import numpy as np

import matplotlib.pyplot as plt

from tensorflow.keras.preprocessing.image import img\_to\_array

from PIL import Image, ImageEnhance

import cv2

# Load your image

img\_path = '/content/pexels-mikhail-nilov-7709022.jpg'

img = Image.open(img\_path).resize((224, 224))

# Convert to NumPy array

x = img\_to\_array(img)

# Create specific augmentations

augmented\_images = {

    "Original": img,

    "Rotated\_40": img.rotate(40),

    "Flipped\_Horizontally": img.transpose(Image.FLIP\_LEFT\_RIGHT),

    "Flipped\_Vertically": img.transpose(Image.FLIP\_TOP\_BOTTOM),

    "Zoomed\_In": img.crop((30, 30, 194, 194)).resize((224, 224)),

    "Shifted\_Right": img.transform((224, 224), Image.AFFINE, (1, 0, 30, 0, 1, 0)),

    "Shifted\_Down": img.transform((224, 224), Image.AFFINE, (1, 0, 0, 0, 1, 30)),

    "Brightened": ImageEnhance.Brightness(img).enhance(1.8),

    "Darkened": ImageEnhance.Brightness(img).enhance(0.4)

}

# Display all with labels

plt.figure(figsize=(12, 12))

for i, (name, aug\_img) in enumerate(augmented\_images.items()):

    plt.subplot(3, 3, i + 1)

    plt.imshow(aug\_img)

    plt.title(name, fontsize=10)

    plt.axis('off')

plt.suptitle("Named Data Augmentation Variations", fontsize=16)

plt.tight\_layout()

plt.show()





