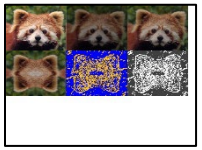
Nolan Sterns

Completed



Original

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from jes4py import *
#nolan sterns - 3/23/25

def Collage():
    canvas = makeEmptyPicture(1000, 736, white)
    picture = makePicture(getMediaPath("red panda.jpg"))
    #scaled_pic = scale(picture)
    collage(picture, canvas)

    blurry = blur(picture)
    collage2(blurry, canvas)

    dark_pic = darken(picture)
    collage3(dark_pic, canvas)

    mirrored = mirrorPicture(picture)
    collage4(mirrored, canvas)

    edge_detected = edgeDetect(picture, 5)
    collage5(edge_detected, canvas)

    posterized = posterize(picture)
    collage6(posterized, canvas)

    explore(canvas)

def scale(picture):
    new_width = getWidth(picture) // 2
    new_height = getHeight(picture) // 2
    small_picture = makeEmptyPicture(new_width, new_height)
    source_x = 0
    for new_x in range(0,getWidth(small_picture)):
        source_y = 0
        for new_y in range(0,getHeight(small_picture)):
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            color = getColor(getPixel(picture, source_x, source_y))
            setColor(getPixel(small_picture, new_x, new_y), color)
            source_y = source_y + 2
        source_x = source_x + 2
    return small_picture

def collage(scaled_pic, canvas):
    width = getWidth(scaled_pic)
    height = getHeight(scaled_pic)
    for x in range(0, width):
        for y in range(0, height):
            pixel = getPixel(scaled_pic, x, y)
            pixel2 = getPixel(canvas, x, y)
            color = getColor(pixel)
            setColor(pixel2, color)

def collage2(scaled_pic, canvas):
    width = getWidth(scaled_pic)
    height = getHeight(scaled_pic)
    for x in range(0, width):
        for y in range(0, height):
            pixel = getPixel(scaled_pic, x, y)
            pixel2 = getPixel(canvas, x + width, y)
            color = getColor(pixel)
            setColor(pixel2, color)

def collage3(scaled_pic, canvas):
    width = getWidth(scaled_pic)
    height = getHeight(scaled_pic)
    for x in range(0, width):
        for y in range(0, height):
            pixel = getPixel(scaled_pic, x, y)
            pixel2 = getPixel(canvas, x + (width * 2), y)
            color = getColor(pixel)
            setColor(pixel2, color)

def collage4(scaled_pic, canvas):
    width = getWidth(scaled_pic)
    height = getHeight(scaled_pic)
    for x in range(0, width):
        for y in range(0, height):
            pixel = getPixel(scaled_pic, x, y)
            pixel2 = getPixel(canvas, x, y + height)
            color = getColor(pixel)
            setColor(pixel2, color)
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def collage5(scaled_pic, canvas):
    width = getWidth(scaled_pic)
    height = getHeight(scaled_pic)
    for x in range(0, width):
        for y in range(0, height):
            pixel = getPixel(scaled_pic, x, y)
            pixel2 = getPixel(canvas, x + width, y + height)
            color = getColor(pixel)
            setColor(pixel2, color)

def collage6(scaled_pic, canvas):
    width = getWidth(scaled_pic)
    height = getHeight(scaled_pic)
    for x in range(0, width):
        for y in range(0, height):
            pixel = getPixel(scaled_pic, x, y)
            pixel2 = getPixel(canvas, x + (width * 2), y + height)
            color = getColor(pixel)
            setColor(pixel2, color)

def blur(scaled_pic):
    blur_picture = duplicatePicture(scaled_pic)
    for x in range(1, getWidth(scaled_pic) - 1):
        for y in range(1, getHeight(scaled_pic) - 1):

            center = getPixel(blur_picture, x, y)

            left = getPixel(scaled_pic, x - 1, y)
            right = getPixel(scaled_pic, x + 1, y)
            top = getPixel(scaled_pic, x, y - 1)
            bottom = getPixel(scaled_pic, x, y + 1)

            new_red = (getRed(center) + getRed(left) + getRed(right) + getRed(top) + getRed(bottom)) // 10
            new_green = (getGreen(center) + getGreen(left) + getGreen(right)+getGreen(top)+getGreen(bottom)) // 10
            new_blue = (getBlue(center) + getBlue(left) + getBlue(right) + getBlue(top) + getBlue(bottom)) // 10

            setColor(center, makeColor(new_red, new_green, new_blue))
    return blur_picture

def posterize(scaled_pic):
    for pixel in getPixels(scaled_pic):
        red_value = getRed(pixel)
        green_value = getGreen(pixel)
        blue_value = getBlue(pixel)
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        luminance = (red_value + green_value + blue_value) // 3
        if luminance <= 50:
            setColor(pixel, black)
        elif luminance > 50 and luminance <= 150:
            setColor(pixel, darkGray)
        elif luminance > 151 and luminance <= 200:
            setColor(pixel, lightGray)
        else:
            setColor(pixel, white)
    return scaled_pic

def luminance(pixel):
    red_value = getRed(pixel)
    green_value = getGreen(pixel)
    blue_value = getBlue(pixel)
    return (red_value + green_value + blue_value) // 3

def edgeDetect(scaled_pic, threshold):
    for pixel in getPixels(scaled_pic):
        x = getX(pixel)
        y = getY(pixel)
        if y < getHeight(scaled_pic) - 1 and x < getWidth(scaled_pic) - 1:
            bottom_right_pixel = getPixel(scaled_pic, x+1, y+1)
            this_luminance = luminance(pixel)
            bottom_right_luminance = luminance(bottom_right_pixel)
            if abs(bottom_right_luminance - this_luminance) > threshold:
                setColor(pixel, orange)
            else:
                setColor(pixel, blue)
    return scaled_pic

def mirrorPicture(scaled_pic):
    width = getWidth(scaled_pic)
    height = getHeight(scaled_pic)

    mirror_point_v = width // 2
    for x in range(mirror_point_v):
        for y in range(height):
            left_pixel = getPixel(scaled_pic, x, y)
            right_pixel = getPixel(scaled_pic, width - x - 1, y)
            color = getColor(left_pixel)
            setColor(right_pixel, color)

    mirror_point_h = height // 2
    for x in range(width):
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        for y in range(mirror_point_h):
            top_pixel = getPixel(scaled_pic, x, y)
            bottom_pixel = getPixel(scaled_pic, x, height - y - 1)
            color = getColor(top_pixel)
            setColor(bottom_pixel, color)
    return scaled_pic

def darken(scaled_pic):
    for x in range(getWidth(scaled_pic) // 2, getWidth(scaled_pic)):
        for y in range(0, getHeight(scaled_pic)):
            pixel = getPixel(scaled_pic, x, y)
            color = getColor(pixel)
            color = makeDarker(color)
            setColor(pixel, color)
    for x in range(0, getWidth(scaled_pic) // 2):
        for y in range(0,getHeight(scaled_pic)):
            pixel = getPixel(scaled_pic, x, y)
            color = getColor(pixel)
            color = makeDarker(color)
            setColor(pixel, color)
    return scaled_pic
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