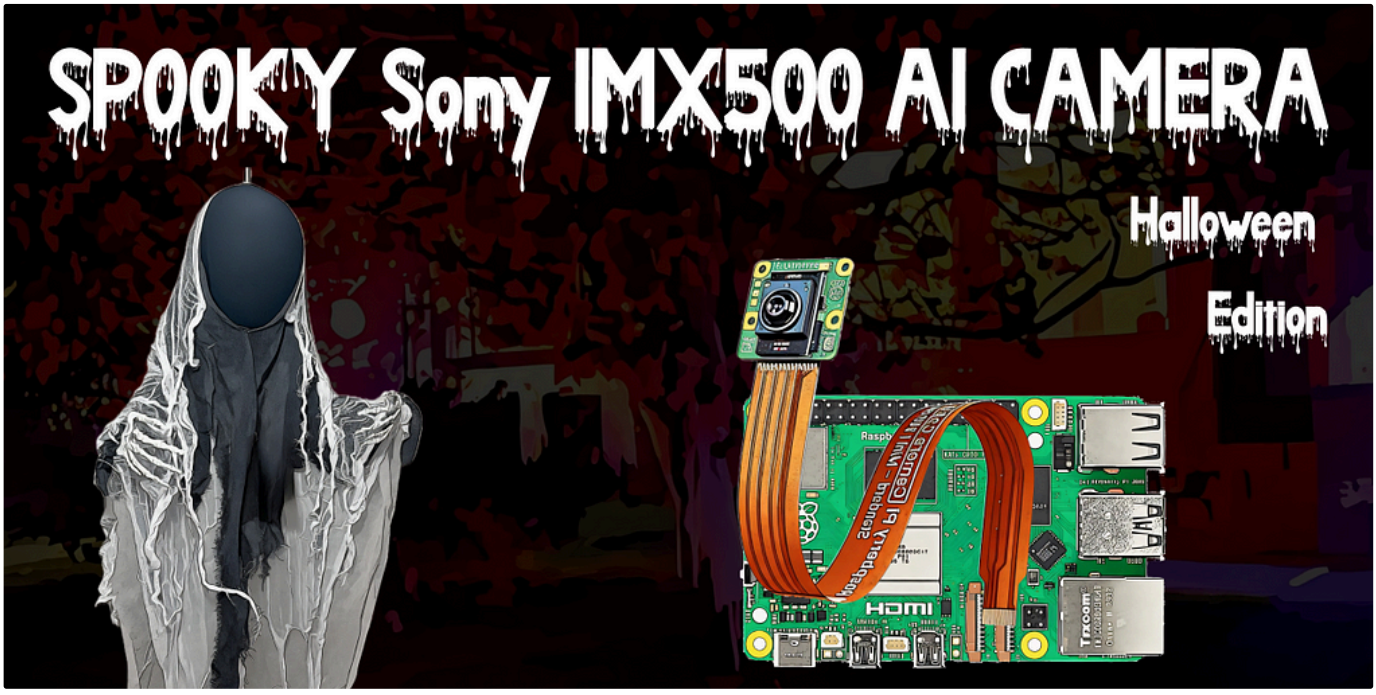
Part XI: Vehicle Detection Using OpenCV and Deep Learning

In self-driving cars, understanding object detection is crucial. Object detection involves both classifying objects and localizing them. In...

Nov 11 100



In AI Advances by Eugene Tkachenko

Raspberry Pi, AI Camera, SONY IMX500 Object detection for a Halloween project.

I used Raspberry PI and a new AI Camera, Sony IMX500, to scare people on Halloween: it's a technologically Spooky Season!

See more recommendations