

Package ‘torchvision’

April 14, 2023

Title Models, Datasets and Transformations for Images

Version 0.5.1

Description Provides access to datasets, models and preprocessing facilities for deep learning with images. Integrates seamlessly with the 'torch' package and it's 'API' borrows heavily from 'PyTorch' vision package.

License MIT + file LICENSE

Encoding UTF-8

URL <https://torchvision.mlverse.org>,
<https://github.com/mlverse/torchvision>

RoxygenNote 7.2.3

Imports torch (>= 0.5.0), fs, rlang, rappdirs, utils, jpeg, magrittr, png, abind, withr

Suggests magick, testthat, coro, zip

NeedsCompilation no

Author Daniel Falbel [aut, cre],
Christophe Regouby [ctb],
RStudio [cph]

Maintainer Daniel Falbel <daniel@rstudio.com>

Repository CRAN

Date/Publication 2023-04-14 10:00:02 UTC

R topics documented:

base_loader	3
cifar10_dataset	3
draw_bounding_boxes	4
draw_keypoints	5
draw_segmentation_masks	6
image_folder_dataset	7
kmnist_dataset	8

magick_loader	8
mnist_dataset	9
model_alexnet	9
model_inception_v3	10
model_mobilenet_v2	11
model_resnet	11
model_vgg	12
tensor_image_browse	13
tensor_image_display	14
tiny_imagenet_dataset	14
transform_adjust_brightness	15
transform_adjust_contrast	15
transform_adjust_gamma	16
transform_adjust_hue	17
transform_adjust_saturation	18
transform_affine	19
transform_center_crop	20
transform_color_jitter	21
transform_convert_image_dtype	22
transform_crop	22
transform_five_crop	23
transform_grayscale	24
transform_hflip	25
transform_linear_transformation	25
transform_normalize	26
transform_pad	27
transform_perspective	28
transform_random_affine	29
transform_random_apply	30
transform_random_choice	31
transform_random_crop	32
transform_random_erasing	33
transform_random_grayscale	34
transform_random_horizontal_flip	35
transform_random_order	35
transform_random_perspective	36
transform_random_resized_crop	37
transform_random_rotation	38
transform_random_vertical_flip	39
transform_resize	40
transform_resized_crop	41
transform_rgb_to_grayscale	42
transform_rotate	42
transform_ten_crop	43
transform_to_tensor	44
transform_vflip	45
vision_make_grid	46
Index	47

base_loader	<i>Base loader</i>
-------------	--------------------

Description

Loads an image using jpeg, or png packages depending on the file extension.

Usage

```
base_loader(path)
```

Arguments

path	path to the image to load from
------	--------------------------------

cifar10_dataset	<i>Cifar datasets</i>
-----------------	-----------------------

Description

CIFAR10 Dataset.

Downloads and prepares the CIFAR100 dataset.

Usage

```
cifar10_dataset(  
    root,  
    train = TRUE,  
    transform = NULL,  
    target_transform = NULL,  
    download = FALSE  
)
```

```
cifar100_dataset(  
    root,  
    train = TRUE,  
    transform = NULL,  
    target_transform = NULL,  
    download = FALSE  
)
```

Arguments

root	(string): Root directory of dataset where directory cifar-10-batches-bin exists or will be saved to if download is set to TRUE.
train	(bool, optional): If TRUE, creates dataset from training set, otherwise creates from test set.
transform	(callable, optional): A function/transform that takes in an PIL image and returns a transformed version. E.g, transforms.RandomCrop
target_transform	(callable, optional): A function/transform that takes in the target and transforms it.
download	(bool, optional): If true, downloads the dataset from the internet and puts it in root directory. If dataset is already downloaded, it is not downloaded again.

draw_bounding_boxes *Draws bounding boxes on image.*

Description

Draws bounding boxes on top of one image tensor

Usage

```
draw_bounding_boxes(
    image,
    boxes,
    labels = NULL,
    colors = NULL,
    fill = FALSE,
    width = 1,
    font = c("serif", "plain"),
    font_size = 10
)
```

Arguments

image	: Tensor of shape (C x H x W) and dtype uint8.
boxes	: Tensor of size (N, 4) containing bounding boxes in (xmin, ymin, xmax, ymax) format. Note that the boxes are absolute coordinates with respect to the image. In other words: $0 \leq \text{xmin} < \text{xmax} < W$ and $0 \leq \text{ymin} < \text{ymax} < H$.
labels	: character vector containing the labels of bounding boxes.
colors	: character vector containing the colors of the boxes or single color for all boxes. The color can be represented as strings e.g. "red" or "#FF00FF". By default, viridis colors are generated for boxes.
fill	: If TRUE fills the bounding box with specified color.

width : Width of text shift to the bounding box.

font : NULL for the current font family, or a character vector of length 2 for Hershey vector fonts.

font_size : The requested font size in points.

Value

torch_tensor of size (C, H, W) of dtype uint8: Image Tensor with bounding boxes plotted.

Examples

```
if (torch::torch_is_installed()) {
  image <- torch::torch_randint(170, 250, size = c(3, 360, 360))$to(torch::torch_uint8())
  x <- torch::torch_randint(low = 1, high = 160, size = c(12,1))
  y <- torch::torch_randint(low = 1, high = 260, size = c(12,1))
  boxes <- torch::torch_cat(c(x, y, x + 20, y + 10), dim = 2)
  bboxed <- draw_bounding_boxes(image, boxes, colors = "black", fill = TRUE)
  tensor_image_browse(bboxed)
}
```

draw_keypoints	<i>Draws Keypoints</i>
----------------	------------------------

Description

Draws Keypoints, an object describing a body part (like rightArm or leftShoulder), on given RGB tensor image.

Usage

```
draw_keypoints(
  image,
  keypoints,
  connectivity = NULL,
  colors = NULL,
  radius = 2,
  width = 3
)
```

Arguments

image : Tensor of shape (3, H, W) and dtype uint8

keypoints : Tensor of shape (N, K, 2) the K keypoints location for each of the N detected poses instance,

connectivity : Vector of pair of keypoints to be connected (currently unavailable)

colors : character vector containing the colors of the boxes or single color for all boxes. The color can be represented as strings e.g. "red" or "#FF00FF". By default, viridis colors are generated for keypoints
radius : radius of the plotted keypoint.
width : width of line connecting keypoints.

Value

Image Tensor of dtype uint8 with keypoints drawn.

Examples

```

if (torch::torch_is_installed()) {
  image <- torch::torch_randint(190, 255, size = c(3, 360, 360))$to(torch::torch_uint8())
  keypoints <- torch::torch_randint(low = 60, high = 300, size = c(4, 5, 2))
  keypoint_image <- draw_keypoints(image, keypoints)
  tensor_image_browse(keypoint_image)
}
  
```

draw_segmentation_masks

Draw segmentation masks

Description

Draw segmentation masks with their respective colors on top of a given RGB tensor image

Usage

```
draw_segmentation_masks(image, masks, alpha = 0.8, colors = NULL)
```

Arguments

image : torch_tensor of shape (3, H, W) and dtype uint8.
masks : torch_tensor of shape (num_masks, H, W) or (H, W) and dtype bool.
alpha : number between 0 and 1 denoting the transparency of the masks.
colors : character vector containing the colors of the boxes or single color for all boxes. The color can be represented as strings e.g. "red" or "#FF00FF". By default, viridis colors are generated for masks

Value

torch_tensor of shape (3, H, W) and dtype uint8 of the image with segmentation masks drawn on top.

Examples

```
if (torch::torch_is_installed()) {  
  image <- torch::torch_randint(170, 250, size = c(3, 360, 360))$to(torch::torch_uint8())  
  mask <- torch::torch_tril(torch::torch_ones(c(360, 360)))$to(torch::torch_bool())  
  masked_image <- draw_segmentation_masks(image, mask, alpha = 0.2)  
  tensor_image_browse(masked_image)  
}
```

image_folder_dataset *Create an image folder dataset*

Description

A generic data loader for images stored in folders. See [Details](#) for more information.

Usage

```
image_folder_dataset(  
  root,  
  transform = NULL,  
  target_transform = NULL,  
  loader = NULL,  
  is_valid_file = NULL  
)
```

Arguments

root	Root directory path.
transform	A function/transform that takes in an PIL image and returns a transformed version. E.g, transform_random_crop() .
target_transform	A function/transform that takes in the target and transforms it.
loader	A function to load an image given its path.
is_valid_file	A function that takes path of an Image file and check if the file is a valid file (used to check of corrupt files)

Details

This function assumes that the images for each class are contained in subdirectories of root. The names of these subdirectories are stored in the `classes` attribute of the returned object.

An example folder structure might look as follows:

```
root/dog/xxx.png  
root/dog/xyy.png  
root/dog/xxz.png
```

```

root/cat/123.png
root/cat/nsdf3.png
root/cat/asd932_.png

```

kmnist_dataset	<i>Kuzushiji-MNIST</i>
----------------	------------------------

Description

Prepares the **Kuzushiji-MNIST** dataset and optionally downloads it.

Usage

```

kmnist_dataset(
    root,
    train = TRUE,
    transform = NULL,
    target_transform = NULL,
    download = FALSE
)

```

Arguments

root	(string): Root directory of dataset where KMNIIST/processed/training.pt and KMNIIST/processed/test.pt exist.
train	(bool, optional): If TRUE, creates dataset from training.pt, otherwise from test.pt.
transform	(callable, optional): A function/transform that takes in an PIL image and returns a transformed version. E.g, transforms.RandomCrop.
target_transform	(callable, optional): A function/transform that takes in the target and transforms it.
download	(bool, optional): If true, downloads the dataset from the internet and puts it in root directory. If dataset is already downloaded, it is not downloaded again.

magick_loader	<i>Load an Image using ImageMagick</i>
---------------	--

Description

Load an image located at path using the {magick} package.

Usage

```
magick_loader(path)
```


Arguments

path path to the image to load from.

mnist_dataset *MNIST dataset*

Description

Prepares the MNIST dataset and optionally downloads it.

Usage

```
mnist_dataset(
    root,
    train = TRUE,
    transform = NULL,
    target_transform = NULL,
    download = FALSE
)
```

Arguments

root (string): Root directory of dataset where MNIST/processed/training.pt and MNIST/processed/test.pt exist.

train (bool, optional): If True, creates dataset from training.pt, otherwise from test.pt.

transform (callable, optional): A function/transform that takes in an PIL image and returns a transformed version. E.g, transforms.RandomCrop.

target_transform (callable, optional): A function/transform that takes in the target and transforms it.

download (bool, optional): If true, downloads the dataset from the internet and puts it in root directory. If dataset is already downloaded, it is not downloaded again.

model_alexnet *AlexNet Model Architecture*

Description

AlexNet model architecture from the [One weird trick...](#) paper.

Usage

```
model_alexnet(pretrained = FALSE, progress = TRUE, ...)
```

Arguments

pretrained	(bool): If TRUE, returns a model pre-trained on ImageNet.
progress	(bool): If TRUE, displays a progress bar of the download to stderr.
...	other parameters passed to the model initializer. currently only num_classes is used.

See Also

Other models: [model_mobilenet_v2\(\)](#), [model_resnet](#)

model_inception_v3 *Inception v3 model*

Description

Architecture from [Rethinking the Inception Architecture for Computer Vision](#) The required minimum input size of the model is 75x75.

Usage

```
model_inception_v3(pretrained = FALSE, progress = TRUE, ...)
```

Arguments

pretrained	(bool): If True, returns a model pre-trained on ImageNet
progress	(bool): If True, displays a progress bar of the download to stderr
...	Used to pass keyword arguments to the Inception module: <ul style="list-style-type: none"> • aux_logits (bool): If True, add an auxiliary branch that can improve training. Default: <i>True</i> • transform_input (bool): If True, preprocesses the input according to the method with which it was trained on ImageNet. Default: <i>False</i>

Note

Important: In contrast to the other models the inception_v3 expects tensors with a size of N x 3 x 299 x 299, so ensure your images are sized accordingly.

model_mobilenet_v2	<i>Constructs a MobileNetV2 architecture from https://arxiv.org/abs/1801.04381 MobileNetV2: Inverted Residuals and Linear Bottlenecks.</i>
--------------------	---

Description

Constructs a MobileNetV2 architecture from [MobileNetV2: Inverted Residuals and Linear Bottlenecks](#).

Usage

```
model_mobilenet_v2(pretrained = FALSE, progress = TRUE, ...)
```

Arguments

pretrained (bool): If TRUE, returns a model pre-trained on ImageNet.
 progress (bool): If TRUE, displays a progress bar of the download to stderr.
 ... Other parameters passed to the model implementation.

See Also

Other models: [model_alexnet\(\)](#), [model_resnet](#)

model_resnet	<i>ResNet implementation</i>
--------------	------------------------------

Description

ResNet models implementation from [Deep Residual Learning for Image Recognition](#) and later related papers (see Functions)

Usage

```
model_resnet18(pretrained = FALSE, progress = TRUE, ...)
model_resnet34(pretrained = FALSE, progress = TRUE, ...)
model_resnet50(pretrained = FALSE, progress = TRUE, ...)
model_resnet101(pretrained = FALSE, progress = TRUE, ...)
model_resnet152(pretrained = FALSE, progress = TRUE, ...)
model_resnext50_32x4d(pretrained = FALSE, progress = TRUE, ...)
```

```
model_resnext101_32x8d(pretrained = FALSE, progress = TRUE, ...)
```

```
model_wide_resnet50_2(pretrained = FALSE, progress = TRUE, ...)
```

```
model_wide_resnet101_2(pretrained = FALSE, progress = TRUE, ...)
```

Arguments

pretrained (bool): If TRUE, returns a model pre-trained on ImageNet.
 progress (bool): If TRUE, displays a progress bar of the download to stderr.
 ... Other parameters passed to the resnet model.

Functions

- `model_resnet18()`: ResNet 18-layer model
- `model_resnet34()`: ResNet 34-layer model
- `model_resnet50()`: ResNet 50-layer model
- `model_resnet101()`: ResNet 101-layer model
- `model_resnet152()`: ResNet 152-layer model
- `model_resnext50_32x4d()`: ResNeXt-50 32x4d model from "[Aggregated Residual Transformation for Deep Neural Networks](#)" with 32 groups having each a width of 4.
- `model_resnext101_32x8d()`: ResNeXt-101 32x8d model from "[Aggregated Residual Transformation for Deep Neural Networks](#)" with 32 groups having each a width of 8.
- `model_wide_resnet50_2()`: Wide ResNet-50-2 model from "[Wide Residual Networks](#)" with width per group of 128.
- `model_wide_resnet101_2()`: Wide ResNet-101-2 model from "[Wide Residual Networks](#)" with width per group of 128.

See Also

Other models: [model_alexnet\(\)](#), [model_mobilenet_v2\(\)](#)

model_vgg

VGG implementation

Description

VGG models implementations based on [Very Deep Convolutional Networks For Large-Scale Image Recognition](#)

Usage

```

model_vgg11(pretrained = FALSE, progress = TRUE, ...)
model_vgg11_bn(pretrained = FALSE, progress = TRUE, ...)
model_vgg13(pretrained = FALSE, progress = TRUE, ...)
model_vgg13_bn(pretrained = FALSE, progress = TRUE, ...)
model_vgg16(pretrained = FALSE, progress = TRUE, ...)
model_vgg16_bn(pretrained = FALSE, progress = TRUE, ...)
model_vgg19(pretrained = FALSE, progress = TRUE, ...)
model_vgg19_bn(pretrained = FALSE, progress = TRUE, ...)

```

Arguments

```

pretrained      (bool): If TRUE, returns a model pre-trained on ImageNet
progress        (bool): If TRUE, displays a progress bar of the download to stderr
...            other parameters passed to the VGG model implementation.

```

Functions

- `model_vgg11()`: VGG 11-layer model (configuration "A")
- `model_vgg11_bn()`: VGG 11-layer model (configuration "A") with batch normalization
- `model_vgg13()`: VGG 13-layer model (configuration "B")
- `model_vgg13_bn()`: VGG 13-layer model (configuration "B") with batch normalization
- `model_vgg16()`: VGG 13-layer model (configuration "D")
- `model_vgg16_bn()`: VGG 13-layer model (configuration "D") with batch normalization
- `model_vgg19()`: VGG 19-layer model (configuration "E")
- `model_vgg19_bn()`: VGG 19-layer model (configuration "E") with batch normalization

tensor_image_browse *Display image tensor*

Description

Display image tensor into browser

Usage

```
tensor_image_browse(image, browser = getOption("browser"))
```

Arguments

image	torch_tensor() of shape (1, W, H) for grayscale image or (3, W, H) for color image, of type torch_uint8() to display
browser	argument passed to browseURL

tensor_image_display *Display image tensor*

Description

Display image tensor onto the X11 device

Usage

```
tensor_image_display(image, animate = TRUE)
```

Arguments

image	torch_tensor() of shape (1, W, H) for grayscale image or (3, W, H) for color image, of type torch_uint8() to display
animate	support animations in the X11 display

tiny_imagenet_dataset *Tiny ImageNet dataset*

Description

Prepares the Tiny ImageNet dataset and optionally downloads it.

Usage

```
tiny_imagenet_dataset(root, split = "train", download = FALSE, ...)
```

Arguments

root	directory path to download the dataset.
split	dataset split, train, validation or test.
download	whether to download or not the dataset.
...	other arguments passed to image_folder_dataset() .

transform_adjust_brightness
Adjust the brightness of an image

Description

Adjust the brightness of an image

Usage

```
transform_adjust_brightness(img, brightness_factor)
```

Arguments

`img` A magick-image, array or torch_tensor.
`brightness_factor` (float): How much to adjust the brightness. Can be any non negative number. 0 gives a black image, 1 gives the original image while 2 increases the brightness by a factor of 2.

See Also

Other transforms: [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_adjust_saturation\(\)](#), [transform_affine\(\)](#), [transform_center_crop\(\)](#), [transform_color_jitter\(\)](#), [transform_convert_image_dtype\(\)](#), [transform_crop\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_hflip\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_affine\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_horizontal_flip\(\)](#), [transform_random_order\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

transform_adjust_contrast
Adjust the contrast of an image

Description

Adjust the contrast of an image

Usage

```
transform_adjust_contrast(img, contrast_factor)
```

Arguments

`img` A magick-image, array or torch_tensor.
`contrast_factor` (float): How much to adjust the contrast. Can be any non negative number. 0 gives a solid gray image, 1 gives the original image while 2 increases the contrast by a factor of 2.

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

transform_adjust_gamma

Adjust the gamma of an RGB image

Description

Also known as Power Law Transform. Intensities in RGB mode are adjusted based on the following equation:

$$I_{\text{out}} = 255 \times \text{gain} \times \left(\frac{I_{\text{in}}}{255} \right)^\gamma$$

Usage

`transform_adjust_gamma(img, gamma, gain = 1)`

Arguments

`img` A magick-image, array or torch_tensor.
`gamma` (float): Non negative real number, same as γ in the equation. gamma larger than 1 make the shadows darker, while gamma smaller than 1 make dark regions lighter.
`gain` (float): The constant multiplier.

Details

See [Gamma Correction](#) for more details.

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

`transform_adjust_hue` *Adjust the hue of an image*

Description

The image hue is adjusted by converting the image to HSV and cyclically shifting the intensities in the hue channel (H). The image is then converted back to original image mode.

Usage

```
transform_adjust_hue(img, hue_factor)
```

Arguments

<code>img</code>	A magick-image, array or torch_tensor.
<code>hue_factor</code>	(float): How much to shift the hue channel. Should be in $[-0.5, 0.5]$. 0.5 and -0.5 give complete reversal of hue channel in HSV space in positive and negative direction respectively. 0 means no shift. Therefore, both -0.5 and 0.5 will give an image with complementary colors while 0 gives the original image.

Details

`hue_factor` is the amount of shift in H channel and must be in the interval $[-0.5, 0.5]$.

See [Hue](#) for more details.

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`,

[transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

transform_adjust_saturation

Adjust the color saturation of an image

Description

Adjust the color saturation of an image

Usage

```
transform_adjust_saturation(img, saturation_factor)
```

Arguments

`img` A magick-image, array or torch_tensor.

`saturation_factor`

(float): How much to adjust the saturation. 0 will give a black and white image, 1 will give the original image while 2 will enhance the saturation by a factor of 2.

See Also

Other transforms: [transform_adjust_brightness\(\)](#), [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_affine\(\)](#), [transform_center_crop\(\)](#), [transform_color_jitter\(\)](#), [transform_convert_image_dtype\(\)](#), [transform_crop\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_hflip\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_affine\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_horizontal_flip\(\)](#), [transform_random_order\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

transform_affine	<i>Apply affine transformation on an image keeping image center invariant</i>
------------------	---

Description

Apply affine transformation on an image keeping image center invariant

Usage

```
transform_affine(
    img,
    angle,
    translate,
    scale,
    shear,
    resample = 0,
    fillcolor = NULL
)
```

Arguments

img	A magick-image, array or torch_tensor.
angle	(float or int): rotation angle value in degrees, counter-clockwise.
translate	(tuple, optional): tuple of maximum absolute fraction for horizontal and vertical translations. For example translate=(a, b), then horizontal shift is randomly sampled in the range $-img_width * a < dx < img_width * a$ and vertical shift is randomly sampled in the range $-img_height * b < dy < img_height * b$. Will not translate by default.
scale	(tuple, optional): scaling factor interval, e.g (a, b), then scale is randomly sampled from the range $a \leq scale \leq b$. Will keep original scale by default.
shear	(sequence or float or int, optional): Range of degrees to select from. If shear is a number, a shear parallel to the x axis in the range (-shear, +shear) will be applied. Else if shear is a tuple or list of 2 values a shear parallel to the x axis in the range (shear[1], shear[2]) will be applied. Else if shear is a tuple or list of 4 values, a x-axis shear in (shear[1], shear[2]) and y-axis shear in (shear[3], shear[4]) will be applied. Will not apply shear by default.
resample	(int, optional): An optional resampling filter.
fillcolor	(tuple or int): Optional fill color (Tuple for RGB Image and int for grayscale) for the area outside the transform in the output image (Pillow>=5.0.0). This option is not supported for Tensor input. Fill value for the area outside the transform in the output image is always 0.

See Also

Other transforms: [transform_adjust_brightness\(\)](#), [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_adjust_saturation\(\)](#), [transform_center_crop\(\)](#), [transform_color_jitter\(\)](#), [transform_convert_image_dtype\(\)](#), [transform_crop\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_hflip\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_affine\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_horizontal_flip\(\)](#), [transform_random_order\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

`transform_center_crop` *Crops the given image at the center*

Description

The image can be a Magick Image or a torch Tensor, in which case it is expected to have `[... , H, W]` shape, where ... means an arbitrary number of leading dimensions.

Usage

```
transform_center_crop(img, size)
```

Arguments

<code>img</code>	A magick-image, array or torch_tensor.
<code>size</code>	(sequence or int): Desired output size of the crop. If size is an int instead of sequence like (h, w), a square crop (size, size) is made. If provided a tuple or list of length 1, it will be interpreted as (size, size).

See Also

Other transforms: [transform_adjust_brightness\(\)](#), [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_adjust_saturation\(\)](#), [transform_affine\(\)](#), [transform_color_jitter\(\)](#), [transform_convert_image_dtype\(\)](#), [transform_crop\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_hflip\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_affine\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_horizontal_flip\(\)](#), [transform_random_order\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

transform_color_jitter

Randomly change the brightness, contrast and saturation of an image

Description

Randomly change the brightness, contrast and saturation of an image

Usage

```
transform_color_jitter(
    img,
    brightness = 0,
    contrast = 0,
    saturation = 0,
    hue = 0
)
```

Arguments

img	A magick-image, array or torch_tensor.
brightness	(float or tuple of float (min, max)): How much to jitter brightness. brightness_factor is chosen uniformly from [max(0, 1 - brightness), 1 + brightness] or the given [min, max]. Should be non negative numbers.
contrast	(float or tuple of float (min, max)): How much to jitter contrast. contrast_factor is chosen uniformly from [max(0, 1 - contrast), 1 + contrast] or the given [min, max]. Should be non negative numbers.
saturation	(float or tuple of float (min, max)): How much to jitter saturation. saturation_factor is chosen uniformly from [max(0, 1 - saturation), 1 + saturation] or the given [min, max]. Should be non negative numbers.
hue	(float or tuple of float (min, max)): How much to jitter hue. hue_factor is chosen uniformly from [-hue, hue] or the given [min, max]. Should have 0 <= hue <= 0.5 or -0.5 <= min <= max <= 0.5.

See Also

Other transforms: [transform_adjust_brightness\(\)](#), [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_adjust_saturation\(\)](#), [transform_affine\(\)](#), [transform_center_crop\(\)](#), [transform_convert_image_dtype\(\)](#), [transform_crop\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_hflip\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_affine\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_horizontal_flip\(\)](#), [transform_random_order\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

transform_convert_image_dtype

Convert a tensor image to the given dtype and scale the values accordingly

Description

Convert a tensor image to the given dtype and scale the values accordingly

Usage

```
transform_convert_image_dtype(img, dtype = torch::torch_float())
```

Arguments

`img` A magick-image, array or torch_tensor.
`dtype` (torch.dtype): Desired data type of the output.

Note

When converting from a smaller to a larger integer dtype the maximum values are **not** mapped exactly. If converted back and forth, this mismatch has no effect.

See Also

Other transforms: [transform_adjust_brightness\(\)](#), [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_adjust_saturation\(\)](#), [transform_affine\(\)](#), [transform_center_crop\(\)](#), [transform_color_jitter\(\)](#), [transform_crop\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_hflip\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_affine\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_horizontal_flip\(\)](#), [transform_random_order\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

transform_crop

Crop the given image at specified location and output size

Description

Crop the given image at specified location and output size

Usage

```
transform_crop(img, top, left, height, width)
```

Arguments

img	A magick-image, array or torch_tensor.
top	(int): Vertical component of the top left corner of the crop box.
left	(int): Horizontal component of the top left corner of the crop box.
height	(int): Height of the crop box.
width	(int): Width of the crop box.

See Also

Other transforms: [transform_adjust_brightness\(\)](#), [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_adjust_saturation\(\)](#), [transform_affine\(\)](#), [transform_center_crop\(\)](#), [transform_color_jitter\(\)](#), [transform_convert_image_dtype\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_hflip\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_affine\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_horizontal_flip\(\)](#), [transform_random_order\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

transform_five_crop *Crop image into four corners and a central crop*

Description

Crop the given image into four corners and the central crop. This transform returns a tuple of images and there may be a mismatch in the number of inputs and targets your Dataset returns.

Usage

```
transform_five_crop(img, size)
```

Arguments

img	A magick-image, array or torch_tensor.
size	(sequence or int): Desired output size. If size is a sequence like (h, w), output size will be matched to this. If size is an int, smaller edge of the image will be matched to this number. i.e, if height > width, then image will be rescaled to (size * height / width, size).

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

`transform_grayscale` *Convert image to grayscale*

Description

Convert image to grayscale

Usage

```
transform_grayscale(img, num_output_channels)
```

Arguments

`img` A magick-image, array or torch_tensor.
`num_output_channels`
 (int): (1 or 3) number of channels desired for output image

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

transform_hflip	<i>Horizontally flip a PIL Image or Tensor</i>
-----------------	--

Description

Horizontally flip a PIL Image or Tensor

Usage

```
transform_hflip(img)
```

Arguments

img A magick-image, array or torch_tensor.

See Also

Other transforms: [transform_adjust_brightness\(\)](#), [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_adjust_saturation\(\)](#), [transform_affine\(\)](#), [transform_center_crop\(\)](#), [transform_color_jitter\(\)](#), [transform_convert_image_dtype\(\)](#), [transform_crop\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_affine\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_horizontal_flip\(\)](#), [transform_random_order\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

transform_linear_transformation

Transform a tensor image with a square transformation matrix and a mean_vector computed offline

Description

Given transformation_matrix and mean_vector, will flatten the torch_tensor and subtract mean_vector from it which is then followed by computing the dot product with the transformation matrix and then reshaping the tensor to its original shape.

Usage

```
transform_linear_transformation(img, transformation_matrix, mean_vector)
```

Arguments

`img` A magick-image, array or torch_tensor.
`transformation_matrix` (Tensor): tensor [D x D], D = C x H x W.
`mean_vector` (Tensor): tensor D, D = C x H x W.

Applications

whitening transformation: Suppose X is a column vector zero-centered data. Then compute the data covariance matrix [D x D] with `torch.mm(X.t(), X)`, perform SVD on this matrix and pass it as `transformation_matrix`.

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

`transform_normalize` *Normalize a tensor image with mean and standard deviation*

Description

Given mean: (mean[1], ..., mean[n]) and std: (std[1], ..., std[n]) for n channels, this transform will normalize each channel of the input torch_tensor i.e., `output[channel] = (input[channel] - mean[channel]) / std[channel]`

Usage

```
transform_normalize(img, mean, std, inplace = FALSE)
```

Arguments

`img` A magick-image, array or torch_tensor.
`mean` (sequence): Sequence of means for each channel.
`std` (sequence): Sequence of standard deviations for each channel.
`inplace` (bool, optional): Bool to make this operation in-place.

Note

This transform acts out of place, i.e., it does not mutate the input tensor.

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

transform_pad

Pad the given image on all sides with the given "pad" value

Description

The image can be a Magick Image or a torch Tensor, in which case it is expected to have [..., H, W] shape, where ... means an arbitrary number of leading dimensions.

Usage

```
transform_pad(img, padding, fill = 0, padding_mode = "constant")
```

Arguments

<code>img</code>	A magick-image, array or torch_tensor.
<code>padding</code>	(int or tuple or list): Padding on each border. If a single int is provided this is used to pad all borders. If tuple of length 2 is provided this is the padding on left/right and top/bottom respectively. If a tuple of length 4 is provided this is the padding for the left, right, top and bottom borders respectively.
<code>fill</code>	(int or str or tuple): Pixel fill value for constant fill. Default is 0. If a tuple of length 3, it is used to fill R, G, B channels respectively. This value is only used when the padding_mode is constant. Only int value is supported for Tensors.
<code>padding_mode</code>	Type of padding. Should be: constant, edge, reflect or symmetric. Default is constant. Mode symmetric is not yet supported for Tensor inputs. <ul style="list-style-type: none"> constant: pads with a constant value, this value is specified with fill edge: pads with the last value on the edge of the image reflect: pads with reflection of image (without repeating the last value on the edge) padding [1, 2, 3, 4] with 2 elements on both sides in reflect mode will result in [3, 2, 1, 2, 3, 4, 3, 2]

- symmetric: pads with reflection of image (repeating the last value on the edge) padding [1, 2, 3, 4] with 2 elements on both sides in symmetric mode will result in [2, 1, 1, 2, 3, 4, 4, 3]

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

transform_perspective *Perspective transformation of an image*

Description

Perspective transformation of an image

Usage

```
transform_perspective(
    img,
    startpoints,
    endpoints,
    interpolation = 2,
    fill = NULL
)
```

Arguments

<code>img</code>	A magick-image, array or torch_tensor.
<code>startpoints</code>	(list of list of ints): List containing four lists of two integers corresponding to four corners [top-left, top-right, bottom-right, bottom-left] of the original image.
<code>endpoints</code>	(list of list of ints): List containing four lists of two integers corresponding to four corners [top-left, top-right, bottom-right, bottom-left] of the transformed image.
<code>interpolation</code>	(int, optional) Desired interpolation. An integer 0 = nearest, 2 = bilinear, and 3 = bicubic or a name from <code>magick::filter_types()</code> .
<code>fill</code>	(int or str or tuple): Pixel fill value for constant fill. Default is 0. If a tuple of length 3, it is used to fill R, G, B channels respectively. This value is only used when the <code>padding_mode</code> is constant. Only int value is supported for Tensors.

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

transform_random_affine

Random affine transformation of the image keeping center invariant

Description

Random affine transformation of the image keeping center invariant

Usage

```
transform_random_affine(
    img,
    degrees,
    translate = NULL,
    scale = NULL,
    shear = NULL,
    resample = 0,
    fillcolor = 0
)
```

Arguments

<code>img</code>	A magick-image, array or torch_tensor.
<code>degrees</code>	(sequence or float or int): Range of degrees to select from. If degrees is a number instead of sequence like (min, max), the range of degrees will be (-degrees, +degrees).
<code>translate</code>	(tuple, optional): tuple of maximum absolute fraction for horizontal and vertical translations. For example translate=(a, b), then horizontal shift is randomly sampled in the range $-img_width * a < dx < img_width * a$ and vertical shift is randomly sampled in the range $-img_height * b < dy < img_height * b$. Will not translate by default.
<code>scale</code>	(tuple, optional): scaling factor interval, e.g (a, b), then scale is randomly sampled from the range $a \leq scale \leq b$. Will keep original scale by default.

shear	(sequence or float or int, optional): Range of degrees to select from. If shear is a number, a shear parallel to the x axis in the range (-shear, +shear) will be applied. Else if shear is a tuple or list of 2 values a shear parallel to the x axis in the range (shear[1], shear[2]) will be applied. Else if shear is a tuple or list of 4 values, a x-axis shear in (shear[1], shear[2]) and y-axis shear in (shear[3], shear[4]) will be applied. Will not apply shear by default.
resample	(int, optional): An optional resampling filter.
fillcolor	(tuple or int): Optional fill color (Tuple for RGB Image and int for grayscale) for the area outside the transform in the output image (Pillow>=5.0.0). This option is not supported for Tensor input. Fill value for the area outside the transform in the output image is always 0.

See Also

Other transforms: [transform_adjust_brightness\(\)](#), [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_adjust_saturation\(\)](#), [transform_affine\(\)](#), [transform_center_crop\(\)](#), [transform_color_jitter\(\)](#), [transform_convert_image_dtype\(\)](#), [transform_crop\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_hflip\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_horizontal_flip\(\)](#), [transform_random_order\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

transform_random_apply

Apply a list of transformations randomly with a given probability

Description

Apply a list of transformations randomly with a given probability

Usage

```
transform_random_apply(img, transforms, p = 0.5)
```

Arguments

img	A magick-image, array or torch_tensor.
transforms	(list or tuple): list of transformations.
p	(float): probability.

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

`transform_random_choice`

Apply single transformation randomly picked from a list

Description

Apply single transformation randomly picked from a list

Usage

```
transform_random_choice(img, transforms)
```

Arguments

`img` A magick-image, array or torch_tensor.
`transforms` (list or tuple): list of transformations.

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

transform_random_crop *Crop the given image at a random location*

Description

The image can be a Magick Image or a Tensor, in which case it is expected to have [..., H, W] shape, where ... means an arbitrary number of leading dimensions.

Usage

```
transform_random_crop(
    img,
    size,
    padding = NULL,
    pad_if_needed = FALSE,
    fill = 0,
    padding_mode = "constant"
)
```

Arguments

img	A magick-image, array or torch_tensor.
size	(sequence or int): Desired output size. If size is a sequence like (h, w), output size will be matched to this. If size is an int, smaller edge of the image will be matched to this number. i.e, if height > width, then image will be rescaled to (size * height / width, size).
padding	(int or tuple or list): Padding on each border. If a single int is provided this is used to pad all borders. If tuple of length 2 is provided this is the padding on left/right and top/bottom respectively. If a tuple of length 4 is provided this is the padding for the left, right, top and bottom borders respectively.
pad_if_needed	(boolean): It will pad the image if smaller than the desired size to avoid raising an exception. Since cropping is done after padding, the padding seems to be done at a random offset.
fill	(int or str or tuple): Pixel fill value for constant fill. Default is 0. If a tuple of length 3, it is used to fill R, G, B channels respectively. This value is only used when the padding_mode is constant. Only int value is supported for Tensors.
padding_mode	Type of padding. Should be: constant, edge, reflect or symmetric. Default is constant. Mode symmetric is not yet supported for Tensor inputs. <ul style="list-style-type: none"> constant: pads with a constant value, this value is specified with fill edge: pads with the last value on the edge of the image reflect: pads with reflection of image (without repeating the last value on the edge) padding [1, 2, 3, 4] with 2 elements on both sides in reflect mode will result in [3, 2, 1, 2, 3, 4, 3, 2] symmetric: pads with reflection of image (repeating the last value on the edge) padding [1, 2, 3, 4] with 2 elements on both sides in symmetric mode will result in [2, 1, 1, 2, 3, 4, 4, 3]

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

transform_random_erasing

Randomly selects a rectangular region in an image and erases its pixel values

Description

'Random Erasing Data Augmentation' by Zhong *et al.* See <https://arxiv.org/pdf/1708.04896.pdf>

Usage

```
transform_random_erasing(
    img,
    p = 0.5,
    scale = c(0.02, 0.33),
    ratio = c(0.3, 3.3),
    value = 0,
    inplace = FALSE
)
```

Arguments

<code>img</code>	A magick-image, array or torch_tensor.
<code>p</code>	probability that the random erasing operation will be performed.
<code>scale</code>	range of proportion of erased area against input image.
<code>ratio</code>	range of aspect ratio of erased area.
<code>value</code>	erasing value. Default is 0. If a single int, it is used to erase all pixels. If a tuple of length 3, it is used to erase R, G, B channels respectively. If a str of 'random', erasing each pixel with random values.
<code>inplace</code>	boolean to make this transform inplace. Default set to FALSE.

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

`transform_random_grayscale`

Randomly convert image to grayscale with a given probability

Description

Convert image to grayscale with a probability of `p`.

Usage

```
transform_random_grayscale(img, p = 0.1)
```

Arguments

<code>img</code>	A magick-image, array or torch_tensor.
<code>p</code>	(float): probability that image should be converted to grayscale (default 0.1).

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

`transform_random_horizontal_flip`*Horizontally flip an image randomly with a given probability*

Description

Horizontally flip an image randomly with a given probability. The image can be a Magick Image or a torch Tensor, in which case it is expected to have [..., H, W] shape, where ... means an arbitrary number of leading dimensions

Usage

```
transform_random_horizontal_flip(img, p = 0.5)
```

Arguments

`img` A magick-image, array or torch_tensor.
`p` (float): probability of the image being flipped. Default value is 0.5

See Also

Other transforms: [transform_adjust_brightness\(\)](#), [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_adjust_saturation\(\)](#), [transform_affine\(\)](#), [transform_center_crop\(\)](#), [transform_color_jitter\(\)](#), [transform_convert_image_dtype\(\)](#), [transform_crop\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_hflip\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_affine\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_order\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

`transform_random_order`*Apply a list of transformations in a random order*

Description

Apply a list of transformations in a random order

Usage

```
transform_random_order(img, transforms)
```

Arguments

`img` A magick-image, array or torch_tensor.
`transforms` (list or tuple): list of transformations.

See Also

Other transforms: [transform_adjust_brightness\(\)](#), [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_adjust_saturation\(\)](#), [transform_affine\(\)](#), [transform_center_crop\(\)](#), [transform_color_jitter\(\)](#), [transform_convert_image_dtype\(\)](#), [transform_crop\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_hflip\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_affine\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_horizontal_flip\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

transform_random_perspective

Random perspective transformation of an image with a given probability

Description

Performs a random perspective transformation of the given image with a given probability

Usage

```
transform_random_perspective(  
    img,  
    distortion_scale = 0.5,  
    p = 0.5,  
    interpolation = 2,  
    fill = 0  
)
```

Arguments

`img` A magick-image, array or torch_tensor.
`distortion_scale` (float): argument to control the degree of distortion and ranges from 0 to 1. Default is 0.5.
`p` (float): probability of the image being transformed. Default is 0.5.
`interpolation` (int, optional) Desired interpolation. An integer 0 = nearest, 2 = bilinear, and 3 = bicubic or a name from [magick::filter_types\(\)](#).

`fill` (int or str or tuple): Pixel fill value for constant fill. Default is 0. If a tuple of length 3, it is used to fill R, G, B channels respectively. This value is only used when the `padding_mode` is constant. Only int value is supported for Tensors.

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

`transform_random_resized_crop`

Crop image to random size and aspect ratio

Description

Crop the given image to a random size and aspect ratio. The image can be a Magick Image or a Tensor, in which case it is expected to have [..., H, W] shape, where ... means an arbitrary number of leading dimensions

Usage

```
transform_random_resized_crop(
    img,
    size,
    scale = c(0.08, 1),
    ratio = c(3/4, 4/3),
    interpolation = 2
)
```

Arguments

`img` A magick-image, array or `torch_tensor`.

`size` (sequence or int): Desired output size. If size is a sequence like (h, w), output size will be matched to this. If size is an int, smaller edge of the image will be matched to this number. i.e, if height > width, then image will be rescaled to (size * height / width, size).

`scale` (tuple of float): range of size of the origin size cropped

`ratio` (tuple of float): range of aspect ratio of the origin aspect ratio cropped.

`interpolation` (int, optional) Desired interpolation. An integer 0 = nearest, 2 = bilinear, and 3 = bicubic or a name from `magick::filter_types()`.

Details

A crop of random size (default: of 0.08 to 1.0) of the original size and a random aspect ratio (default: of 3/4 to 4/3) of the original aspect ratio is made. This crop is finally resized to given size. This is popularly used to train the Inception networks.

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

transform_random_rotation

Rotate the image by angle

Description

Rotate the image by angle

Usage

```
transform_random_rotation(
    img,
    degrees,
    resample = FALSE,
    expand = FALSE,
    center = NULL,
    fill = NULL
)
```

Arguments

<code>img</code>	A magick-image, array or torch_tensor.
<code>degrees</code>	(sequence or float or int): Range of degrees to select from. If degrees is a number instead of sequence like (min, max), the range of degrees will be (-degrees, +degrees).
<code>resample</code>	(int, optional): An optional resampling filter.

expand	(bool, optional): Optional expansion flag. If true, expands the output to make it large enough to hold the entire rotated image. If false or omitted, make the output image the same size as the input image. Note that the expand flag assumes rotation around the center and no translation.
center	(list or tuple, optional): Optional center of rotation, (x, y). Origin is the upper left corner. Default is the center of the image.
fill	(n-tuple or int or float): Pixel fill value for area outside the rotated image. If int or float, the value is used for all bands respectively. Defaults to 0 for all bands. This option is only available for Pillow>=5.2.0. This option is not supported for Tensor input. Fill value for the area outside the transform in the output image is always 0.

See Also

Other transforms: [transform_adjust_brightness\(\)](#), [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_adjust_saturation\(\)](#), [transform_affine\(\)](#), [transform_center_crop\(\)](#), [transform_color_jitter\(\)](#), [transform_convert_image_dtype\(\)](#), [transform_crop\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_hflip\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_affine\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_horizontal_flip\(\)](#), [transform_random_order\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

transform_random_vertical_flip

Vertically flip an image randomly with a given probability

Description

The image can be a PIL Image or a torch Tensor, in which case it is expected to have $[\dots, H, W]$ shape, where \dots means an arbitrary number of leading dimensions

Usage

```
transform_random_vertical_flip(img, p = 0.5)
```

Arguments

img	A magick-image, array or torch_tensor.
p	(float): probability of the image being flipped. Default value is 0.5

See Also

Other transforms: [transform_adjust_brightness\(\)](#), [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_adjust_saturation\(\)](#), [transform_affine\(\)](#), [transform_center_crop\(\)](#), [transform_color_jitter\(\)](#), [transform_convert_image_dtype\(\)](#), [transform_crop\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_hflip\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_affine\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_horizontal_flip\(\)](#), [transform_random_order\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

transform_resize	<i>Resize the input image to the given size</i>
------------------	---

Description

The image can be a Magic Image or a torch Tensor, in which case it is expected to have [... , H, W] shape, where ... means an arbitrary number of leading dimensions

Usage

```
transform_resize(img, size, interpolation = 2)
```

Arguments

img	A magick-image, array or torch_tensor.
size	(sequence or int): Desired output size. If size is a sequence like (h, w), output size will be matched to this. If size is an int, smaller edge of the image will be matched to this number. i.e, if height > width, then image will be rescaled to (size * height / width, size).
interpolation	(int, optional) Desired interpolation. An integer 0 = nearest, 2 = bilinear, and 3 = bicubic or a name from <code>magick::filter_types()</code> .

See Also

Other transforms: [transform_adjust_brightness\(\)](#), [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_adjust_saturation\(\)](#), [transform_affine\(\)](#), [transform_center_crop\(\)](#), [transform_color_jitter\(\)](#), [transform_convert_image_dtype\(\)](#), [transform_crop\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_hflip\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_affine\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_horizontal_flip\(\)](#), [transform_random_order\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

`transform_resized_crop`*Crop an image and resize it to a desired size*

Description

Crop an image and resize it to a desired size

Usage

```
transform_resized_crop(img, top, left, height, width, size, interpolation = 2)
```

Arguments

<code>img</code>	A magick-image, array or torch_tensor.
<code>top</code>	(int): Vertical component of the top left corner of the crop box.
<code>left</code>	(int): Horizontal component of the top left corner of the crop box.
<code>height</code>	(int): Height of the crop box.
<code>width</code>	(int): Width of the crop box.
<code>size</code>	(sequence or int): Desired output size. If size is a sequence like (h, w), output size will be matched to this. If size is an int, smaller edge of the image will be matched to this number. i.e, if height > width, then image will be rescaled to (size * height / width, size).
<code>interpolation</code>	(int, optional) Desired interpolation. An integer 0 = nearest, 2 = bilinear, and 3 = bicubic or a name from <code>magick::filter_types()</code> .

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

transform_rgb_to_grayscale

Convert RGB Image Tensor to Grayscale

Description

For RGB to Grayscale conversion, ITU-R 601-2 luma transform is performed which is $L = R * 0.2989 + G * 0.5870 + B * 0.1140$

Usage

```
transform_rgb_to_grayscale(img)
```

Arguments

img A magick-image, array or torch_tensor.

See Also

Other transforms: [transform_adjust_brightness\(\)](#), [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_adjust_saturation\(\)](#), [transform_affine\(\)](#), [transform_center_crop\(\)](#), [transform_color_jitter\(\)](#), [transform_convert_image_dtype\(\)](#), [transform_crop\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_hflip\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_affine\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_horizontal_flip\(\)](#), [transform_random_order\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rotate\(\)](#), [transform_ten_crop\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

transform_rotate

Angular rotation of an image

Description

Angular rotation of an image

Usage

```
transform_rotate(
    img,
    angle,
    resample = 0,
    expand = FALSE,
    center = NULL,
    fill = NULL
)
```

Arguments

<code>img</code>	A magick-image, array or torch_tensor.
<code>angle</code>	(float or int): rotation angle value in degrees, counter-clockwise.
<code>resample</code>	(int, optional): An optional resampling filter.
<code>expand</code>	(bool, optional): Optional expansion flag. If true, expands the output to make it large enough to hold the entire rotated image. If false or omitted, make the output image the same size as the input image. Note that the expand flag assumes rotation around the center and no translation.
<code>center</code>	(list or tuple, optional): Optional center of rotation, (x, y). Origin is the upper left corner. Default is the center of the image.
<code>fill</code>	(n-tuple or int or float): Pixel fill value for area outside the rotated image. If int or float, the value is used for all bands respectively. Defaults to 0 for all bands. This option is only available for Pillow>=5.2.0. This option is not supported for Tensor input. Fill value for the area outside the transform in the output image is always 0.

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_ten_crop()`, `transform_to_tensor()`, `transform_vflip()`

<code>transform_ten_crop</code>	<i>Crop an image and the flipped image each into four corners and a central crop</i>
---------------------------------	--

Description

Crop the given image into four corners and the central crop, plus the flipped version of these (horizontal flipping is used by default). This transform returns a tuple of images and there may be a mismatch in the number of inputs and targets your Dataset returns.

Usage

```
transform_ten_crop(img, size, vertical_flip = FALSE)
```

Arguments

<code>img</code>	A magick-image, array or torch_tensor.
<code>size</code>	(sequence or int): Desired output size. If size is a sequence like (h, w), output size will be matched to this. If size is an int, smaller edge of the image will be matched to this number. i.e, if height > width, then image will be rescaled to (size * height / width, size).
<code>vertical_flip</code>	(bool): Use vertical flipping instead of horizontal

See Also

Other transforms: [transform_adjust_brightness\(\)](#), [transform_adjust_contrast\(\)](#), [transform_adjust_gamma\(\)](#), [transform_adjust_hue\(\)](#), [transform_adjust_saturation\(\)](#), [transform_affine\(\)](#), [transform_center_crop\(\)](#), [transform_color_jitter\(\)](#), [transform_convert_image_dtype\(\)](#), [transform_crop\(\)](#), [transform_five_crop\(\)](#), [transform_grayscale\(\)](#), [transform_hflip\(\)](#), [transform_linear_transformation\(\)](#), [transform_normalize\(\)](#), [transform_pad\(\)](#), [transform_perspective\(\)](#), [transform_random_affine\(\)](#), [transform_random_apply\(\)](#), [transform_random_choice\(\)](#), [transform_random_crop\(\)](#), [transform_random_erasing\(\)](#), [transform_random_grayscale\(\)](#), [transform_random_horizontal_flip\(\)](#), [transform_random_order\(\)](#), [transform_random_perspective\(\)](#), [transform_random_resized_crop\(\)](#), [transform_random_rotation\(\)](#), [transform_random_vertical_flip\(\)](#), [transform_resized_crop\(\)](#), [transform_resize\(\)](#), [transform_rgb_to_grayscale\(\)](#), [transform_rotate\(\)](#), [transform_to_tensor\(\)](#), [transform_vflip\(\)](#)

`transform_to_tensor` *Convert an image to a tensor*

Description

Converts a Magick Image or array (H x W x C) in the range [0, 255] to a torch_tensor of shape (C x H x W) in the range [0.0, 1.0]. In the other cases, tensors are returned without scaling.

Usage

```
transform_to_tensor(img)
```

Arguments

<code>img</code>	A magick-image, array or torch_tensor.
------------------	--

Note

Because the input image is scaled to [0.0, 1.0], this transformation should not be used when transforming target image masks.

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_vflip()`

<code>transform_vflip</code>	<i>Vertically flip a PIL Image or Tensor</i>
------------------------------	--

Description

Vertically flip a PIL Image or Tensor

Usage

```
transform_vflip(img)
```

Arguments

`img` A magick-image, array or torch_tensor.

See Also

Other transforms: `transform_adjust_brightness()`, `transform_adjust_contrast()`, `transform_adjust_gamma()`, `transform_adjust_hue()`, `transform_adjust_saturation()`, `transform_affine()`, `transform_center_crop()`, `transform_color_jitter()`, `transform_convert_image_dtype()`, `transform_crop()`, `transform_five_crop()`, `transform_grayscale()`, `transform_hflip()`, `transform_linear_transformation()`, `transform_normalize()`, `transform_pad()`, `transform_perspective()`, `transform_random_affine()`, `transform_random_apply()`, `transform_random_choice()`, `transform_random_crop()`, `transform_random_erasing()`, `transform_random_grayscale()`, `transform_random_horizontal_flip()`, `transform_random_order()`, `transform_random_perspective()`, `transform_random_resized_crop()`, `transform_random_rotation()`, `transform_random_vertical_flip()`, `transform_resized_crop()`, `transform_resize()`, `transform_rgb_to_grayscale()`, `transform_rotate()`, `transform_ten_crop()`, `transform_to_tensor()`

vision_make_grid *A simplified version of torchvision.utils.make_grid*

Description

Arranges a batch of (image) tensors in a grid, with optional padding between images. Expects a 4d mini-batch tensor of shape (B x C x H x W).

Usage

```
vision_make_grid(  
    tensor,  
    scale = TRUE,  
    num_rows = 8,  
    padding = 2,  
    pad_value = 0  
)
```

Arguments

tensor	tensor to arrange in grid.
scale	whether to normalize (min-max-scale) the input tensor.
num_rows	number of rows making up the grid (default 8).
padding	amount of padding between batch images (default 2).
pad_value	pixel value to use for padding.

Index

- * **datasets**
 - image_folder_dataset, 7
- * **dataset**
 - tiny_imagenet_dataset, 14
- * **models**
 - model_alexnet, 9
 - model_mobilenet_v2, 11
 - model_resnet, 11
- * **transforms**
 - transform_adjust_brightness, 15
 - transform_adjust_contrast, 15
 - transform_adjust_gamma, 16
 - transform_adjust_hue, 17
 - transform_adjust_saturation, 18
 - transform_affine, 19
 - transform_center_crop, 20
 - transform_color_jitter, 21
 - transform_convert_image_dtype, 22
 - transform_crop, 22
 - transform_five_crop, 23
 - transform_grayscale, 24
 - transform_hflip, 25
 - transform_linear_transformation, 25
 - transform_normalize, 26
 - transform_pad, 27
 - transform_perspective, 28
 - transform_random_affine, 29
 - transform_random_apply, 30
 - transform_random_choice, 31
 - transform_random_crop, 32
 - transform_random_erasing, 33
 - transform_random_grayscale, 34
 - transform_random_horizontal_flip, 35
 - transform_random_order, 35
 - transform_random_perspective, 36
 - transform_random_resized_crop, 37
 - transform_random_rotation, 38
 - transform_random_vertical_flip, 39
 - transform_resize, 40
 - transform_resized_crop, 41
 - transform_rgb_to_grayscale, 42
 - transform_rotate, 42
 - transform_ten_crop, 43
 - transform_to_tensor, 44
 - transform_vflip, 45
- base_loader, 3
- browseURL, 14
- cifar100_dataset (cifar10_dataset), 3
- cifar10_dataset, 3
- D, 26
- draw_bounding_boxes, 4
- draw_keypoints, 5
- draw_segmentation_masks, 6
- image_folder_dataset, 7
- image_folder_dataset(), 14
- kmnist_dataset, 8
- magick::filter_types(), 28, 36, 37, 40, 41
- magick_loader, 8
- mnist_dataset, 9
- model_alexnet, 9, 11, 12
- model_inception_v3, 10
- model_mobilenet_v2, 10, 11, 12
- model_resnet, 10, 11, 11
- model_resnet101 (model_resnet), 11
- model_resnet152 (model_resnet), 11
- model_resnet18 (model_resnet), 11
- model_resnet34 (model_resnet), 11
- model_resnet50 (model_resnet), 11
- model_resnext101_32x8d (model_resnet), 11
- model_resnext50_32x4d (model_resnet), 11
- model_vgg, 12

- model_vgg11 (model_vgg), 12
- model_vgg11_bn (model_vgg), 12
- model_vgg13 (model_vgg), 12
- model_vgg13_bn (model_vgg), 12
- model_vgg16 (model_vgg), 12
- model_vgg16_bn (model_vgg), 12
- model_vgg19 (model_vgg), 12
- model_vgg19_bn (model_vgg), 12
- model_wide_resnet101_2 (model_resnet), 11
- model_wide_resnet50_2 (model_resnet), 11

- tensor_image_browse, 13
- tensor_image_display, 14
- tiny_imagenet_dataset, 14
- transform_adjust_brightness, 15, 16–18, 20–31, 33–45
- transform_adjust_contrast, 15, 15, 17, 18, 20–31, 33–45
- transform_adjust_gamma, 15, 16, 16, 17, 18, 20–31, 33–45
- transform_adjust_hue, 15–17, 17, 18, 20–31, 33–45
- transform_adjust_saturation, 15–17, 18, 20–31, 33–45
- transform_affine, 15–18, 19, 20–31, 33–45
- transform_center_crop, 15–18, 20, 20, 21–31, 33–45
- transform_color_jitter, 15–18, 20, 21, 22–31, 33–45
- transform_convert_image_dtype, 15–18, 20, 21, 22, 23–31, 33–45
- transform_crop, 15–18, 20–22, 22, 24–31, 33–45
- transform_five_crop, 15–18, 20–23, 23, 24–31, 33–45
- transform_grayscale, 15–18, 20–24, 24, 25–31, 33–45
- transform_hflip, 15–18, 20–24, 25, 26–31, 33–45
- transform_linear_transformation, 15–18, 20–25, 25, 27–31, 33–45
- transform_normalize, 15–18, 20–26, 26, 28–31, 33–45
- transform_pad, 15–18, 20–27, 27, 29–31, 33–45
- transform_perspective, 15–18, 20–28, 28, 30, 31, 33–45
- transform_random_affine, 15–18, 20–29, 29, 31, 33–45
- transform_random_apply, 15–18, 20–30, 30, 31, 33–45
- transform_random_choice, 15–18, 20–31, 31, 33–45
- transform_random_crop, 15–18, 20–31, 32, 34–45
- transform_random_crop(), 7
- transform_random_erasing, 15–18, 20–31, 33, 33, 34–45
- transform_random_grayscale, 15–18, 20–31, 33, 34, 34, 35–45
- transform_random_horizontal_flip, 15–18, 20–31, 33, 34, 35, 36–45
- transform_random_order, 15–18, 20–31, 33–35, 35, 37–45
- transform_random_perspective, 15–18, 20–31, 33–36, 36, 38–45
- transform_random_resized_crop, 15–18, 20–31, 33–37, 37, 39–45
- transform_random_rotation, 15–18, 20–31, 33–38, 38, 40–45
- transform_random_vertical_flip, 15–18, 20–31, 33–39, 39, 40–45
- transform_resize, 15–18, 20–31, 33–40, 40, 41–45
- transform_resized_crop, 15–18, 20–31, 33–40, 41, 42–45
- transform_rgb_to_grayscale, 15–18, 20–31, 33–41, 42, 43–45
- transform_rotate, 15–18, 20–31, 33–42, 42, 44, 45
- transform_ten_crop, 15–18, 20–31, 33–43, 43, 45
- transform_to_tensor, 15–18, 20–31, 33–44, 44, 45
- transform_vflip, 15–18, 20–31, 33–45, 45
- vision_make_grid, 46