Noa Kosman

Completed

Original

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# Name: Noa Maj Kosman
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from mediaComp import *

# Main Function
def collage():
    whiteFlower = makePicture(getMediaFolder("whiteFlower.jpg"))  # Use your function
    canvas_width = 736
    canvas_height = 1000
    cols = 3
    rows = 6
    tile_w = canvas_width // cols
    tile_h = canvas_height // rows

    canvas = makeEmptyPicture(canvas_width, canvas_height)

    small_original = scalePicture(whiteFlower, tile_w, tile_h)
    small_gray = makeGrayscale(small_original)
    small_poster = posterize(small_original)
    small_blue = blueTint(small_original)
    small_custom = colorShiftSpiral(small_original)
    tiles = [small_original, small_gray, small_poster, small_blue, small_custom]

    for row in range(rows):
        for col in range(cols):
            tile_img = tiles[(row * cols + col) % len(tiles)]
            x = col * tile_w
            y = row * tile_h
            copyPicture(tile_img, canvas, x, y)

    signature = makePicture(getMediaFolder("Signature2.jpg"))
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    signature = scalePicture(signature, 250, 120)
    reverseChromakey(canvas, signature, pos_x=430, pos_y=canvas_height - 710, sign_color=(255, 0, 0))

    show(canvas)

# --- Supporting Functions ---

def scalePicture(pic, new_width, new_height):
    scaled = makeEmptyPicture(new_width, new_height)
    orig_w = getWidth(pic)
    orig_h = getHeight(pic)
    for x in range(new_width):
        for y in range(new_height):
            src_x = (x * orig_w) // new_width
            src_y = (y * orig_h) // new_height
            src_pixel = getPixelAt(pic, src_x, src_y)
            r = getRed(src_pixel)
            g = getGreen(src_pixel)
            b = getBlue(src_pixel)
            dest_pixel = getPixelAt(scaled, x, y)
            setRed(dest_pixel, r)
            setGreen(dest_pixel, g)
            setBlue(dest_pixel, b)
    return scaled

def copyPicture(source, dest, start_x, start_y):
    src_w = getWidth(source)
    src_h = getHeight(source)
    dest_w = getWidth(dest)
    dest_h = getHeight(dest)
    for x in range(src_w):
        for y in range(src_h):
            dest_x = start_x + x
            dest_y = start_y + y
            if dest_x < dest_w and dest_y < dest_h:
                src_pixel = getPixelAt(source, x, y)
                r = getRed(src_pixel)
                g = getGreen(src_pixel)
                b = getBlue(src_pixel)
                dest_pixel = getPixelAt(dest, dest_x, dest_y)
                setRed(dest_pixel, r)
                setGreen(dest_pixel, g)
                setBlue(dest_pixel, b)
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def makeGrayscale(pic):
    copy = duplicatePicture(pic)
    w = getWidth(copy)
    h = getHeight(copy)
    for x in range(w):
        for y in range(h):
            p = getPixelAt(copy, x, y)
            r = getRed(p)
            g = getGreen(p)
            b = getBlue(p)
            gray = (r + g + b) // 3
            setRed(p, gray)
            setGreen(p, gray)
            setBlue(p, gray)
    return copy

def posterize(pic):
    copy = duplicatePicture(pic)

    def quantize(c):
        if c < 43:
            return 0
        elif c < 128:
            return 85
        elif c < 213:
            return 170
        else:
            return 255

    for pixel in getPixels(copy):
        r = quantize(getRed(pixel))
        g = quantize(getGreen(pixel))
        b = quantize(getBlue(pixel))
        setRed(pixel, r)
        setGreen(pixel, g)
        setBlue(pixel, b)

    return copy

def blueTint(pic):
    copy = duplicatePicture(pic)
    w = getWidth(copy)
    h = getHeight(copy)
    for x in range(w):
        for y in range(h):
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            p = getPixelAt(copy, x, y)
            r = getRed(p) // 3
            g = getGreen(p) // 3
            b = getBlue(p)
            setRed(p, r)
            setGreen(p, g)
            setBlue(p, b)
    return copy

# Custom Modification
def colorShiftSpiral(pic):
    copy = duplicatePicture(pic)
    w = getWidth(copy)
    h = getHeight(copy)
    cx = w // 2
    cy = h // 2

    for x in range(w):
        for y in range(h):
            p = getPixelAt(copy, x, y)
            r = getRed(p)
            g = getGreen(p)
            b = getBlue(p)

            # Calculate distance from center
            dx = x - cx
            dy = y - cy
            dist = int((dx*dx + dy*dy) ** 0.5)

            # Shift amount cycles every 30 pixels of distance
            shift = (dist // 30) % 3

            # Rotate channels based on shift
            if shift == 0:
                nr, ng, nb = r, g, b
            elif shift == 1:
                nr, ng, nb = g, b, r
            else:
                nr, ng, nb = b, r, g

            setRed(p, nr)
            setGreen(p, ng)
            setBlue(p, nb)
    return copy
```

```
def duplicatePicture(pic):
    w = getWidth(pic)
    h = getHeight(pic)
    copy = makeEmptyPicture(w, h)
    for x in range(w):
        for y in range(h):
            src = getPixelAt(pic, x, y)
            r = getRed(src)
            g = getGreen(src)
            b = getBlue(src)
            dst = getPixelAt(copy, x, y)
            setRed(dst, r)
            setGreen(dst, g)
            setBlue(dst, b)
    return copy

# Signature Function
def reverseChromakey(collage_pic, signature_pic, pos_x, pos_y, sign_color=(0, 0, 0)):
    sig_w = getWidth(signature_pic)
    sig_h = getHeight(signature_pic)
    coll_w = getWidth(collage_pic)
    coll_h = getHeight(collage_pic)

    for x in range(sig_w):
        for y in range(sig_h):
            sig_pixel = getPixelAt(signature_pic, x, y)
            r = getRed(sig_pixel)
            g = getGreen(sig_pixel)
            b = getBlue(sig_pixel)

            if r < 250 or g < 250 or b < 250:
                coll_x = pos_x + x
                coll_y = pos_y + y
                if 0 <= coll_x < coll_w and 0 <= coll_y < coll_h:
                    coll_pixel = getPixelAt(collage_pic, coll_x, coll_y)
                    setRed(coll_pixel, sign_color[0])
                    setGreen(coll_pixel, sign_color[1])
                    setBlue(coll_pixel, sign_color[2])
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