**PROIECT PRELUCRAREA IMAGINILOR**

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1. **Scurta prezentare a aplicatiei**

Aplicatia este alcatuita din 2 clase : Main.class si ModicareaImaginilor.class.

In clasa Main avem apelul functiilor, iar in clasa ModificareaImaginilor avem implementarea acestora.

Functiile din clasa Main sunt LoadImage(), SaveImage(), GreyScale(), Negativ(), GreyScaleToBinary(), RGBToHSV().

Functiile LoadImage() si SaveImage() sunt folosite pentru citirea si afisarea imaginii care urmeaza a fi prelucrata, iar celelalte sunt functii modifica imaginea initiala in functie de context.

1. **Soft-ul folosit**

Am folosit Java si biblioteca OpenCV dupa ce am urmat instructiunile din laboratoul 1

1. **Citirea si afisarea imaginii**

**Citirea** – am realizat-o in functia LoadImage()

**public** **void** LoadImage() {

Mat matrix = imageCodecs.*imread*(file);

System.***out***.println("Imagine incarcata.............");

}

**Scrierea** – am realizat-o in functia SaveImage()

**public** **void** SaveImage() {

System.***out***.println("Imagine incarcata.............");

String file2 ="D:/imaginePrimavara\_resalvata.jpg";

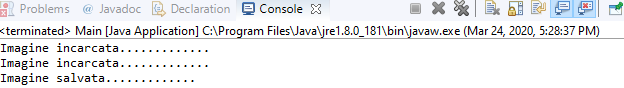
Mat matrix = imageCodecs.*imread*(file);

imageCodecs.*imwrite*(file2,matrix);

System.***out***.println("Imagine salvata.............");

}

In urma executarii celor 2 functii se afiseaza:



Imaginea initiala: Imaginea resalvata:

1. **Negativarea imaginii**

**public** **void** Negativ() {

System.***out***.println("Imagine incarcata.............");

String file2 ="D:/imaginePrimavara\_negativa.jpg";

Mat matrix = imageCodecs.*imread*(file);

Mat matrix2 = imageCodecs.*imread*(file2);

Mat invertcolormatrix = **new** Mat(matrix.rows(),matrix.cols(),matrix.type(),**new** Scalar(255,255,255));

Core.*subtract*(invertcolormatrix, matrix, matrix2);

imageCodecs.*imwrite*(file2,matrix2);

System.***out***.println("Imagine salvata.............");

}

Imaginea procesata: Imaginea initiala:

1. **Conversia GreyScale**

**public** **void** GrayScale() {

System.***out***.println("Imagine incarcata.............");

String file2 ="D:/imaginePrimavara\_greyScale.jpg";

Mat matrix = imageCodecs.*imread*(file);

Mat matrix2 = imageCodecs.*imread*(file2);

Imgproc.*cvtColor*(matrix, matrix2, Imgproc.***COLOR\_RGB2GRAY***);

imageCodecs.*imwrite*(file2, matrix2);

System.***out***.println("Imagine salvata.............");

}

Imaginea procesata: Imaginea initiala:

**Conversia GreyScaleToBinary**

**public** **void** GrayScaleToBinary() {

System.***out***.println("Imagine incarcata.............");

String file2 ="D:/imaginePrimavara\_greyScale.jpg";

String file3 ="D:/imaginePrimavara\_GrayScaleToBinary.jpg";

Mat matrix = imageCodecs.*imread*(file2);

Mat matrix2 = imageCodecs.*imread*(file3);

Imgproc.*threshold*(matrix, matrix2, 200, 500, Imgproc.***THRESH\_BINARY***);

imageCodecs.*imwrite*(file3, matrix2);

System.***out***.println("Imagine salvata.............");

}

Imaginea procesata: Imaginea initiala:

**Conversia RBG-HSV**

**public** **void** RGBToHSV() {

System.***out***.println("Imagine incarcata.............");

String file2 ="D:/imaginePrimavara\_RGBToHSV.jpg";

Mat matrix = imageCodecs.*imread*(file);

Mat matrix2 = imageCodecs.*imread*(file2);

Imgproc.*cvtColor*(matrix, matrix2, Imgproc.***COLOR\_RGB2HSV***);

imageCodecs.*imwrite*(file2, matrix2);

System.***out***.println("Imagine salvata.............");

}

Imaginea procesata: Imaginea initiala:

1. Histograma unei imagini- Algoritmul Floyd-Steinberg

**public** **void** histogram() {

String file ="D:/imaginePrimavara.jpg";

Mat img = Imgcodecs.*imread*(file);

Mat equ = **new** Mat();

img.copyTo(equ);

Imgproc.*blur*(equ, equ, **new** Size(3, 3));

Imgproc.*cvtColor*(equ, equ, Imgproc.***COLOR\_BGR2YCrCb***);

ArrayList<Mat> channels = **new** ArrayList<Mat>();

Core.*split*(equ, channels);

Imgproc.*equalizeHist*(channels.get(0), channels.get(0));

Core.*merge*(channels, equ);

Imgproc.*cvtColor*(equ, equ, Imgproc.***COLOR\_YCrCb2BGR***);

Mat gray = **new** Mat();

Imgproc.*cvtColor*(equ, gray, Imgproc.***COLOR\_BGR2GRAY***);

Mat grayOrig = **new** Mat();

Imgproc.*cvtColor*(img, grayOrig, Imgproc.***COLOR\_BGR2GRAY***);

Imgcodecs.*imwrite*("D:/imaginePrimavara\_histograma.jpg", equ);

System.***out***.println("Imagine Procesata……………");

}

Imaginea procesata: Imaginea initiala:

** **

Main.class :

**import** org.opencv.core.Core;

**public** **class** Main {

**public** **static** **void** main(String args[]) {

System.*loadLibrary*(Core.***NATIVE\_LIBRARY\_NAME***);

ModificareaImaginilor img = **new** ModificareaImaginilor();

img.LoadImage();

img.SaveImage();

img.GrayScale();

img.Negativ();

img.GrayScaleToBinary();

img.RGBToHSV();

img.histogram();

}

}

ModificareaImaginilor.class :

**import** java.awt.List;

**import** java.util.ArrayList;

**import** org.opencv.core.Core;

**import** org.opencv.core.Mat;

**import** org.opencv.core.Scalar;

**import** org.opencv.core.Size;

**import** org.opencv.imgcodecs.Imgcodecs;

**import** org.opencv.imgproc.Imgproc;

**public** **class** ModificareaImaginilor {

Imgcodecs imageCodecs = **new** Imgcodecs();

String file ="D:/imaginePrimavara.jpg";

**public** **void** LoadImage() {

Mat matrix = imageCodecs.*imread*(file);

System.***out***.println("Imagine incarcata.............");

}

**public** **void** SaveImage() {

System.***out***.println("Imagine incarcata.............");

String file2 ="D:/imaginePrimavara\_resalvata.jpg";

Mat matrix = imageCodecs.*imread*(file);

imageCodecs.*imwrite*(file2,matrix);

System.***out***.println("Imagine salvata.............");

}

**public** **void** GrayScale() {

System.***out***.println("Imagine incarcata.............");

String file2 ="D:/imaginePrimavara\_greyScale.jpg";

Mat matrix = imageCodecs.*imread*(file);

Mat matrix2 = imageCodecs.*imread*(file2);

Imgproc.*cvtColor*(matrix, matrix2, Imgproc.***COLOR\_RGB2GRAY***);

imageCodecs.*imwrite*(file2, matrix2);

System.***out***.println("Imagine salvata.............");

}

**public** **void** Negativ() {

System.***out***.println("Imagine incarcata.............");

String file2 ="D:/imaginePrimavara\_negativa.jpg";

Mat matrix = imageCodecs.*imread*(file);

Mat matrix2 = imageCodecs.*imread*(file2);

Mat invertcolormatrix = **new** Mat(matrix.rows(),matrix.cols(),matrix.type(),**new** Scalar(255,255,255));

Core.*subtract*(invertcolormatrix, matrix, matrix2);

imageCodecs.*imwrite*(file2,matrix2);

System.***out***.println("Imagine salvata.............");

}

**public** **void** RGBToHSV() {

System.***out***.println("Imagine incarcata.............");

String file2 ="D:/imaginePrimavara\_RGBToHSV.jpg";

Mat matrix = imageCodecs.*imread*(file);

Mat matrix2 = imageCodecs.*imread*(file2);

Imgproc.*cvtColor*(matrix, matrix2, Imgproc.***COLOR\_RGB2HSV***);

imageCodecs.*imwrite*(file2, matrix2);

System.***out***.println("Imagine salvata.............");

}

**public** **void** GrayScaleToBinary() {

System.***out***.println("Imagine incarcata.............");

String file2 ="D:/imaginePrimavara\_greyScale.jpg";

String file3 ="D:/imaginePrimavara\_GrayScaleToBinary.jpg";

Mat matrix = imageCodecs.*imread*(file2);

Mat matrix2 = imageCodecs.*imread*(file3);

Imgproc.*threshold*(matrix, matrix2, 200, 500, Imgproc.***THRESH\_BINARY***);

imageCodecs.*imwrite*(file3, matrix2);

System.***out***.println("Imagine salvata.............");

}

**public** **void** histogram() {

String file ="D:/imaginePrimavara.jpg";

Mat img = Imgcodecs.*imread*(file);

Mat equ = **new** Mat();

img.copyTo(equ);

Imgproc.*blur*(equ, equ, **new** Size(3, 3));

Imgproc.*cvtColor*(equ, equ, Imgproc.***COLOR\_BGR2YCrCb***);

ArrayList<Mat> channels = **new** ArrayList<Mat>();

Core.*split*(equ, channels);

Imgproc.*equalizeHist*(channels.get(0), channels.get(0));

Core.*merge*(channels, equ);

Imgproc.*cvtColor*(equ, equ, Imgproc.***COLOR\_YCrCb2BGR***);

Mat gray = **new** Mat();

Imgproc.*cvtColor*(equ, gray, Imgproc.***COLOR\_BGR2GRAY***);

Mat grayOrig = **new** Mat();

Imgproc.*cvtColor*(img, grayOrig, Imgproc.***COLOR\_BGR2GRAY***);

Imgcodecs.*imwrite*("D:/imaginePrimavara\_histograma.jpg", equ);

System.***out***.println("Image Procesata");

}

}

SFARSIT!