

Note to reader

This notebook has been set up s.t. the activation functions and learning rate experiments can be performed.

Import modules + Check GPU

```
In [12]: import torch
import torchvision
from torch import nn
import torch.nn.functional as F
from torch.utils.data import DataLoader, Dataset
import os
from PIL import Image
from torchvision.io import read_image
from torchvision.transforms import Resize, Compose, ToTensor, Normalize
import numpy as np
import skimage
import matplotlib.pyplot as plt
import time
from skimage import io
from tqdm import tqdm
import scipy.ndimage
from torch.utils.tensorboard import SummaryWriter

# for SSIM
import math

# for beta selection
import random
```

```
In [13]: print("GPU available: {}".format(torch.cuda.is_available()))
print("Device: {}".format(torch.cuda.get_device_name(0)))
```

GPU available: True
Device: Tesla K80

Data Generation

```
In [14]: def isotropic_diffusion(img, niter=1, kappa=50, gamma=0.1, voxelspacing=None):

    # initialize output array
    out = np.array(img, dtype=np.float32, copy=True)

    # set default voxel spacing if not supplied
    if voxelspacing is None:
        voxelspacing = tuple([1.] * img.ndim)

    # initialize some internal variables
    deltas = [np.zeros_like(out) for _ in range(out.ndim)]

    time = 0
```

```

results_pixels = []
results_dIdt = []
results_time = []

results_pixels.append(out.astype(img.dtype))
results_time.append(time)
#results_dIdt.append(np.zeros_like(out))

for iter in tqdm(range(niter)):
    # calculate the diffs
    for i in range(out.ndim):
        slicer = [slice(None, -1) if j == i else slice(None) for j in range(out.ndim)]
        diff_local = np.diff(out, axis=i)
        deltas[i][tuple(slicer)] = diff_local

    matrices = [delta for delta, spacing in zip(deltas, voxelspacing)]

    # second derivative
    for i in range(out.ndim):
        slicer = [slice(1, None) if j == i else slice(None) for j in range(out.ndim)]
        matrices[i][tuple(slicer)] = np.diff(matrices[i], axis=i)

    dIdt = np.sum(matrices, axis=0)
    #print(dIdt)

    # update the image
    out += gamma * (dIdt)
    time += gamma

    results_dIdt.append(dIdt.astype(img.dtype))
    if iter < niter - 1:
        results_pixels.append(out.astype(img.dtype))
        results_time.append(time)

return results_pixels, results_dIdt, results_time

def get_mgrid(sidelen=256, dim=2):

    '''Generates a flattened grid of (x,y,...) coordinates in a range of -1 to 1
    sidelen: int
    dim: int'''

    tensors = tuple(dim * [torch.linspace(-1, 1, steps=sidelen)])
    mgrid = torch.stack(torch.meshgrid(*tensors), dim=-1)
    mgrid = mgrid.reshape(-1, dim)

    return mgrid

class ImageFitting(Dataset):

    def __init__(self, img_path, niter):

        self.transform = Compose([
            Resize(256),
            ToTensor(),
            Normalize(torch.Tensor([0.5]), torch.Tensor([0.5]))
        ])
        self.coords = get_mgrid()

```

```

        print("-----Generating Data-----")
        self.base_img = io.imread(img_path)
        self.imgs_pixels, self.imgs_dIdt, self.imgs_time = isotropic_diffusion()

        print("-----Finished-----")

        self.len = len(self.imgs_pixels)

    def __len__(self):

        return self.len

    def __getitem__(self, idx):

        image = self.imgs_pixels[idx]
        image = self.transform(Image.fromarray(image))

        pixels = image.permute(1, 2, 0).view(-1, 1)
        step_val = torch.full((self.coords.size(0), 1), self.imgs_time[idx])

        model_input = torch.cat((self.coords, step_val), 1)

        # Compute gradient and laplacian
        grads_x = scipy.ndimage.sobel(image.numpy(), axis=1).squeeze(0)[..., None]
        grads_y = scipy.ndimage.sobel(image.numpy(), axis=2).squeeze(0)[..., None]
        grads_x, grads_y = torch.from_numpy(grads_x), torch.from_numpy(grads_y)

        grads = torch.stack((grads_x, grads_y), dim=-1).view(-1, 2)
        laplace = scipy.ndimage.laplace(image.numpy()).squeeze(0)[..., None]
        laplace = torch.from_numpy(laplace).view(-1, 1)

        dIdt = torch.from_numpy(self.imgs_dIdt[idx])
        dIdt = dIdt.permute(0, 1).view(-1)

        return model_input, {'pixels':pixels, 'grads':grads, 'laplace':laplace},

```

Loss Calculation

In [15]:

```

def computeJacobianFull(x, outputs, create_graph):

    dy_dx = torch.autograd.grad(outputs=outputs, inputs=x, grad_outputs=torch.ones_like(outputs),
                                retain_graph=True, create_graph=create_graph, allow_unused=True)[0]

    dy_dx = dy_dx.view(outputs.size(0), outputs.size(1), dy_dx.size(2))

    return dy_dx

def computeLaplaceFull(x, jacobian, create_graph):

    div = 0
    for j in range(jacobian.size(-1)):

        dy_dx2 = torch.autograd.grad(outputs=jacobian[:, :, j], inputs=x, grad_outputs=torch.ones_like(jacobian[:, :, j]),
                                    retain_graph=True, create_graph=create_graph)[0][..., j:j+1]

        div += dy_dx2

    return div

```

```

def calcLoss(coords, model_output, gt):

    pixel_loss = ((model_output - gt['pixels'])**2).mean()

    gradients = computeJacobianFull(coords, model_output, create_graph=True)
    grad_loss = ((gradients[:, :, :-1] - gt['grads']).pow(2).sum(-1)).mean()

    laplacian = computeLaplaceFull(coords, gradients[:, :, :-1], create_graph=False)
    laplacian_loss = ((laplacian - gt['laplace'])**2).mean()

    dIdt_loss = ((gradients[:, :, -1] - gt['dIdt'])**2).mean()

    pixel_ssim = mean_ssim(gt['pixels'][0].cpu().view(1, 256, 256).detach(), model_output)

    grad_ssim = mean_ssim(gt['grads'][0].norm(dim=-1).cpu().view(1, 256, 256).detach())

    laplacian_ssim = mean_ssim(gt['laplace'][0].cpu().view(1, 256, 256).detach())

    dIdt_ssim = mean_ssim(gt['dIdt'][0].cpu().view(1, 256, 256).float().detach())

    return pixel_loss, grad_loss, laplacian_loss, dIdt_loss, pixel_ssim, grad_ssim, laplacian_loss, dIdt_loss

```

SSIM (Structural Similarity Index Measure)

original SSIM paper: <https://www.cns.nyu.edu/pub/eero/wang03-reprint.pdf> \ code source: <https://github.com/pranjaldatta/SSIM-PyTorch> \ explanation: <https://medium.com/srm-mic/all-about-structural-similarity-index-ssim-theory-code-in-pytorch-6551b455541e>

In [16]:

```

def gaussian(window_size=11, sigma=1.5):
    """
    Generates a list of Tensor values drawn from a gaussian distribution with standard deviation = sigma and sum of all elements = 1.

    Length of list = window_size
    """
    gauss = torch.Tensor([math.exp(-(x - window_size//2)**2/float(2*sigma**2)) for x in range(window_size)])
    return gauss/gauss.sum()

```

In [17]:

```

def create_window(window_size=11, channel=1):

    # Generate an 1D tensor containing values sampled from a gaussian distribution
    _1d_window = gaussian(window_size=window_size, sigma=1.5).unsqueeze(1)

    # Converting to 2D
    _2d_window = _1d_window.mm(_1d_window.t()).float().unsqueeze(0).unsqueeze(0)

    window = torch.Tensor(_2d_window.expand(channel, 1, window_size, window_size))

    return window

```

In [18]:

```

# mean SSIM with SSIM applied locally over moving windows
# output = 1: the same image, output = 0 (or -1): very different
def mean_ssim(img1, img2, val_range, window_size=11, window=None, size_average=True, L=255):
    return ssim(img1, img2, val_range, window_size=window_size, window=window, size_average=size_average, L=L)

```

```

pad = window_size // 2

try:
    _, channels, height, width = img1.size()
except:
    channels, height, width = img1.size()

# if window is not provided, init one
if window is None:
    real_size = min(window_size, height, width) # window should be atleast
    window = create_window(real_size, channel=channels).to(img1.device)

# calculating the mu parameter (locally) for both images using a gaussian i
# calculates the luminosity params
mul1 = F.conv2d(img1, window, padding=pad, groups=channels)
mul2 = F.conv2d(img2, window, padding=pad, groups=channels)

mul1_sq = mul1 ** 2
mul2_sq = mul2 ** 2
mul12 = mul1 * mul2

# now we calculate the sigma square parameter
# Sigma deals with the contrast component
sigma1_sq = F.conv2d(img1 * img1, window, padding=pad, groups=channels) - n
sigma2_sq = F.conv2d(img2 * img2, window, padding=pad, groups=channels) - n
sigma12 = F.conv2d(img1 * img2, window, padding=pad, groups=channels) - mu

# Some constants for stability
C1 = (0.01) ** 2 # NOTE: Removed L from here (ref PT implementation)
C2 = (0.03) ** 2

contrast_metric = (2.0 * sigma12 + C2) / (sigma1_sq + sigma2_sq + C2)
contrast_metric = torch.mean(contrast_metric)

numerator1 = 2 * mul12 + C1
numerator2 = 2 * sigma12 + C2
denominator1 = mul1_sq + mul2_sq + C1
denominator2 = sigma1_sq + sigma2_sq + C2

ssim_score = (numerator1 * numerator2) / (denominator1 * denominator2)

if size_average:
    ret = ssim_score.mean()
else:
    ret = ssim_score.mean(1).mean(1).mean(1)

if full:
    return ret, contrast_metric

return ret

```

In [19]: # Helper functions to convert to Tensors
`tensorify = lambda x: torch.Tensor(x.transpose((1, 0))).unsqueeze(0).float().di`

In [20]: # ### Example Usage ###
`# img_path_temp = 'original/cameraman.png'
img1 = io.imread(img_path_temp)
img2 = io.imread(img_path_temp)`

```
# # Check SSIM score of True image vs False Image
# _img1 = tensorify(img1)
# _img2 = tensorify(img2)
# true_vs_false = mean_ssim(_img1, _img2, val_range=255)
# print("True vs False Image SSIM Score:", true_vs_false)
```

SIREN Network Architecture

```
In [21]: class SineLayer(nn.Module):
    # See paper sec. 3.2, final paragraph, and supplement Sec. 1.5 for discussion

    # If is_first=True, omega_0 is a frequency factor which simply multiplies the
    # nonlinearity. Different signals may require different omega_0 in the first
    # hyperparameter.

    # If is_first=False, then the weights will be divided by omega_0 so as to keep
    # activations constant, but boost gradients to the weight matrix (see supplement)

    def __init__(self, in_features, out_features, bias=True,
                 is_first=False, omega_0=30):
        super().__init__()
        self.omega_0 = omega_0
        self.is_first = is_first

        self.in_features = in_features
        self.linear = nn.Linear(in_features, out_features, bias=bias)

        self.init_weights()

    def init_weights(self):
        with torch.no_grad():
            if self.is_first:
                self.linear.weight.uniform_(-1 / self.in_features,
                                            1 / self.in_features)
            else:
                self.linear.weight.uniform_(-np.sqrt(6 / self.in_features) / self.omega_0,
                                            np.sqrt(6 / self.in_features) / self.omega_0)

    def forward(self, input):
        return torch.sin(self.omega_0 * self.linear(input))

    def forward_with_intermediate(self, input):
        # For visualization of activation distributions
        intermediate = self.omega_0 * self.linear(input)
        return torch.sin(intermediate), intermediate

class Siren(nn.Module):
    def __init__(self, in_features, hidden_features, hidden_layers, out_features,
                 first_omega_0=30, hidden_omega_0=30.):
        super().__init__()

        self.net = []
        self.net.append(SineLayer(in_features, hidden_features,
                               is_first=True, omega_0=first_omega_0))

        for i in range(hidden_layers):
```

```

        self.net.append(SineLayer(hidden_features, hidden_features,
                                is_first=False, omega_0=hidden_omega_0))

    if outermost_linear:
        final_linear = nn.Linear(hidden_features, out_features)

        with torch.no_grad():
            final_linear.weight.uniform_(-np.sqrt(6 / hidden_features) / hi
                                         np.sqrt(6 / hidden_features) / hi

        self.net.append(final_linear)
    else:
        self.net.append(SineLayer(hidden_features, out_features,
                                is_first=False, omega_0=hidden_omega_0))

self.net = nn.Sequential(*self.net)

def forward(self, coords):
    coords = coords.clone().detach().requires_grad_(True) # allows to take
    output = self.net(coords)
    return output, coords

def forward_with_activations(self, coords, retain_grad=False):
    '''Returns not only model output, but also intermediate activations.
    Only used for visualizing activations later!'''
    activations = OrderedDict()

    activation_count = 0
    x = coords.clone().detach().requires_grad_(True)
    activations['input'] = x
    for i, layer in enumerate(self.net):
        if isinstance(layer, SineLayer):
            x, intermed = layer.forward_with_intermediate(x)

            if retain_grad:
                x.retain_grad()
                intermed.retain_grad()

            activations['_'.join((str(layer.__class__), "%d" % activation_count))]
            activation_count += 1
        else:
            x = layer(x)

            if retain_grad:
                x.retain_grad()

            activations['_'.join((str(layer.__class__), "%d" % activation_count))]
            activation_count += 1

    return activations

```

ELU Network Architecture

In [22]: `class ELULayer(nn.Module):`

```

    def __init__(self, in_features, out_features, bias=True):
        super().__init__()

```

```

        self.in_features = in_features
        self.linear = nn.Linear(in_features, out_features, bias=bias)

        self.init_weights()

    def init_weights(self):
        with torch.no_grad():
            nn.init.xavier_uniform_(self.linear.weight)

    def forward(self, input):
        return F.elu(self.linear(input))

    def forward_with_intermediate(self, input):
        # For visualization of activation distributions
        intermediate = self.linear(input)
        return F.elu(intermediate), intermediate


class Base(nn.Module):
    def __init__(self, in_features, hidden_features, hidden_layers, out_features,
                 first_omega_0=30, hidden_omega_0=30.):
        super().__init__()

        self.net = []
        self.net.append(ELULayer(in_features, hidden_features))

        for i in range(hidden_layers):
            self.net.append(ELULayer(hidden_features, hidden_features))

        if outermost_linear:
            final_linear = nn.Linear(hidden_features, out_features)

            with torch.no_grad():
                nn.init.xavier_uniform_(final_linear.weight)

            self.net.append(final_linear)
        else:
            self.net.append(ELULayer(hidden_features, out_features,
                                    is_first=False, omega_0=hidden_omega_0))

        self.net = nn.Sequential(*self.net)

    def forward(self, coords):
        coords = coords.clone().detach().requires_grad_(True) # allows to take
        output = self.net(coords)
        return output, coords

    def forward_with_activations(self, coords, retain_grad=False):
        '''Returns not only model output, but also intermediate activations.
        Only used for visualizing activations later!'''
        activations = OrderedDict()

        activation_count = 0
        x = coords.clone().detach().requires_grad_(True)
        activations['input'] = x
        for i, layer in enumerate(self.net):
            if isinstance(layer, SineLayer):
                x, intermed = layer.forward_with_intermediate(x)

            if retain_grad:

```

```

        x._retain_grad()
        intermed._retain_grad()

    activations['_'].join((str(layer.__class__), "%d" % activation_count))
    activation_count += 1
else:
    x = layer(x)

    if retain_grad:
        x._retain_grad()

    activations['_'].join((str(layer.__class__), "%d" % activation_count))
    activation_count += 1

return activations

```

Save video

```

In [23]: import shutil
import subprocess

def output_video(net, img_path, niter, vidName='video_name.mp4'):

    image = ImageFitting(img_path=img_path, niter=niter)
    dataloader = DataLoader(image, batch_size=1, pin_memory=True, num_workers=0)

    net.cuda()

    if os.path.exists("tmp"):
        shutil.rmtree("tmp")
    os.makedirs("tmp")

    for step, batch in tqdm(enumerate(dataloader)):

        model_input = batch[0].cuda()
        gt = {key: value.cuda() for key, value in batch[1].items()}

        model_output, coords = net(model_input)
        img_grad = computeJacobianFull(coords, model_output, create_graph=True)
        img_laplacian = computeLaplaceFull(coords, img_grad, create_graph=False)

        fig, axes = plt.subplots(2,4, figsize=(18,6))
        axes[0,0].imshow(gt['pixels'][0].cpu().view(256,256).detach().numpy())
        axes[0,1].imshow(gt['grads'][0].norm(dim=-1).cpu().view(256,256).detach().numpy())
        axes[0,2].imshow(gt['laplace'][0].cpu().view(256,256).detach().numpy())
        axes[0,3].imshow(gt['dIdt'][0].cpu().view(256,256).detach().numpy())
        axes[1,0].imshow(model_output[0].cpu().view(256,256).detach().numpy())
        axes[1,1].imshow(img_grad[0][:,:-1].norm(dim=-1).cpu().view(256,256).detach().numpy())
        axes[1,2].imshow(img_laplacian[0].cpu().view(256,256).detach().numpy())
        axes[1,3].imshow(img_grad[0][:,-1].cpu().view(256,256).detach().numpy())

        fig.savefig("tmp/file%02d.png" % step)

    subprocess.call([
        'ffmpeg', '-framerate', '2', '-i', 'tmp/file%02d.png', '-r', '30', '-pix_fmt',
        vidName
    ])

```

```
shutil.rmtree("tmp")
```

Train Network

```
In [24]: def train(net, writer, img_path, niter, total_epochs=50, lr=[1e-4], beta_0=1, beta_1=0.9, beta_2=0.999, beta_3=0.9999, cyclic=False, decay_exp=False, decay_multi=False):

    """Args:
        net: Network to Train
        writer: SummaryWriter for logging
        img_path: path to default state image
        niter: number of steps to apply diffusion (0 means only 1 image)
        total_epochs: number of epochs to train
        beta_0: constant for loss on pixel value
        beta_1: constant for loss on gradients
        beta_2: constant for loss on laplacian
        beta_3: constant for loss on pixel time derivative
        cyclic: CyclicLearning rate (allows better learning)"""

    image = ImageFitting(img_path=img_path, niter=niter)
    dataloader = DataLoader(image, batch_size=1, pin_memory=True, num_workers=0)

    net.cuda()

    epochs_til_summary = 10 #UPDATE ACCORDINGLY
    steps_til_summary = 5 #UPDATE ACCORDINGLY

    optim = torch.optim.Adam(lr=lr[0], params=net.parameters())

    if decay_multi:
        m = np.floor(total_epochs/4)
        scheduler = torch.optim.lr_scheduler.MultiStepLR(optim, milestones=[m*4])

    if decay_exp:
        scheduler = torch.optim.lr_scheduler.ExponentialLR(optim, gamma=0.9)

    if cyclic:
        scheduler = torch.optim.lr_scheduler.CyclicLR(optim, base_lr=lr[1], max_lr=lr[2], step_size_up=1000, step_size_down=1000)

    print("-----Begin Training-----")
    for epoch in range(1, total_epochs + 1):

        epoch_loss = 0.0
        epoch_pixel_loss = 0.0
        epoch_grad_loss = 0.0
        epoch_laplacian_loss = 0.0
        epoch_dIdt_loss = 0.0

        epoch_pixel_ssim = 0.0
        epoch_grad_ssim = 0.0
        epoch_laplacian_ssim = 0.0
        epoch_dIdt_ssim = 0.0

        for step, batch in tqdm(enumerate(dataloader)):

            model_input = batch[0].cuda()
```

```

gt = {key: value.cuda() for key, value in batch[1].items()}

model_output, coords = net(model_input)

pixel_loss, grad_loss, laplacian_loss, dIdt_loss, pixel_ssim, grad_
loss = beta_0 * pixel_loss + beta_1 * grad_loss + beta_2 * laplacia
epoch_loss += model_output.shape[0] * loss.item()
epoch_pixel_loss += model_output.shape[0] * pixel_loss.item()
epoch_grad_loss += model_output.shape[0] * grad_loss.item()
epoch_laplacian_loss += model_output.shape[0] * laplacian_loss.item()
epoch_dIdt_loss += model_output.shape[0] * dIdt_loss.item()

epoch_pixel_ssim += model_output.shape[0] * pixel_ssim.item()
epoch_grad_ssim += model_output.shape[0] * grad_ssim.item()
epoch_laplacian_ssim += model_output.shape[0] * laplacian_ssim.item()
epoch_dIdt_ssim += model_output.shape[0] * dIdt_ssim.item()

if not epoch % epochs_til_summary and step % steps_til_summary == 0:
    pixel_output = model_output[0].view(1, -1, 256, 256)
    pixel_gt = gt['pixels'][0].view(1, -1, 256, 256)
    img_grid_pixel = torchvision.utils.make_grid(torch.cat((pixel_o
    img_grid_pixel = img_grid_pixel * 0.5 + 0.5
    writer.add_image('pixels', img_grid_pixel, epoch * len(dataloader))

    img_grad = computeJacobianFull(coords, model_output, create_gra
    grad_output = img_grad[0,:,::-1].norm(dim=-1).view(1, -1, 256, 2
    grad_gt = gt['grads'][0].norm(dim=-1).view(1, -1, 256, 256)
    img_grid_grad = torchvision.utils.make_grid(torch.cat((grad_g
    writer.add_image('grads', img_grid_grad, epoch * len(dataloader))

    img_laplacian = computeLaplaceFull(coords, img_grad, create_gra
    laplacian_output = img_laplacian[0].view(1, -1, 256, 256)
    laplacian_gt = gt['laplace'][0].view(1, -1, 256, 256)
    img_grid_laplacian = torchvision.utils.make_grid(torch.cat((lap
    writer.add_image('laplacians', img_grid_laplacian, epoch * len(dataloader))

    dIdt_output = img_grad[0,:,:-1].view(1, -1, 256, 256)
    dIdt_gt = gt['dIdt'][0].view(1, -1, 256, 256)
    img_grid_dIdt = torchvision.utils.make_grid(torch.cat((dIdt_g
    writer.add_image('dIdt', img_grid_dIdt, epoch * len(dataloader))

    # fig, axes = plt.subplots(2,4, figsize=(18,6))
    # axes[0,0].imshow(gt['pixels'][0].cpu().view(256,256).detach())
    # axes[0,1].imshow(gt['grads'][0].norm(dim=-1).cpu().view(256,256).det
    # axes[0,2].imshow(gt['laplace'][0].cpu().view(256,256).detach())
    # axes[0,3].imshow(gt['dIdt'][0].cpu().view(256,256).detach())
    # axes[1,0].imshow(model_output[0].cpu().view(256,256).detach())
    # axes[1,1].imshow(img_grad[0][:,:-1].norm(dim=-1).cpu().view(256,256).det
    # axes[1,2].imshow(img_laplacian[0].cpu().view(256,256).detach())
    # axes[1,3].imshow(img_grad[0][:,-1].cpu().view(256,256).detach())
    # plt.show()

    optim.zero_grad()
    loss.backward()
    optim.step()

```

```

        if cyclic or decay_exp or decay_multi:
            scheduler.step()

        # logging epoch loss
        writer.add_scalar('epoch_loss/total', epoch_loss/len(image), epoch)
        writer.add_scalar('epoch_loss/pixel', epoch_pixel_loss/len(image), epoch)
        writer.add_scalar('epoch_loss/grad', epoch_grad_loss/len(image), epoch)
        writer.add_scalar('epoch_loss/laplacian', epoch_laplacian_loss/len(image), epoch)
        writer.add_scalar('epoch_loss/dIdt', epoch_dIdt_loss/len(image), epoch)
        print("Epoch %d, Epoch loss: total %0.6f, pixel %0.6f, grad %0.6f, laplacian %0.6f, dIdt %0.6f" % (epoch, epoch_loss/len(image), epoch_pixel_loss/len(image), epoch_grad_loss/len(image), epoch_laplacian_loss/len(image), epoch_dIdt_loss/len(image)))

        # logging ssim loss
        writer.add_scalar('epoch_ssim/pixel', epoch_pixel_ssim/len(image), epoch)
        writer.add_scalar('epoch_ssim/grad', epoch_grad_ssim/len(image), epoch)
        writer.add_scalar('epoch_ssim/laplacian', epoch_laplacian_ssim/len(image), epoch)
        writer.add_scalar('epoch_ssim/dIdt', epoch_dIdt_ssim/len(image), epoch)
        print("Epoch %d, Epoch SSIM: pixel %0.6f, grad %0.6f, laplacian %0.6f, dIdt %0.6f" % (epoch, epoch_pixel_ssim/len(image), epoch_grad_ssim/len(image), epoch_laplacian_ssim/len(image), epoch_dIdt_ssim/len(image)))

    writer.add_graph(net, model_input)
    print("-----Finished-----")

```

Baselines & Activations Experiments

SIREN Baselines

```

In [33]: torch.cuda.empty_cache()

In [34]: total_epochs = 20

In [35]: # SIREN, learn only with the observed pixel values
writer = SummaryWriter('runs/siren/cameraman_experiment_pixels')

img_siren = Siren(in_features=3, out_features=1, hidden_features=512,
                  hidden_layers=3, outermost_linear=True)

train(img_siren, writer, img_path='original/cameraman.png', niter=10, total_epochs=total_epochs,
      beta_0=1, beta_1=0, beta_2=0, beta_3=0)

writer.close()

output_video(img_siren, img_path='original/cameraman.png', niter=10, vidName='vid.mp4')

```

-----Generating Data-----

100%|██████████| 10/10 [00:00<00:00, 1086.16it/s]

-----Finished-----

-----Begin Training-----

10it [00:28, 2.82s/it]

Epoch 1, Epoch loss: total 0.243860, pixel 0.243860, grad 9.191725, laplacian 439.269443, dIdt 17894.582422

Epoch 1, Epoch SSIM: pixel 0.151980, grad 0.018551, laplacian 0.000019, dIdt -0.000055

10it [00:28, 2.88s/it]

```
Epoch 2, Epoch loss: total 0.078952, pixel 0.078952, grad 14.699332, laplacian  
8362.296680, dIdt 17902.280859  
Epoch 2, Epoch SSIM: pixel 0.436166, grad 0.022590, laplacian 0.000002, dIdt  
0.000450  
10it [00:30, 3.02s/it]  
Epoch 3, Epoch loss: total 0.084746, pixel 0.084746, grad 16.794024, laplacian  
16416.388721, dIdt 17923.077832  
Epoch 3, Epoch SSIM: pixel 0.386629, grad 0.017952, laplacian 0.000002, dIdt  
0.000188  
10it [00:28, 2.85s/it]  
Epoch 4, Epoch loss: total 0.049689, pixel 0.049689, grad 16.508193, laplacian  
16701.580762, dIdt 17917.758301  
Epoch 4, Epoch SSIM: pixel 0.449591, grad 0.017564, laplacian 0.000001, dIdt  
0.000105  
10it [00:28, 2.86s/it]  
Epoch 5, Epoch loss: total 0.042359, pixel 0.042359, grad 20.316391, laplacian  
27292.120605, dIdt 17943.843359  
Epoch 5, Epoch SSIM: pixel 0.456581, grad 0.025756, laplacian 0.000000, dIdt  
0.000107  
10it [00:28, 2.86s/it]  
Epoch 6, Epoch loss: total 0.039738, pixel 0.039738, grad 16.622386, laplacian  
23044.461328, dIdt 17927.975488  
Epoch 6, Epoch SSIM: pixel 0.471818, grad 0.033255, laplacian 0.000001, dIdt  
0.000053  
10it [00:28, 2.85s/it]  
Epoch 7, Epoch loss: total 0.039107, pixel 0.039107, grad 21.187362, laplacian  
50773.970508, dIdt 17929.391699  
Epoch 7, Epoch SSIM: pixel 0.453665, grad 0.031063, laplacian 0.000001, dIdt  
0.000199  
10it [00:30, 3.01s/it]  
Epoch 8, Epoch loss: total 0.037570, pixel 0.037570, grad 19.481895, laplacian  
42403.822852, dIdt 17905.571680  
Epoch 8, Epoch SSIM: pixel 0.501973, grad 0.037138, laplacian 0.000001, dIdt  
0.000165  
10it [00:28, 2.86s/it]  
Epoch 9, Epoch loss: total 0.028879, pixel 0.028879, grad 18.154066, laplacian  
46431.783398, dIdt 17942.372266  
Epoch 9, Epoch SSIM: pixel 0.493399, grad 0.044429, laplacian 0.000001, dIdt  
0.000171  
10it [00:32, 3.21s/it]  
Epoch 10, Epoch loss: total 0.028872, pixel 0.028872, grad 22.606762, laplacian  
76453.366797, dIdt 17927.585059  
Epoch 10, Epoch SSIM: pixel 0.530416, grad 0.037862, laplacian -0.000000, dIdt  
0.000134  
10it [00:28, 2.88s/it]  
Epoch 11, Epoch loss: total 0.029001, pixel 0.029001, grad 24.652927, laplacian  
79581.339453, dIdt 17916.106348  
Epoch 11, Epoch SSIM: pixel 0.528929, grad 0.041143, laplacian 0.000001, dIdt  
0.000167  
10it [00:30, 3.02s/it]  
Epoch 12, Epoch loss: total 0.024079, pixel 0.024079, grad 18.634961, laplacian  
56257.318359, dIdt 17943.914453  
Epoch 12, Epoch SSIM: pixel 0.522668, grad 0.053352, laplacian 0.000001, dIdt  
0.000156  
10it [00:28, 2.84s/it]
```

```
Epoch 13, Epoch loss: total 0.018237, pixel 0.018237, grad 20.482732, laplacian 75648.114844, dIdt 17915.543652
Epoch 13, Epoch SSIM: pixel 0.578941, grad 0.056742, laplacian 0.000001, dIdt 0.000096
10it [00:28, 2.88s/it]
Epoch 14, Epoch loss: total 0.016404, pixel 0.016404, grad 23.604815, laplacian 103802.437500, dIdt 17935.465332
Epoch 14, Epoch SSIM: pixel 0.588350, grad 0.056727, laplacian 0.000000, dIdt 0.000117
10it [00:28, 2.85s/it]
Epoch 15, Epoch loss: total 0.016370, pixel 0.016370, grad 22.544994, laplacian 105237.575000, dIdt 17913.461035
Epoch 15, Epoch SSIM: pixel 0.603084, grad 0.063026, laplacian 0.000001, dIdt 0.000154
10it [00:28, 2.87s/it]
Epoch 16, Epoch loss: total 0.015617, pixel 0.015617, grad 24.800620, laplacian 126852.080469, dIdt 17936.869434
Epoch 16, Epoch SSIM: pixel 0.595006, grad 0.062599, laplacian 0.000001, dIdt 0.000124
10it [00:30, 3.02s/it]
Epoch 17, Epoch loss: total 0.015202, pixel 0.015202, grad 27.287809, laplacian 133260.321875, dIdt 17920.603223
Epoch 17, Epoch SSIM: pixel 0.620549, grad 0.065064, laplacian 0.000001, dIdt 0.000136
10it [00:28, 2.86s/it]
Epoch 18, Epoch loss: total 0.015987, pixel 0.015987, grad 27.710103, laplacian 134401.923437, dIdt 17925.205469
Epoch 18, Epoch SSIM: pixel 0.621230, grad 0.064321, laplacian 0.000001, dIdt 0.000150
10it [00:28, 2.88s/it]
Epoch 19, Epoch loss: total 0.014987, pixel 0.014987, grad 27.646232, laplacian 128934.535156, dIdt 17927.267188
Epoch 19, Epoch SSIM: pixel 0.630013, grad 0.069422, laplacian 0.000000, dIdt 0.000153
10it [00:32, 3.22s/it]
Epoch 20, Epoch loss: total 0.013884, pixel 0.013884, grad 25.672663, laplacian 115680.806250, dIdt 17922.442578
Epoch 20, Epoch SSIM: pixel 0.632722, grad 0.070358, laplacian 0.000001, dIdt 0.000191
-----Finished-----
-----Generating Data-----
100%|██████████| 10/10 [00:00<00:00, 1264.64it/s]
-----Finished-----
```

```

10it [00:19,  1.93s/it]
ffmpeg version 4.1.9-0+deb10u1 Copyright (c) 2000-2022 the FFmpeg developers
  built with gcc 8 (Debian 8.3.0-6)
  configuration: --prefix=/usr --extra-version=0+deb10u1 --toolchain=hardened
  --libdir=/usr/lib/x86_64-linux-gnu --incdir=/usr/include/x86_64-linux-gnu --arch=amd64
  --enable-gpl --disable-stripping --enable-avresample --disable-filter=resample
  --enable-avisynth --enable-gnutls --enable-ladspa --enable-libaom --enable-libass
  --enable-libbluray --enable-libbs2b --enable-libcaca --enable-libcdio --enable-libcodec2
  --enable-libflite --enable-libfontconfig --enable-libfreetype --enable-libfribidi
  --enable-libgme --enable-libgsm --enable-libjack --enable-libmp3lame --enable-libmysofa
  --enable-libopenjpeg --enable-libopenmpt --enable-libopus --enable-libpulse
  --enable-librsvg --enable-librubberband --enable-libshine --enable-libsnappy
  --enable-libsoxr --enable-libspeex --enable-libssh --enable-libtheora --enable-libtwolame
  --enable-libvidstab --enable-libvorbis --enable-libvpx --enable-libwavpack --enable-libwebp
  --enable-libx265 --enable-libxml2 --enable-libxvid --enable-libzmq --enable-libzvbi --enable-lv2
  --enable-omx --enable-openal --enable-opengl --enable-sdl2 --enable-libdc1394
  --enable-libdrm --enable-libiec61883 --enable-chromaprint --enable-frei0r --enable-libx264
  --enable-shared

  libavutil      56. 22.100 / 56. 22.100
  libavcodec     58. 35.100 / 58. 35.100
  libavformat    58. 20.100 / 58. 20.100
  libavdevice    58.  5.100 / 58.  5.100
  libavfilter     7. 40.101 /  7. 40.101
  libavresample   4.  0.  0 /  4.  0.  0
  libswscale      5.  3.100 /  5.  3.100
  libswresample   3.  3.100 /  3.  3.100
  libpostproc    55.  3.100 / 55.  3.100

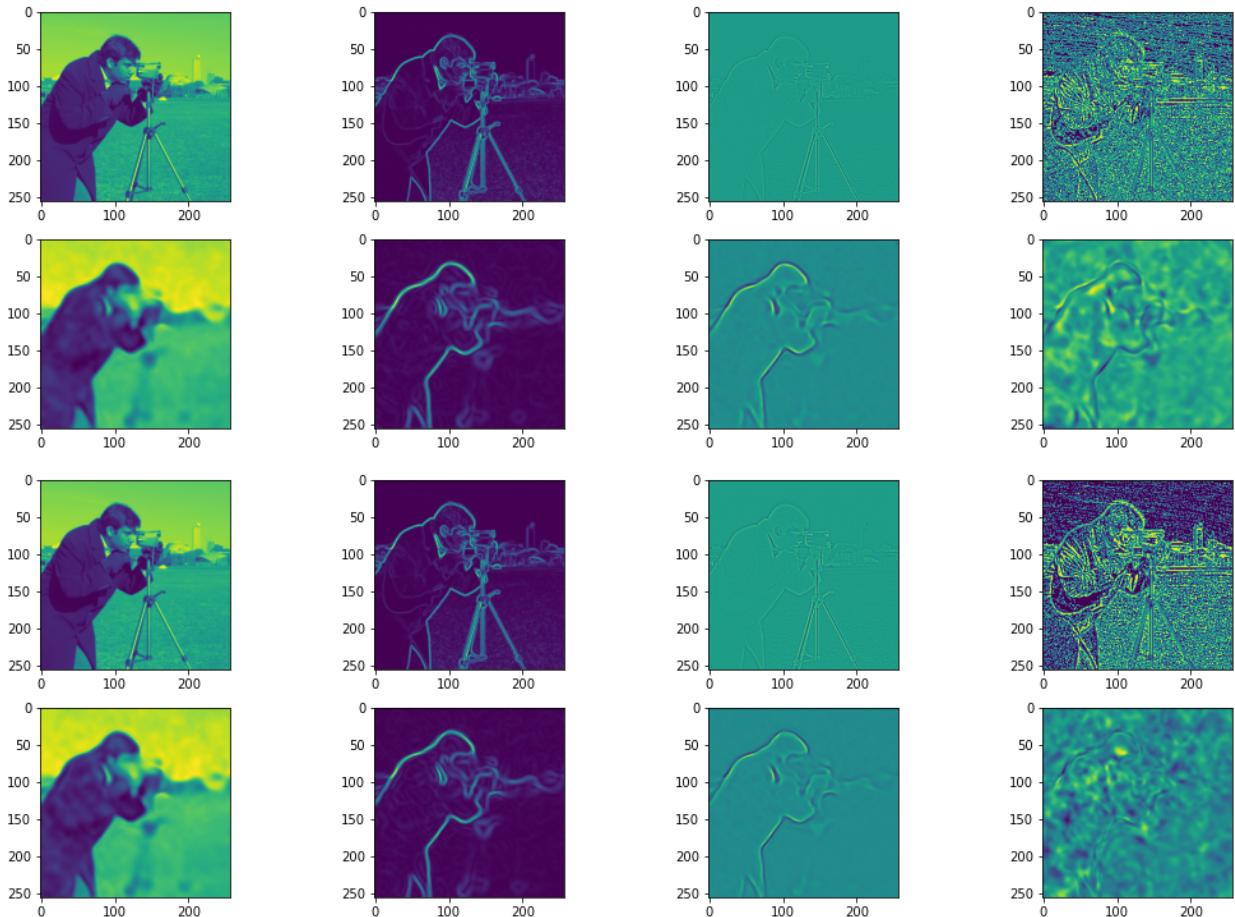
Input #0, image2, from 'tmp/file%02d.png':
  Duration: 00:00:05.00, start: 0.000000, bitrate: N/A
    Stream #0:0: Video: png, rgba(pc), 1296x432 [SAR 2835:2835 DAR 3:1], 2 fps,
  2 tbr, 2 tbn, 2 tbc
  Stream mapping:
    Stream #0:0 -> #0:0 (png (native) -> h264 (libx264))
  Press [q] to stop, [?] for help
  [libx264 @ 0x55dbdbd3df00] using SAR=1/1
  [libx264 @ 0x55dbdbd3df00] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2
  AVX FMA3 BMI2 AVX2
  [libx264 @ 0x55dbdbd3df00] profile High, level 3.1
  [libx264 @ 0x55dbdbd3df00] 264 - core 155 r2917 0a84d98 - H.264/MPEG-4 AVC cod
  ec - Copyleft 2003-2018 - http://www.videolan.org/x264.html - options: cabac=1
  ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00:0.00 mi
  xed_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast
  _pskip=1 chroma_qp_offset=-2 threads=3 lookahead_threads=1 sliced_threads=0 nr
  =0 decimate=1 interlaced=0 bluray_compat=0 constrained_intra=0 bframes=3 b_pyr
  amid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 k
  eyint_min=25 scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=2
  3.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ratio=1.40 aq=1:1.00
  Output #0, mp4, to 'videos/siren/cameraman_experiment_pixels_video.mp4':
    Metadata:
      encoder : Lavf58.20.100
      Stream #0:0: Video: h264 (libx264) (avc1 / 0x31637661), yuv420p, 1296x432
  [SAR 1:1 DAR 3:1], q=-1--1, 30 fps, 15360 tbn, 30 tbc
      Metadata:
        encoder : Lavc58.35.100 libx264
      Side data:
        cpb: bitrate max/min/avg: 0/0/0 buffer size: 0 vbv_delay: -1
        frame= 150 fps=102 q=-1.0 Lsize= 212kB time=00:00:04.90 bitrate= 354.3kbi
        ts/s dup=140 drop=0 speed=3.33x
        video:209kB audio:0kB subtitle:0kB other streams:0kB global headers:0kB muxing

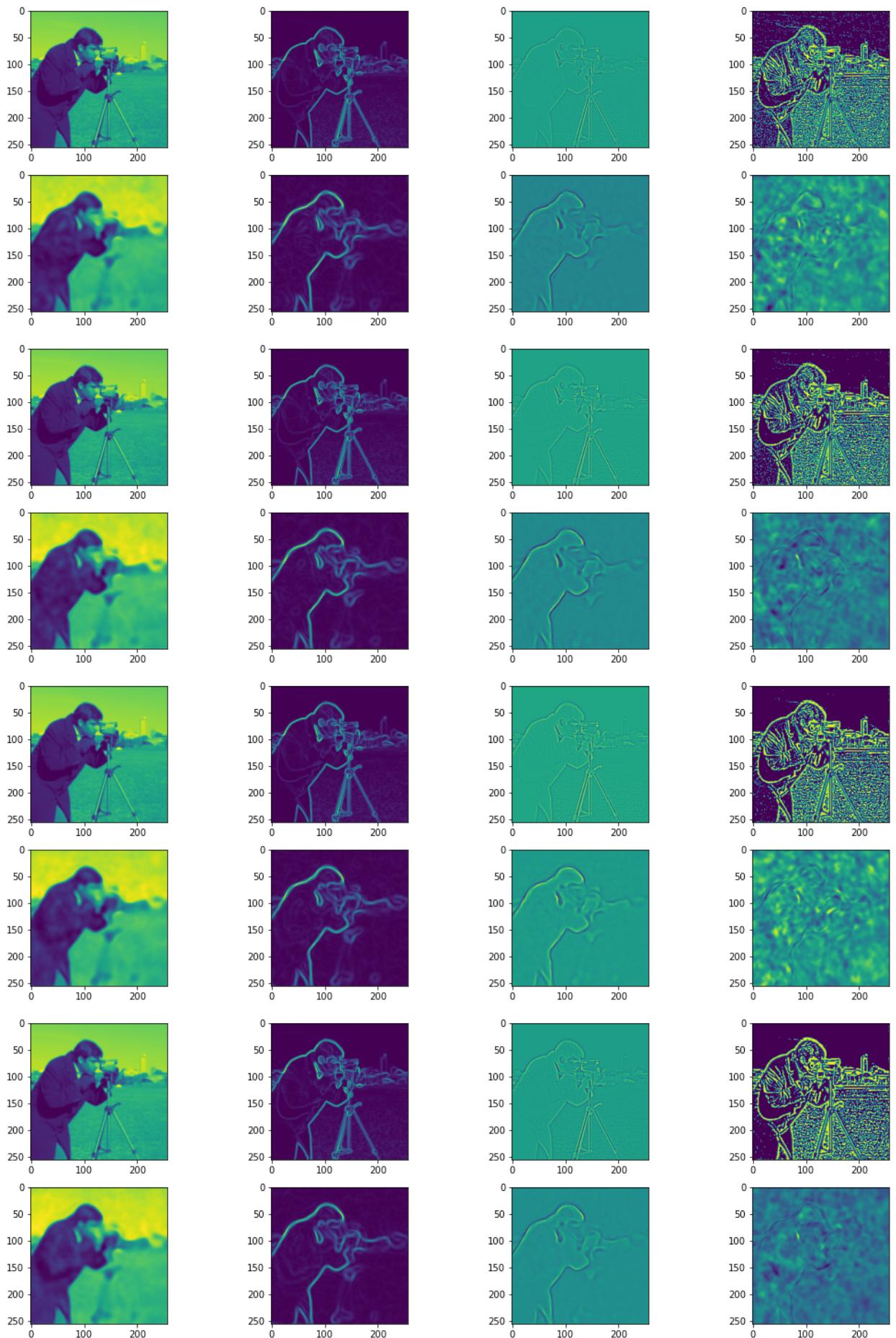
```

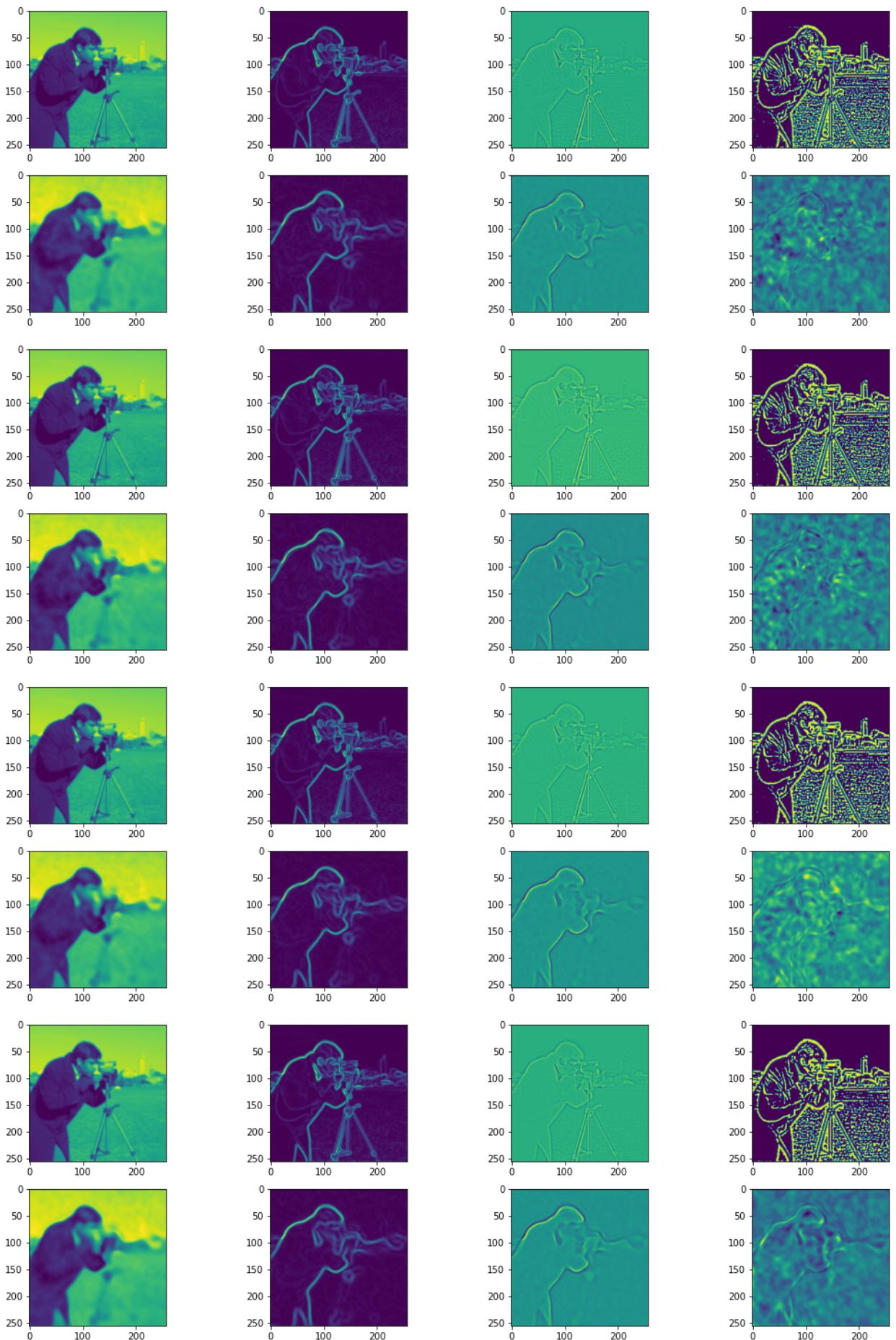
```

overhead: 1.236998%
[libx264 @ 0x55dbdbd3df00] frame I:1      Avg QP:18.08   size: 48485
[libx264 @ 0x55dbdbd3df00] frame P:38      Avg QP:19.08   size:  4112
[libx264 @ 0x55dbdbd3df00] frame B:111     Avg QP:14.71   size:     81
[libx264 @ 0x55dbdbd3df00] consecutive B-frames: 1.3% 0.0% 0.0% 98.7%
[libx264 @ 0x55dbdbd3df00] mb I  I16..4: 41.6% 33.7% 24.6%
[libx264 @ 0x55dbdbd3df00] mb P  I16..4:  0.4%  1.2%  0.4%  P16..4:  4.5%  1.
4% 1.3% 0.0% 0.0% skip:90.8%
[libx264 @ 0x55dbdbd3df00] mb B  I16..4:  0.1%  0.0%  0.0%  B16..8:  2.6%  0.
0% 0.0% direct: 0.0% skip:97.3% L0:43.9% L1:56.0% BI: 0.1%
[libx264 @ 0x55dbdbd3df00] 8x8 transform intra:42.6% inter:62.2%
[libx264 @ 0x55dbdbd3df00] coded y,uvDC,uvAC intra: 45.4% 48.6% 44.5% inter:
1.0% 1.4% 0.8%
[libx264 @ 0x55dbdbd3df00] i16 v,h,dc,p: 62% 26% 11% 1%
[libx264 @ 0x55dbdbd3df00] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 27% 11% 25% 4% 7%
7% 6% 6% 7%
[libx264 @ 0x55dbdbd3df00] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 29% 23% 18% 5% 6%
5% 5% 4% 5%
[libx264 @ 0x55dbdbd3df00] i8c dc,h,v,p: 59% 20% 16% 5%
[libx264 @ 0x55dbdbd3df00] Weighted P-Frames: Y:0.0% UV:0.0%
[libx264 @ 0x55dbdbd3df00] ref P L0: 72.8% 21.6% 5.1% 0.5%
[libx264 @ 0x55dbdbd3df00] ref B L0: 72.3% 27.4% 0.3%
[libx264 @ 0x55dbdbd3df00] ref B L1: 97.3% 2.7%
[libx264 @ 0x55dbdbd3df00] kb/s:341.92

```







```
In [36]: # SIREN, learn only with the observed jacobians (first derivative in space)
```

```

writer = SummaryWriter('runs/siren/cameraman_experiment_grads')

img_siren = Siren(in_features=3, out_features=1, hidden_features=512,
                  hidden_layers=3, outermost_linear=True)

train(img_siren, writer, img_path='original/cameraman.png', niter=1, total_epoch=100,
      beta_0=0, beta_1=1, beta_2=0, beta_3=0)

writer.close()

output_video(img_siren, img_path='original/cameraman.png', niter=10, vidName='vid.mp4')
-----Generating Data-----
100%|██████████| 1/1 [00:00<00:00, 613.02it/s]
-----Finished-----
-----Begin Training-----
lit [00:02, 2.48s/it]
Epoch 1, Epoch loss: total 14.697795, pixel 0.332216, grad 14.697795, laplacian 35.617714, dIdt 25870.363281
Epoch 1, Epoch SSIM: pixel 0.001655, grad 0.046982, laplacian 0.000119, dIdt 0.000000
lit [00:02, 2.85s/it]
Epoch 2, Epoch loss: total 13.711628, pixel 0.284649, grad 13.711628, laplacian 261.382538, dIdt 25853.847656
Epoch 2, Epoch SSIM: pixel 0.057005, grad 0.035269, laplacian 0.000022, dIdt 0.000000
lit [00:02, 2.86s/it]
Epoch 3, Epoch loss: total 13.247911, pixel 0.271771, grad 13.247911, laplacian 504.847565, dIdt 25853.062500
Epoch 3, Epoch SSIM: pixel 0.080277, grad 0.044334, laplacian 0.000013, dIdt 0.000000
lit [00:02, 2.88s/it]
Epoch 4, Epoch loss: total 12.973774, pixel 0.254532, grad 12.973774, laplacian 1077.434692, dIdt 25855.437500
Epoch 4, Epoch SSIM: pixel 0.129030, grad 0.052500, laplacian 0.000007, dIdt 0.000000
lit [00:02, 2.85s/it]
Epoch 5, Epoch loss: total 12.659532, pixel 0.239029, grad 12.659532, laplacian 1825.723999, dIdt 25854.148438
Epoch 5, Epoch SSIM: pixel 0.136009, grad 0.059442, laplacian 0.000024, dIdt 0.000000
lit [00:02, 2.87s/it]
Epoch 6, Epoch loss: total 12.362915, pixel 0.234775, grad 12.362915, laplacian 2372.271973, dIdt 25855.113281
Epoch 6, Epoch SSIM: pixel 0.174747, grad 0.068880, laplacian 0.000001, dIdt 0.000000
lit [00:02, 2.84s/it]
Epoch 7, Epoch loss: total 11.926476, pixel 0.230361, grad 11.926476, laplacian 3496.973877, dIdt 25856.580078
Epoch 7, Epoch SSIM: pixel 0.179794, grad 0.078503, laplacian 0.000009, dIdt 0.000000
lit [00:02, 2.86s/it]
Epoch 8, Epoch loss: total 11.791756, pixel 0.225046, grad 11.791756, laplacian 5439.836914, dIdt 25856.957031
Epoch 8, Epoch SSIM: pixel 0.172921, grad 0.085774, laplacian 0.000010, dIdt 0.000000
lit [00:02, 2.85s/it]

```

```

Epoch 9, Epoch loss: total 11.598133, pixel 0.221211, grad 11.598133, laplacian 6951.241211, dIdt 25856.873047
Epoch 9, Epoch SSIM: pixel 0.189502, grad 0.098909, laplacian 0.000028, dIdt 0.000000
lit [00:02, 2.86s/it]
Epoch 10, Epoch loss: total 11.121550, pixel 0.219830, grad 11.121550, laplacian 7941.830078, dIdt 25857.923828
Epoch 10, Epoch SSIM: pixel 0.200290, grad 0.103892, laplacian 0.000004, dIdt 0.000000
lit [00:02, 2.85s/it]
Epoch 11, Epoch loss: total 11.067993, pixel 0.218778, grad 11.067993, laplacian 10339.147461, dIdt 25858.408203
Epoch 11, Epoch SSIM: pixel 0.190056, grad 0.109031, laplacian 0.000007, dIdt 0.000000
0it [00:01, ?it/s]

-----
KeyboardInterrupt                                     Traceback (most recent call last)
/tmp/ipykernel_20545/2167697814.py in <module>
      6
      7 train(img_siren, writer, img_path='original/cameraman.png', niter=1, total_epochs=total_epochs, lr=[1e-4],
--> 8         beta_0=0, beta_1=1, beta_2=0, beta_3=0)
      9
     10 writer.close()

/tmp/ipykernel_20545/962146541.py in train(net, writer, img_path, niter, total_epochs, lr, beta_0, beta_1, beta_2, beta_3, cyclic, decay_exp, decay_multi)
      56             model_output, coords = net(model_input)
      57
--> 58             pixel_loss, grad_loss, laplacian_loss, dIdt_loss, pixel_ss
      59             im, grad_ssim, laplacian_ssim, dIdt_ssim = calcLoss(coords, model_output, gt)
      60             loss = beta_0 * pixel_loss + beta_1 * grad_loss + beta_2 * laplacian_loss + beta_3 * dIdt_loss

/tmp/ipykernel_20545/228745312.py in calcLoss(coords, model_output, gt)
      32             dIdt_loss = ((gradients[:, :, -1] - gt['dIdt'])**2).mean()
      33
--> 34             pixel_ssim = mean_ssim(gt['pixels'][0].cpu().view(1, 256, 256).detac
      35             h(), model_output[0].cpu().view(1, 256, 256).detach(), val_range=255)
      36             grad_ssim = mean_ssim(gt['grads'][0].norm(dim=-1).cpu().view(1, 256, 256).detac
      37             h(), gradients[0][:, :-1].norm(dim=-1).cpu().view(1, 256, 256).detac
      38             h(), val_range=255)

KeyboardInterrupt:

```

```

In [ ]: # SIREN, learns only with the observed laplacians (2nd derivative in space)
writer = SummaryWriter('runs/siren/cameraman_experiment_laplace')

img_siren = Siren(in_features=3, out_features=1, hidden_features=512,
                  hidden_layers=3, outermost_linear=True)

train(img_siren, writer, img_path='original/cameraman.png', niter=1, total_epochs=1,
      beta_0=0, beta_1=0, beta_2=1, beta_3=0)

writer.close()

output_video(img_siren, img_path='original/cameraman.png', niter=10, vidName='v'

```

```
In [ ]: # SIREN, learn only with the observed derivative in time (3rd derivative)
writer = SummaryWriter('runs/siren/cameraman_experiment_dIdt')

img_siren = Siren(in_features=3, out_features=1, hidden_features=512,
                  hidden_layers=3, outermost_linear=True)

train(img_siren, writer, img_path='original/cameraman.png', niter=1, total_epoch
      beta_0=0, beta_1=0, beta_2=0, beta_3=1)

writer.close()

output_video(img_siren, img_path='original/cameraman.png', niter=10, vidName='v
```

```
In [ ]: # SIREN, learn with all data, equally weighted
writer = SummaryWriter('runs/siren/cameraman_experiment_all')

img_siren = Siren(in_features=3, out_features=1, hidden_features=512,
                  hidden_layers=3, outermost_linear=True)

train(img_siren, writer, img_path='original/cameraman.png', niter=1, total_epoch
      beta_0=1, beta_1=1, beta_2=1, beta_3=1)

writer.close()

output_video(img_siren, img_path='original/cameraman.png', niter=10, vidName='v
```

Elu Baselines

```
In [ ]: # Base, learn only with the observed pixel values
writer = SummaryWriter('runs/base/cameraman_experiment_pixels')

img_base = Base(in_features=3, out_features=1, hidden_features=512,
                hidden_layers=3, outermost_linear=True)

train(img_base, writer, img_path='original/cameraman.png', niter=1, total_epoch
      beta_0=1, beta_1=0, beta_2=0, beta_3=0)

writer.close()
output_video(img_siren, img_path='original/cameraman.png', niter=10, vidName='v
```

```
In [ ]: # Base, learn only with the observed jacobians (first derivative in space)
writer = SummaryWriter('runs/base/cameraman_experiment_grads')

img_base = Base(in_features=3, out_features=1, hidden_features=512,
                hidden_layers=3, outermost_linear=True)

train(img_base, writer, img_path='original/cameraman.png', niter=1, total_epoch
      beta_0=0, beta_1=1, beta_2=0, beta_3=0)

writer.close()

output_video(img_siren, img_path='original/cameraman.png', niter=10, vidName='v
```

```
In [ ]: # Base, learn only with the observed laplacians (2nd derivative in space)
writer = SummaryWriter('runs/base/cameraman_experiment_laplace')
```

```
img_base = Base(in_features=3, out_features=1, hidden_features=512,
                 hidden_layers=3, outermost_linear=True)

train(img_base, writer, img_path='original/cameraman.png', niter=1, total_epochs=1000,
      beta_0=0, beta_1=0, beta_2=1, beta_3=0)

writer.close()
output_video(img_siren, img_path='original/cameraman.png', niter=10, vidName='vid1.mp4')
```

In []:

```
# Base, learn only with the observed derivative in time (3rd derivative)
writer = SummaryWriter('runs/base/cameraman_experiment_dIdt')

img_base = Base(in_features=3, out_features=1, hidden_features=512,
                 hidden_layers=3, outermost_linear=True)

train(img_base, writer, img_path='original/cameraman.png', niter=1, total_epochs=1000,
      beta_0=0, beta_1=0, beta_2=0, beta_3=1)

writer.close()

output_video(img_siren, img_path='original/cameraman.png', niter=10, vidName='vid2.mp4')
```

In []:

```
# Base, learn with all data, equally weighted
writer = SummaryWriter('runs/base/cameraman_experiment_all')

img_base = Base(in_features=3, out_features=1, hidden_features=512,
                 hidden_layers=3, outermost_linear=True)

train(img_base, writer, img_path='original/cameraman.png', niter=1, total_epochs=1000,
      beta_0=1, beta_1=1, beta_2=1, beta_3=1)

writer.close()

output_video(img_siren, img_path='original/cameraman.png', niter=10, vidName='vid3.mp4')
```

Experiments

Experiments Helper Functions

In [27]:

```
# @min_beta_sum: minimum sum of all four beta values
# @return: a list of 4 beta values, summing to at least min_beta_sum
def generate_random_beta_combos(min_beta_sum=0.1):
    possible_values = [1.0, 0.1, 0.01, 0.001, 0.0]
    betas = [0, 0, 0, 0]

    while np.sum(betas) <= min_beta_sum:
        betas = [random.choice(possible_values) for i in range(4)]

    return betas

# @betas: a list of beta values
# @return: a string with '_' between all beta values
def b_to_string(betas):
    return '_'.join(map(str, betas))
```

In [28]:

```
# runs one experiment with the elu activation function
def run_elu(model_path, betas, total_epochs, lr, cyclic=False, decay_exp=False,
```

```

writer = SummaryWriter(model_path)

img_base = Base(in_features=3, out_features=1, hidden_features=512,
                hidden_layers=3, outermost_linear=True)

train(img_base, writer, img_path='original/cameraman.png', niter=10,
      total_epochs=total_epochs, lr=lr,
      beta_0=betas[0], beta_1=betas[1], beta_2=betas[2], beta_3=betas[3],
      cyclic=cyclic, decay_exp=decay_exp, decay_multi=decay_multi)

writer.close()

output_video(img_base, img_path='original/cameraman.png', niter=10, vidName

```

In [29]:

```

# runs one experiment with the SIREN (periodic) activation function
def run_siren(model_path, betas, total_epochs, lr, cyclic=False, decay_exp=False):
    writer = SummaryWriter(model_path)

    img_siren = Siren(in_features=3, out_features=1, hidden_features=512,
                      hidden_layers=3, outermost_linear=True)

    train(img_siren, writer, img_path='original/cameraman.png', niter=10,
          total_epochs=total_epochs, lr=lr,
          beta_0=betas[0], beta_1=betas[1], beta_2=betas[2], beta_3=betas[3],
          cyclic=cyclic, decay_exp=decay_exp, decay_multi=decay_multi)

    writer.close()

    output_video(img_siren, img_path='original/cameraman.png', niter=10, vidName

```

Run the experiments

In [32]:

```

# settings
model_path = 'runs/cameraman/experiments'
total_epochs = 100
learning_rates = [1e-4, 1e-5, 1e-6, 1e-7]

# keep conducting experiments until we've reached the desired amount
num_experiments = 0
while num_experiments < 1: #100-47+1 as buffer

    torch.cuda.empty_cache()

    # get a random combination of betas
    #betas = generate_random_beta_combos()
    betas = [1.0, 1.0, 1.0, 1.0]
    model_path_b = model_path + "/" + b_to_string(betas)

    os.mkdir('/home/jupyter/videos/' + model_path_b)

    ### Part B. Models with SIREN (periodic) activation ###
    model_path_act = model_path_b + '/siren_'

    ## learning rate experiments ##

    # 1. run with uniform learning rates
    for uniform_lr in learning_rates:

```

```

model_path_full = model_path_act + 'uniformlr_' + "{:.0e}".format(uniform_lr)
run_siren(model_path_full, betas, total_epochs, [uniform_lr])

# 2. run with decaying learning rates
initial_lr = learning_rates[0]

# 2.2 exponential: decay_exp = True
model_path_full = model_path_act + '_decay_exp_' + "{:.0e}".format(initial_lr)
run_siren(model_path_full, betas, total_epochs, [initial_lr], decay_exp=True)

# 3. run with cyclic learning rate
max_lr = learning_rates[0]
min_lr = learning_rates[-1]
model_path_full = model_path_act + '_cyclic_' + "{:.0e}".format(max_lr) + '_'
run_siren(model_path_full, betas, total_epochs, [max_lr, min_lr], cyclic=True)

# 2.1 multi-step: decay_multi = True
model_path_full = model_path_act + '_decay_multi_' + "{:.0e}".format(initial_lr)
run_siren(model_path_full, betas, total_epochs, [initial_lr], decay_multi=True)

### Part A. Models with elu activation ###
model_path_act = model_path + '/elu_'

## learning rate experiments ##

# 1. run with uniform learning rates
for uniform_lr in learning_rates:
    model_path_full = model_path_act + 'uniformlr_' + "{:.0e}".format(uniform_lr)
    run_elu(model_path_full, betas, total_epochs, [uniform_lr])

# 2. run with decaying learning rates
initial_lr = learning_rates[0]

# 2.2 exponential: decay_exp = True
model_path_full = model_path_act + '_decay_exp_' + "{:.0e}".format(initial_lr)
run_elu(model_path_full, betas, total_epochs, [initial_lr], decay_exp=True)

# 3. run with cyclic learning rate
max_lr = learning_rates[0]
min_lr = learning_rates[-1]
model_path_full = model_path_act + '_cyclic_' + "{:.0e}".format(max_lr) + '_'
run_elu(model_path_full, betas, total_epochs, [max_lr, min_lr], cyclic=True)

# 2.1 multi-step: decay_multi = True
model_path_full = model_path_act + '_decay_multi_' + "{:.0e}".format(initial_lr)
run_elu(model_path_full, betas, total_epochs, [initial_lr], decay_multi=True)

# finished one more experiment
num_experiments += 1
print("finished experiment #", num_experiments)

```

```

/opt/conda/lib/python3.7/site-packages/torch/functional.py:568: UserWarning: t
orch.meshgrid: in an upcoming release, it will be required to pass the indexin
g argument. (Triggered internally at /opt/conda/conda-bld/pytorch_16467559535
18/work/aten/src/ATen/native/TensorShape.cpp:228.)
    return _VF.meshgrid(tensors, **kwargs) # type: ignore[attr-defined]
-----Generating Data-----

```

100% |██████████| 10/10 [00:00<00:00, 1034.33it/s]

```
-----Finished-----  
-----Begin Training-----  
10it [00:29,  2.99s/it]  
Epoch 1, Epoch loss: total 18051.040430, pixel 0.355565, grad 8.202123, laplacian 92.598656, dIdt 17949.884180  
Epoch 1, Epoch SSIM: pixel 0.051780, grad 0.030174, laplacian 0.000038, dIdt 0.001989  
10it [00:28,  2.87s/it]  
Epoch 2, Epoch loss: total 18681.576367, pixel 0.380786, grad 9.966455, laplacian 930.428348, dIdt 17740.800488  
Epoch 2, Epoch SSIM: pixel 0.017910, grad 0.017807, laplacian 0.000004, dIdt 0.000564  
10it [00:28,  2.86s/it]  
Epoch 3, Epoch loss: total 26802.184570, pixel 0.325467, grad 12.385083, laplacian 8793.226758, dIdt 17996.247168  
Epoch 3, Epoch SSIM: pixel 0.089457, grad 0.017362, laplacian 0.000005, dIdt 0.000770  
10it [00:28,  2.90s/it]  
Epoch 4, Epoch loss: total 97453.676953, pixel 0.325775, grad 20.714065, laplacian 79477.865039, dIdt 17954.771582  
Epoch 4, Epoch SSIM: pixel 0.073675, grad 0.015660, laplacian 0.000001, dIdt 0.000838  
10it [00:28,  2.86s/it]  
Epoch 5, Epoch loss: total 235804.033594, pixel 0.319848, grad 23.290424, laplacian 217823.851562, dIdt 17956.574902  
Epoch 5, Epoch SSIM: pixel 0.062833, grad 0.010935, laplacian 0.000003, dIdt 0.000141  
10it [00:28,  2.86s/it]  
Epoch 6, Epoch loss: total 177000.186719, pixel 0.321419, grad 18.004454, laplacian 159054.825000, dIdt 17927.032813  
Epoch 6, Epoch SSIM: pixel 0.084483, grad 0.012656, laplacian 0.000000, dIdt 0.000389  
10it [00:28,  2.87s/it]  
Epoch 7, Epoch loss: total 91114.070508, pixel 0.317687, grad 13.177844, laplacian 73202.752783, dIdt 17897.824414  
Epoch 7, Epoch SSIM: pixel 0.108591, grad 0.014167, laplacian 0.000001, dIdt 0.000584  
10it [00:28,  2.86s/it]  
Epoch 8, Epoch loss: total 80825.783008, pixel 0.322509, grad 14.112204, laplacian 62956.633789, dIdt 17854.716113  
Epoch 8, Epoch SSIM: pixel 0.146029, grad 0.010654, laplacian 0.000000, dIdt 0.000243  
10it [00:28,  2.87s/it]  
Epoch 9, Epoch loss: total 106656.002734, pixel 0.332316, grad 16.212092, laplacian 88821.291699, dIdt 17818.165527  
Epoch 9, Epoch SSIM: pixel 0.163318, grad 0.011720, laplacian 0.000000, dIdt 0.000162  
10it [00:32,  3.24s/it]  
Epoch 10, Epoch loss: total 142831.877344, pixel 0.342276, grad 20.327288, laplacian 124994.161328, dIdt 17817.045898  
Epoch 10, Epoch SSIM: pixel 0.175906, grad 0.008158, laplacian 0.000000, dIdt 0.000061  
10it [00:28,  2.89s/it]  
Epoch 11, Epoch loss: total 157406.065625, pixel 0.361046, grad 20.905729, laplacian 139542.335742, dIdt 17842.462500  
Epoch 11, Epoch SSIM: pixel 0.113263, grad 0.007384, laplacian 0.000000, dIdt 0.000012
```

```
10it [00:28, 2.88s/it]
Epoch 12, Epoch loss: total 129157.867969, pixel 0.359989, grad 22.709142, laplacian 111299.843750, dIdt 17834.956055
Epoch 12, Epoch SSIM: pixel 0.173715, grad 0.007062, laplacian 0.000001, dIdt 0.000066

10it [00:28, 2.89s/it]
Epoch 13, Epoch loss: total 98861.286719, pixel 0.357983, grad 19.478088, laplacian 80931.605273, dIdt 17909.847168
Epoch 13, Epoch SSIM: pixel 0.141066, grad 0.008772, laplacian 0.000000, dIdt 0.000050

10it [00:28, 2.87s/it]
Epoch 14, Epoch loss: total 136338.768750, pixel 0.345884, grad 22.693414, laplacian 118495.285156, dIdt 17820.446289
Epoch 14, Epoch SSIM: pixel 0.114158, grad 0.006760, laplacian 0.000000, dIdt -0.000023

10it [00:28, 2.90s/it]
Epoch 15, Epoch loss: total 125552.624219, pixel 0.387211, grad 24.385730, laplacian 107758.042188, dIdt 17769.806641
Epoch 15, Epoch SSIM: pixel 0.131997, grad 0.007130, laplacian -0.000000, dIdt -0.000035

10it [00:28, 2.89s/it]
Epoch 16, Epoch loss: total 154201.485937, pixel 0.399959, grad 26.759246, laplacian 136414.573828, dIdt 17759.754590
Epoch 16, Epoch SSIM: pixel 0.158427, grad 0.007462, laplacian 0.000000, dIdt -0.000054

10it [00:28, 2.87s/it]
Epoch 17, Epoch loss: total 146009.055469, pixel 0.433169, grad 26.103069, laplacian 128255.064453, dIdt 17727.455273
Epoch 17, Epoch SSIM: pixel 0.133272, grad 0.004288, laplacian 0.000000, dIdt -0.000062

10it [00:28, 2.87s/it]
Epoch 18, Epoch loss: total 128901.213672, pixel 0.456351, grad 26.795835, laplacian 111199.910547, dIdt 17674.051855
Epoch 18, Epoch SSIM: pixel 0.150674, grad 0.006705, laplacian 0.000000, dIdt 0.000021

10it [00:29, 2.91s/it]
Epoch 19, Epoch loss: total 151259.359375, pixel 0.494194, grad 33.044739, laplacian 133633.554688, dIdt 17592.263281
Epoch 19, Epoch SSIM: pixel 0.118678, grad 0.005950, laplacian 0.000000, dIdt 0.000013

10it [00:32, 3.22s/it]
Epoch 20, Epoch loss: total 198603.975781, pixel 0.569662, grad 38.619989, laplacian 180926.535938, dIdt 17638.248242
Epoch 20, Epoch SSIM: pixel 0.126894, grad 0.004878, laplacian -0.000000, dIdt -0.000054

10it [00:28, 2.88s/it]
Epoch 21, Epoch loss: total 241986.437500, pixel 0.528613, grad 41.922118, laplacian 224358.279688, dIdt 17585.707910
Epoch 21, Epoch SSIM: pixel 0.117720, grad 0.005689, laplacian 0.000000, dIdt -0.000115

10it [00:28, 2.89s/it]
Epoch 22, Epoch loss: total 282147.692969, pixel 0.735908, grad 50.588867, laplacian 264603.270313, dIdt 17493.100879
Epoch 22, Epoch SSIM: pixel 0.096395, grad 0.006595, laplacian 0.000000, dIdt 0.000018

10it [00:28, 2.88s/it]
```

```
Epoch 23, Epoch loss: total 257880.746875, pixel 0.744363, grad 55.332639, laplacian 240444.734375, dIdt 17379.936816
Epoch 23, Epoch SSIM: pixel 0.081391, grad 0.004674, laplacian 0.000000, dIdt 0.000137
10it [00:28, 2.87s/it]
Epoch 24, Epoch loss: total 323587.660938, pixel 0.824708, grad 64.502404, laplacian 306284.635937, dIdt 17237.697656
Epoch 24, Epoch SSIM: pixel 0.089469, grad 0.004910, laplacian 0.000000, dIdt 0.000231
10it [00:28, 2.88s/it]
Epoch 25, Epoch loss: total 413210.059375, pixel 0.906186, grad 83.825429, laplacian 395850.215625, dIdt 17275.110938
Epoch 25, Epoch SSIM: pixel 0.070187, grad 0.003826, laplacian 0.000000, dIdt 0.000187
10it [00:28, 2.86s/it]
Epoch 26, Epoch loss: total 461773.721875, pixel 1.011696, grad 92.037510, laplacian 444676.115625, dIdt 17004.552539
Epoch 26, Epoch SSIM: pixel 0.071741, grad 0.003162, laplacian 0.000000, dIdt 0.000334
10it [00:28, 2.87s/it]
Epoch 27, Epoch loss: total 532709.784375, pixel 1.085433, grad 119.464005, laplacian 515862.068750, dIdt 16727.172656
Epoch 27, Epoch SSIM: pixel 0.059100, grad 0.003307, laplacian 0.000000, dIdt 0.000365
10it [00:28, 2.88s/it]
Epoch 28, Epoch loss: total 603055.481250, pixel 1.154689, grad 155.141214, laplacian 586434.925000, dIdt 16464.252539
Epoch 28, Epoch SSIM: pixel 0.054407, grad 0.001776, laplacian -0.000000, dIdt 0.000737
10it [00:28, 2.88s/it]
Epoch 29, Epoch loss: total 790742.731250, pixel 1.513791, grad 200.450307, laplacian 774307.787500, dIdt 16232.984570
Epoch 29, Epoch SSIM: pixel 0.045625, grad 0.001980, laplacian 0.000000, dIdt 0.001247
10it [00:32, 3.22s/it]
Epoch 30, Epoch loss: total 981890.087500, pixel 1.548286, grad 273.455344, laplacian 965991.768750, dIdt 15623.304980
Epoch 30, Epoch SSIM: pixel 0.036807, grad 0.001540, laplacian 0.000000, dIdt 0.002010
10it [00:28, 2.88s/it]
Epoch 31, Epoch loss: total 1129087.550000, pixel 1.877158, grad 328.536111, laplacian 1113384.318750, dIdt 15372.814941
Epoch 31, Epoch SSIM: pixel 0.030697, grad 0.000579, laplacian 0.000000, dIdt 0.002514
10it [00:28, 2.89s/it]
Epoch 32, Epoch loss: total 1321216.375000, pixel 2.106646, grad 403.605945, laplacian 1306123.850000, dIdt 14686.813672
Epoch 32, Epoch SSIM: pixel 0.026495, grad -0.000104, laplacian 0.000000, dIdt 0.003954
10it [00:28, 2.89s/it]
Epoch 33, Epoch loss: total 1401860.731250, pixel 2.068439, grad 435.656659, laplacian 1387485.962500, dIdt 13937.048145
Epoch 33, Epoch SSIM: pixel 0.027211, grad 0.000543, laplacian -0.000000, dIdt 0.005908
10it [00:28, 2.87s/it]
```

```
Epoch 34, Epoch loss: total 1599735.318750, pixel 2.701831, grad 489.988940, l  
aplacian 1585725.012500, dIdt 13517.642285  
Epoch 34, Epoch SSIM: pixel 0.025736, grad 0.000320, laplacian 0.000000, dIdt  
0.008157  
10it [00:28, 2.89s/it]  
Epoch 35, Epoch loss: total 1738056.325000, pixel 2.320626, grad 512.027859, l  
aplacian 1724058.850000, dIdt 13483.120898  
Epoch 35, Epoch SSIM: pixel 0.018641, grad 0.000768, laplacian 0.000000, dIdt  
0.008441  
10it [00:28, 2.88s/it]  
Epoch 36, Epoch loss: total 1626104.125000, pixel 2.951795, grad 479.471445, l  
aplacian 1613189.400000, dIdt 12432.333203  
Epoch 36, Epoch SSIM: pixel 0.021820, grad 0.000781, laplacian 0.000000, dIdt  
0.011574  
10it [00:28, 2.87s/it]  
Epoch 37, Epoch loss: total 1711824.900000, pixel 2.397630, grad 513.098428, l  
aplacian 1699085.212500, dIdt 12224.205273  
Epoch 37, Epoch SSIM: pixel 0.022569, grad 0.001309, laplacian 0.000000, dIdt  
0.014535  
10it [00:28, 2.89s/it]  
Epoch 38, Epoch loss: total 1478389.618750, pixel 2.883803, grad 408.824564, l  
aplacian 1466627.806250, dIdt 11350.116797  
Epoch 38, Epoch SSIM: pixel 0.016861, grad 0.001766, laplacian 0.000000, dIdt  
0.017096  
10it [00:28, 2.87s/it]  
Epoch 39, Epoch loss: total 1443183.212500, pixel 2.112881, grad 411.928003, l  
aplacian 1431841.262500, dIdt 10927.904297  
Epoch 39, Epoch SSIM: pixel 0.025249, grad 0.001313, laplacian 0.000000, dIdt  
0.021561  
10it [00:32, 3.21s/it]  
Epoch 40, Epoch loss: total 1141873.475000, pixel 2.096737, grad 286.433771, l  
aplacian 1131028.193750, dIdt 10556.747363  
Epoch 40, Epoch SSIM: pixel 0.021781, grad 0.002592, laplacian -0.000000, dIdt  
0.025659  
10it [00:28, 2.89s/it]  
Epoch 41, Epoch loss: total 1068368.793750, pixel 1.924931, grad 271.100066, l  
aplacian 1057718.100000, dIdt 10377.683887  
Epoch 41, Epoch SSIM: pixel 0.025274, grad 0.001580, laplacian 0.000000, dIdt  
0.034221  
10it [00:28, 2.87s/it]  
Epoch 42, Epoch loss: total 867644.256250, pixel 1.602989, grad 201.641953, la  
placian 856994.225000, dIdt 10446.787402  
Epoch 42, Epoch SSIM: pixel 0.033226, grad 0.002359, laplacian 0.000000, dIdt  
0.033536  
10it [00:28, 2.87s/it]  
Epoch 43, Epoch loss: total 953318.481250, pixel 1.809657, grad 212.754318, la  
placian 943414.231250, dIdt 9689.688281  
Epoch 43, Epoch SSIM: pixel 0.030735, grad 0.003778, laplacian 0.000000, dIdt  
0.043852  
10it [00:28, 2.87s/it]  
Epoch 44, Epoch loss: total 814068.187500, pixel 1.548801, grad 166.868473, la  
placian 804035.831250, dIdt 9863.953027  
Epoch 44, Epoch SSIM: pixel 0.032809, grad 0.005300, laplacian 0.000000, dIdt  
0.046165  
10it [00:28, 2.87s/it]
```

```
Epoch 45, Epoch loss: total 825115.762500, pixel 1.364979, grad 172.153327, la  
placian 815291.512500, dIdt 9650.742871  
Epoch 45, Epoch SSIM: pixel 0.037564, grad 0.003680, laplacian 0.000000, dIdt  
0.050957  
10it [00:28, 2.87s/it]  
Epoch 46, Epoch loss: total 867185.993750, pixel 1.691997, grad 170.976453, la  
placian 857213.275000, dIdt 9800.046289  
Epoch 46, Epoch SSIM: pixel 0.034205, grad 0.006140, laplacian -0.000000, dIdt  
0.052614  
10it [00:28, 2.90s/it]  
Epoch 47, Epoch loss: total 849514.262500, pixel 1.320409, grad 162.925014, la  
placian 839819.412500, dIdt 9530.588965  
Epoch 47, Epoch SSIM: pixel 0.044274, grad 0.006142, laplacian 0.000000, dIdt  
0.056465  
10it [00:28, 2.86s/it]  
Epoch 48, Epoch loss: total 878828.150000, pixel 1.467412, grad 166.084959, la  
placian 869477.200000, dIdt 9183.400146  
Epoch 48, Epoch SSIM: pixel 0.031044, grad 0.007954, laplacian 0.000000, dIdt  
0.065846  
10it [00:28, 2.87s/it]  
Epoch 49, Epoch loss: total 800673.587500, pixel 1.297565, grad 136.841653, la  
placian 791432.837500, dIdt 9102.621777  
Epoch 49, Epoch SSIM: pixel 0.038453, grad 0.006532, laplacian -0.000000, dIdt  
0.070119  
10it [00:32, 3.21s/it]  
Epoch 50, Epoch loss: total 832570.337500, pixel 1.264418, grad 127.803999, la  
placian 823450.743750, dIdt 8990.519092  
Epoch 50, Epoch SSIM: pixel 0.040091, grad 0.010266, laplacian 0.000000, dIdt  
0.075571  
10it [00:28, 2.87s/it]  
Epoch 51, Epoch loss: total 892686.756250, pixel 1.151230, grad 149.179009, la  
placian 883513.450000, dIdt 9022.981104  
Epoch 51, Epoch SSIM: pixel 0.039597, grad 0.008985, laplacian 0.000000, dIdt  
0.076614  
10it [00:28, 2.88s/it]  
Epoch 52, Epoch loss: total 890516.193750, pixel 1.243004, grad 127.601778, la  
placian 881367.093750, dIdt 9020.257568  
Epoch 52, Epoch SSIM: pixel 0.037606, grad 0.010993, laplacian 0.000000, dIdt  
0.081105  
10it [00:28, 2.87s/it]  
Epoch 53, Epoch loss: total 1027831.837500, pixel 1.120084, grad 171.988436, la  
placian 1018667.568750, dIdt 8991.164795  
Epoch 53, Epoch SSIM: pixel 0.035571, grad 0.007279, laplacian 0.000000, dIdt  
0.083799  
10it [00:28, 2.88s/it]  
Epoch 54, Epoch loss: total 1098999.743750, pixel 1.326885, grad 151.563647, la  
placian 1089838.925000, dIdt 9007.899414  
Epoch 54, Epoch SSIM: pixel 0.037010, grad 0.014217, laplacian 0.000000, dIdt  
0.082988  
10it [00:28, 2.86s/it]  
Epoch 55, Epoch loss: total 1326132.631250, pixel 1.083204, grad 236.571284, la  
placian 1316737.437500, dIdt 9157.547559  
Epoch 55, Epoch SSIM: pixel 0.033379, grad 0.006436, laplacian 0.000000, dIdt  
0.078757  
10it [00:28, 2.88s/it]
```

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Epoch 56, Epoch loss: total 1473683.456250, pixel 1.612975, grad 215.409652, 1  
aplacian 1464049.450000, dIdt 9416.959473  
Epoch 56, Epoch SSIM: pixel 0.030171, grad 0.011877, laplacian 0.000000, dIdt  
0.072717  
10it [00:28, 2.87s/it]  
Epoch 57, Epoch loss: total 1667850.806250, pixel 1.241476, grad 313.015442, 1  
aplacian 1657730.212500, dIdt 9806.339551  
Epoch 57, Epoch SSIM: pixel 0.026099, grad 0.004659, laplacian 0.000000, dIdt  
0.064051  
10it [00:28, 2.88s/it]  
Epoch 58, Epoch loss: total 1746937.756250, pixel 1.682479, grad 274.740873, 1  
aplacian 1736875.568750, dIdt 9785.794043  
Epoch 58, Epoch SSIM: pixel 0.030682, grad 0.008644, laplacian 0.000000, dIdt  
0.061402  
10it [00:28, 2.88s/it]  
Epoch 59, Epoch loss: total 1786214.337500, pixel 1.617009, grad 340.446294, 1  
aplacian 1775877.550000, dIdt 9994.765332  
Epoch 59, Epoch SSIM: pixel 0.024212, grad 0.004401, laplacian 0.000000, dIdt  
0.059115  
10it [00:32, 3.26s/it]  
Epoch 60, Epoch loss: total 1705472.675000, pixel 1.587999, grad 278.214854, 1  
aplacian 1695470.987500, dIdt 9721.872070  
Epoch 60, Epoch SSIM: pixel 0.029732, grad 0.006317, laplacian 0.000000, dIdt  
0.063436  
10it [00:28, 2.88s/it]  
Epoch 61, Epoch loss: total 1598502.250000, pixel 1.494052, grad 281.854950, 1  
aplacian 1588887.837500, dIdt 9331.050879  
Epoch 61, Epoch SSIM: pixel 0.031675, grad 0.003262, laplacian 0.000000, dIdt  
0.071294  
10it [00:28, 2.88s/it]  
Epoch 62, Epoch loss: total 1420087.000000, pixel 1.282137, grad 211.583838, 1  
aplacian 1410718.137500, dIdt 9155.977393  
Epoch 62, Epoch SSIM: pixel 0.033691, grad 0.006978, laplacian 0.000000, dIdt  
0.079032  
10it [00:28, 2.90s/it]  
Epoch 63, Epoch loss: total 1334786.981250, pixel 1.155571, grad 185.324464, 1  
aplacian 1325656.575000, dIdt 8943.922070  
Epoch 63, Epoch SSIM: pixel 0.038548, grad 0.007252, laplacian 0.000000, dIdt  
0.088886  
10it [00:28, 2.88s/it]  
Epoch 64, Epoch loss: total 1369692.618750, pixel 1.177048, grad 179.723962, 1  
aplacian 1360562.837500, dIdt 8948.855957  
Epoch 64, Epoch SSIM: pixel 0.032667, grad 0.008371, laplacian -0.000000, dIdt  
0.095332  
10it [00:28, 2.87s/it]  
Epoch 65, Epoch loss: total 1301486.987500, pixel 1.010258, grad 156.040433, 1  
aplacian 1292375.737500, dIdt 8954.197168  
Epoch 65, Epoch SSIM: pixel 0.041542, grad 0.008499, laplacian -0.000000, dIdt  
0.097706  
10it [00:28, 2.90s/it]  
Epoch 66, Epoch loss: total 1468748.475000, pixel 1.068365, grad 175.705763, 1  
aplacian 1459826.700000, dIdt 8745.008984  
Epoch 66, Epoch SSIM: pixel 0.041183, grad 0.008818, laplacian 0.000000, dIdt  
0.111990  
10it [00:28, 2.87s/it]
```

```
Epoch 67, Epoch loss: total 1493959.575000, pixel 0.936973, grad 162.879820, 1  
aplacian 1484786.762500, dIdt 9009.019385  
Epoch 67, Epoch SSIM: pixel 0.041671, grad 0.010782, laplacian 0.000000, dIdt  
0.106932  
10it [00:28, 2.86s/it]  
Epoch 68, Epoch loss: total 1852915.862500, pixel 0.950293, grad 223.292650, 1  
aplacian 1843672.875000, dIdt 9018.782520  
Epoch 68, Epoch SSIM: pixel 0.041032, grad 0.004551, laplacian 0.000000, dIdt  
0.104143  
10it [00:28, 2.87s/it]  
Epoch 69, Epoch loss: total 1999430.075000, pixel 1.129547, grad 238.344032, 1  
aplacian 1989780.125000, dIdt 9410.484180  
Epoch 69, Epoch SSIM: pixel 0.035110, grad 0.006877, laplacian 0.000000, dIdt  
0.101291  
10it [00:32, 3.22s/it]  
Epoch 70, Epoch loss: total 2390907.437500, pixel 1.043160, grad 301.450005, 1  
aplacian 2381592.537500, dIdt 9012.381787  
Epoch 70, Epoch SSIM: pixel 0.039797, grad 0.006593, laplacian 0.000000, dIdt  
0.100185  
10it [00:28, 2.87s/it]  
Epoch 71, Epoch loss: total 2162388.175000, pixel 1.086308, grad 257.675293, 1  
aplacian 2153359.087500, dIdt 8770.327393  
Epoch 71, Epoch SSIM: pixel 0.041576, grad 0.005943, laplacian 0.000000, dIdt  
0.109845  
10it [00:28, 2.87s/it]  
Epoch 72, Epoch loss: total 2066755.500000, pixel 0.924294, grad 242.052110, 1  
aplacian 2057882.012500, dIdt 8630.500195  
Epoch 72, Epoch SSIM: pixel 0.047635, grad 0.006068, laplacian 0.000000, dIdt  
0.115335  
10it [00:28, 2.87s/it]  
Epoch 73, Epoch loss: total 2284484.512500, pixel 1.043720, grad 237.196713, 1  
aplacian 2275630.200000, dIdt 8616.108398  
Epoch 73, Epoch SSIM: pixel 0.038070, grad 0.009065, laplacian 0.000000, dIdt  
0.115079  
10it [00:28, 2.87s/it]  
Epoch 74, Epoch loss: total 2533517.937500, pixel 0.880737, grad 312.864613, 1  
aplacian 2524290.487500, dIdt 8913.725684  
Epoch 74, Epoch SSIM: pixel 0.044214, grad 0.006335, laplacian 0.000000, dIdt  
0.104020  
10it [00:28, 2.89s/it]  
Epoch 75, Epoch loss: total 2931133.350000, pixel 1.327472, grad 310.595018, 1  
aplacian 2921696.950000, dIdt 9124.483789  
Epoch 75, Epoch SSIM: pixel 0.037113, grad 0.011103, laplacian 0.000000, dIdt  
0.096192  
10it [00:28, 2.88s/it]  
Epoch 76, Epoch loss: total 3369255.487500, pixel 1.213796, grad 452.494438, 1  
aplacian 3359320.675000, dIdt 9481.062305  
Epoch 76, Epoch SSIM: pixel 0.028801, grad 0.004676, laplacian 0.000000, dIdt  
0.077278  
10it [00:28, 2.87s/it]  
Epoch 77, Epoch loss: total 3348040.237500, pixel 1.727302, grad 401.881876, 1  
aplacian 3337781.062500, dIdt 9855.609033  
Epoch 77, Epoch SSIM: pixel 0.026295, grad 0.008877, laplacian 0.000000, dIdt  
0.071062  
10it [00:28, 2.89s/it]
```

```
Epoch 78, Epoch loss: total 3100536.000000, pixel 1.668897, grad 452.956163, l  
aplacian 3090046.000000, dIdt 10035.389746  
Epoch 78, Epoch SSIM: pixel 0.027605, grad 0.003537, laplacian 0.000000, dIdt  
0.070612  
10it [00:28, 2.87s/it]  
Epoch 79, Epoch loss: total 2713184.050000, pixel 1.432368, grad 353.388600, l  
aplacian 2703381.350000, dIdt 9447.857715  
Epoch 79, Epoch SSIM: pixel 0.028068, grad 0.008116, laplacian 0.000000, dIdt  
0.082531  
10it [00:32, 3.22s/it]  
Epoch 80, Epoch loss: total 2349003.400000, pixel 1.122772, grad 307.000716, l  
aplacian 2339760.950000, dIdt 8934.295020  
Epoch 80, Epoch SSIM: pixel 0.039641, grad 0.003880, laplacian 0.000000, dIdt  
0.099267  
-----Finished-----  
-----Generating Data-----  
100%|██████████| 10/10 [00:00<00:00, 1235.25it/s]  
-----Finished-----
```

```

10it [00:18,  1.90s/it]
ffmpeg version 4.1.9-0+deb10u1 Copyright (c) 2000-2022 the FFmpeg developers
  built with gcc 8 (Debian 8.3.0-6)
  configuration: --prefix=/usr --extra-version=0+deb10u1 --toolchain=hardened
  --libdir=/usr/lib/x86_64-linux-gnu --incdir=/usr/include/x86_64-linux-gnu --arch=amd64 --enable-gpl --disable-stripping --enable-avresample --disable-filter=resample --enable-avisynth --enable-gnutls --enable-ladspa --enable-libaom --enable-libass --enable-libbluray --enable-libbs2b --enable-libcaca --enable-libcdio --enable-libcodec2 --enable-libflite --enable-libfontconfig --enable-libfreetype --enable-libfribidi --enable-libgme --enable-libgsm --enable-libjack --enable-libmp3lame --enable-libmysofa --enable-libopenjpeg --enable-libopenmp3 --enable-libopus --enable-libpulse --enable-librsvg --enable-librubberband --enable-libshine --enable-libsنappy --enable-libsoxr --enable-libspeex --enable-libssh --enable-libtheora --enable-libtwolame --enable-libvidstab --enable-libvorbis --enable-libvpx --enable-libwavpack --enable-libwebp --enable-libx265 --enable-libxml2 --enable-libxvid --enable-libzmq --enable-libzvbi --enable-lv2 --enable-omx --enable-openal --enable-opengl --enable-sdl2 --enable-libdc1394 --enable-libdrm --enable-libiec61883 --enable-chromaprint --enable-frei0r --enable-libx264 --enable-shared
  libavutil      56. 22.100 / 56. 22.100
  libavcodec     58. 35.100 / 58. 35.100
  libavformat    58. 20.100 / 58. 20.100
  libavdevice     58.  5.100 / 58.  5.100
  libavfilter     7. 40.101 /  7. 40.101
  libavresample   4.  0.  0 /  4.  0.  0
  libswscale      5.  3.100 /  5.  3.100
  libswresample   3.  3.100 /  3.  3.100
  libpostproc    55.  3.100 / 55.  3.100
Input #0, image2, from 'tmp/file%02d.png':
  Duration: 00:00:05.00, start: 0.000000, bitrate: N/A
    Stream #0:0: Video: png, rgba(pc), 1296x432 [SAR 2835:2835 DAR 3:1], 2 fps, 2 tbr, 2 tbn, 2 tbc
    Stream mapping:
      Stream #0:0 -> #0:0 (png (native) -> h264 (libx264))
Press [q] to stop, [?] for help
[libx264 @ 0x558806373f00] using SAR=1/1
[libx264 @ 0x558806373f00] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2 AVX FMA3 BMI2 AVX2
[libx264 @ 0x558806373f00] profile High, level 3.1
[libx264 @ 0x558806373f00] 264 - core 155 r2917 0a84d98 - H.264/MPEG-4 AVC codec - Copyleft 2003-2018 - http://www.videolan.org/x264.html - options: cabac=1 ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00:0.00 mixed_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast_pskip=1 chroma_qp_offset=-2 threads=3 lookahead_threads=1 sliced_threads=0 nr=0 decimate=1 interlaced=0 bluray_compat=0 constrained_intra=0 bframes=3 b_pyr amid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 keyint_min=25 scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=2.3.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ratio=1.40 aq=1:1.00
Output #0, mp4, to '/home/jupyter/videos/runs/cameraman/experiments/1.0_1.0_1.0_1.0/siren_uniformlr_1e-04_video.mp4':
  Metadata:
    encoder : Lavf58.20.100
  Stream #0:0: Video: h264 (libx264) (avc1 / 0x31637661), yuv420p, 1296x432 [SAR 1:1 DAR 3:1], q=-1--1, 30 fps, 15360 tbn, 30 tbc
  Metadata:
    encoder : Lavc58.35.100 libx264
  Side data:
    cpb: bitrate max/min/avg: 0/0/0 buffer size: 0 vbv_delay: -1
    frame= 150 fps= 91 q=-1.0 Lsize=      328kB time=00:00:04.90 bitrate= 549.1kbit/s dup=140 drop=0 speed=2.96x

```

```
video:326kB audio:0kB subtitle:0kB other streams:0kB global headers:0kB muxing overhead: 0.794854%
[libx264 @ 0x558806373f00] frame I:1      Avg QP:15.71  size: 60145
[libx264 @ 0x558806373f00] frame P:38     Avg QP:19.29  size: 6932
[libx264 @ 0x558806373f00] frame B:111    Avg QP:14.83  size:     85
[libx264 @ 0x558806373f00] consecutive B-frames: 1.3% 0.0% 0.0% 98.7%
[libx264 @ 0x558806373f00] mb I  I16..4: 58.5% 16.9% 24.6%
[libx264 @ 0x558806373f00] mb P  I16..4:  0.4%  2.1%  0.7%  P16..4:  3.9%  1.
1% 1.1% 0.0% 0.0%  skip:90.6%
[libx264 @ 0x558806373f00] mb B  I16..4:  0.1%  0.0%  0.0%  B16..8:  2.9%  0.
0% 0.0% direct: 0.0% skip:97.0% L0:48.2% L1:51.7% BI: 0.1%
[libx264 @ 0x558806373f00] 8x8 transform intra:41.2% inter:59.9%
[libx264 @ 0x558806373f00] coded y,uvDC,uvAC intra: 58.4% 60.3% 57.8% inter:
0.9% 1.2% 0.7%
[libx264 @ 0x558806373f00] i16 v,h,dc,p: 71% 22% 7% 1%
[libx264 @ 0x558806373f00] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 11% 11% 23% 8% 9%
9% 9% 11%
[libx264 @ 0x558806373f00] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 23% 21% 17% 6% 7%
6% 7% 6% 7%
[libx264 @ 0x558806373f00] i8c dc,h,v,p: 61% 17% 14% 9%
[libx264 @ 0x558806373f00] Weighted P-Frames: Y:0.0% UV:0.0%
[libx264 @ 0x558806373f00] ref P L0: 71.2% 21.6% 6.5% 0.7%
[libx264 @ 0x558806373f00] ref B L0: 68.9% 30.6% 0.5%
[libx264 @ 0x558806373f00] ref B L1: 97.6% 2.4%
[libx264 @ 0x558806373f00] kb/s:532.73
```

-----Generating Data-----

100%|██████████| 10/10 [00:00<00:00, 1108.28it/s]

-----Finished-----

-----Begin Training-----

10it [00:28, 2.83s/it]

Epoch 1, Epoch loss: total 17986.245801, pixel 0.320238, grad 7.924849, laplacian 41.869576, dIdt 17936.131055

Epoch 1, Epoch SSIM: pixel -0.036668, grad 0.040139, laplacian 0.000057, dIdt 0.004788

10it [00:28, 2.87s/it]

Epoch 2, Epoch loss: total 17962.376172, pixel 0.318450, grad 7.911846, laplacian 44.427595, dIdt 17909.718359

Epoch 2, Epoch SSIM: pixel -0.020983, grad 0.038125, laplacian 0.000061, dIdt 0.004519

10it [00:28, 2.89s/it]

Epoch 3, Epoch loss: total 17957.233496, pixel 0.318033, grad 7.928342, laplacian 54.004008, dIdt 17894.983496

Epoch 3, Epoch SSIM: pixel -0.003548, grad 0.034038, laplacian 0.000041, dIdt 0.003493

10it [00:28, 2.87s/it]

Epoch 4, Epoch loss: total 17958.469336, pixel 0.318740, grad 7.978160, laplacian 72.319814, dIdt 17877.852637

Epoch 4, Epoch SSIM: pixel 0.022747, grad 0.029330, laplacian 0.000024, dIdt 0.002457

10it [00:28, 2.87s/it]

Epoch 5, Epoch loss: total 17968.564844, pixel 0.322187, grad 8.085252, laplacian 104.952074, dIdt 17855.205762

Epoch 5, Epoch SSIM: pixel 0.054910, grad 0.024408, laplacian 0.000020, dIdt 0.001750

10it [00:28, 2.87s/it]

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Epoch 6, Epoch loss: total 17995.156445, pixel 0.332618, grad 8.298593, laplacian 162.063870, dIdt 17824.461523
Epoch 6, Epoch SSIM: pixel 0.086119, grad 0.019954, laplacian 0.000012, dIdt 0.001021
10it [00:28, 2.87s/it]
Epoch 7, Epoch loss: total 18050.006348, pixel 0.358572, grad 8.686528, laplacian 256.449150, dIdt 17784.512109
Epoch 7, Epoch SSIM: pixel 0.110891, grad 0.016387, laplacian 0.000012, dIdt 0.000539
10it [00:28, 2.87s/it]
Epoch 8, Epoch loss: total 18141.140234, pixel 0.411468, grad 9.285938, laplacian 393.368124, dIdt 17738.074805
Epoch 8, Epoch SSIM: pixel 0.126613, grad 0.014057, laplacian 0.000008, dIdt 0.000291
10it [00:28, 2.88s/it]
Epoch 9, Epoch loss: total 18261.213379, pixel 0.495936, grad 10.038999, laplacian 560.407321, dIdt 17690.271094
Epoch 9, Epoch SSIM: pixel 0.132596, grad 0.012953, laplacian 0.000003, dIdt 0.000194
10it [00:31, 3.20s/it]
Epoch 10, Epoch loss: total 18387.180957, pixel 0.602737, grad 10.810179, laplacian 732.110400, dIdt 17643.657715
Epoch 10, Epoch SSIM: pixel 0.129664, grad 0.012798, laplacian 0.000007, dIdt 0.000131
10it [00:28, 2.87s/it]
Epoch 11, Epoch loss: total 18495.209375, pixel 0.717669, grad 11.473377, laplacian 883.967969, dIdt 17599.050293
Epoch 11, Epoch SSIM: pixel 0.122435, grad 0.012928, laplacian 0.000005, dIdt 0.000112
10it [00:28, 2.87s/it]
Epoch 12, Epoch loss: total 18576.952246, pixel 0.831437, grad 11.991097, laplacian 1006.991260, dIdt 17557.138574
Epoch 12, Epoch SSIM: pixel 0.114760, grad 0.013076, laplacian 0.000007, dIdt 0.000099
10it [00:28, 2.89s/it]
Epoch 13, Epoch loss: total 18638.978418, pixel 0.940613, grad 12.399021, laplacian 1107.646271, dIdt 17517.992773
Epoch 13, Epoch SSIM: pixel 0.108107, grad 0.012930, laplacian 0.000005, dIdt 0.000108
10it [00:28, 2.88s/it]
Epoch 14, Epoch loss: total 18690.949902, pixel 1.045593, grad 12.743267, laplacian 1195.900568, dIdt 17481.260254
Epoch 14, Epoch SSIM: pixel 0.102771, grad 0.012809, laplacian 0.000006, dIdt 0.000113
10it [00:28, 2.88s/it]
Epoch 15, Epoch loss: total 18738.307812, pixel 1.148458, grad 13.051287, laplacian 1277.759943, dIdt 17446.348047
Epoch 15, Epoch SSIM: pixel 0.098489, grad 0.012698, laplacian 0.000005, dIdt 0.000111
10it [00:28, 2.90s/it]
Epoch 16, Epoch loss: total 18782.637988, pixel 1.250445, grad 13.332477, laplacian 1355.352094, dIdt 17412.703027
Epoch 16, Epoch SSIM: pixel 0.094824, grad 0.012645, laplacian 0.000007, dIdt 0.000128
10it [00:28, 2.87s/it]
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Epoch 17, Epoch loss: total 18824.921777, pixel 1.352077, grad 13.594682, laplacian 1430.130377, dIdt 17379.844727
Epoch 17, Epoch SSIM: pixel 0.091448, grad 0.012393, laplacian 0.000004, dIdt 0.000143
10it [00:28, 2.87s/it]
Epoch 18, Epoch loss: total 18866.080762, pixel 1.454095, grad 13.846084, laplacian 1503.324823, dIdt 17347.455273
Epoch 18, Epoch SSIM: pixel 0.088256, grad 0.012267, laplacian 0.000004, dIdt 0.000157
10it [00:28, 2.87s/it]
Epoch 19, Epoch loss: total 18906.075195, pixel 1.556313, grad 14.088123, laplacian 1575.002783, dIdt 17315.428027
Epoch 19, Epoch SSIM: pixel 0.085275, grad 0.012285, laplacian 0.000005, dIdt 0.000152
10it [00:32, 3.22s/it]
Epoch 20, Epoch loss: total 18944.514453, pixel 1.657550, grad 14.317643, laplacian 1644.753278, dIdt 17283.786035
Epoch 20, Epoch SSIM: pixel 0.082597, grad 0.012445, laplacian 0.000004, dIdt 0.000169
10it [00:28, 2.86s/it]
Epoch 21, Epoch loss: total 18981.415234, pixel 1.757625, grad 14.534469, laplacian 1712.593195, dIdt 17252.529687
Epoch 21, Epoch SSIM: pixel 0.080185, grad 0.012549, laplacian 0.000005, dIdt 0.000194
10it [00:28, 2.87s/it]
Epoch 22, Epoch loss: total 19016.640234, pixel 1.856717, grad 14.739813, laplacian 1778.412982, dIdt 17221.630859
Epoch 22, Epoch SSIM: pixel 0.078013, grad 0.012664, laplacian 0.000002, dIdt 0.000216
10it [00:28, 2.87s/it]
Epoch 23, Epoch loss: total 19050.021191, pixel 1.954870, grad 14.933782, laplacian 1842.047308, dIdt 17191.085254
Epoch 23, Epoch SSIM: pixel 0.076074, grad 0.013067, laplacian 0.000004, dIdt 0.000233
10it [00:28, 2.87s/it]
Epoch 24, Epoch loss: total 19081.007812, pixel 2.052225, grad 15.113869, laplacian 1902.857318, dIdt 17160.984570
Epoch 24, Epoch SSIM: pixel 0.074383, grad 0.013547, laplacian 0.000003, dIdt 0.000265
10it [00:29, 2.91s/it]
Epoch 25, Epoch loss: total 19109.131348, pixel 2.148830, grad 15.278922, laplacian 1960.260492, dIdt 17131.443164
Epoch 25, Epoch SSIM: pixel 0.072923, grad 0.013929, laplacian 0.000004, dIdt 0.000295
10it [00:28, 2.87s/it]
Epoch 26, Epoch loss: total 19134.867578, pixel 2.244286, grad 15.433079, laplacian 2014.660754, dIdt 17102.529004
Epoch 26, Epoch SSIM: pixel 0.071517, grad 0.014197, laplacian 0.000002, dIdt 0.000312
10it [00:28, 2.88s/it]
Epoch 27, Epoch loss: total 19160.071680, pixel 2.338096, grad 15.587047, laplacian 2067.966449, dIdt 17074.180176
Epoch 27, Epoch SSIM: pixel 0.070068, grad 0.014403, laplacian 0.000002, dIdt 0.000342
10it [00:28, 2.89s/it]
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Epoch 28, Epoch loss: total 19186.438672, pixel 2.430099, grad 15.746253, laplacian 2121.939691, dIdt 17046.322852
Epoch 28, Epoch SSIM: pixel 0.068720, grad 0.014405, laplacian 0.000003, dIdt 0.000366
10it [00:28, 2.87s/it]
Epoch 29, Epoch loss: total 19213.286230, pixel 2.520610, grad 15.899997, laplacian 2175.962726, dIdt 17018.902930
Epoch 29, Epoch SSIM: pixel 0.067686, grad 0.014199, laplacian 0.000003, dIdt 0.000383
10it [00:32, 3.25s/it]
Epoch 30, Epoch loss: total 19247.045312, pixel 2.608767, grad 16.089467, laplacian 2237.159296, dIdt 16991.187988
Epoch 30, Epoch SSIM: pixel 0.066742, grad 0.013898, laplacian 0.000003, dIdt 0.000406
10it [00:28, 2.87s/it]
Epoch 31, Epoch loss: total 19293.066602, pixel 2.694739, grad 16.336436, laplacian 2310.891364, dIdt 16963.143848
Epoch 31, Epoch SSIM: pixel 0.065666, grad 0.013629, laplacian 0.000003, dIdt 0.000444
10it [00:28, 2.87s/it]
Epoch 32, Epoch loss: total 19342.234473, pixel 2.778197, grad 16.561513, laplacian 2387.925287, dIdt 16934.969434
Epoch 32, Epoch SSIM: pixel 0.064519, grad 0.013521, laplacian 0.000004, dIdt 0.000487
10it [00:28, 2.90s/it]
Epoch 33, Epoch loss: total 19410.904785, pixel 2.856160, grad 16.860431, laplacian 2486.392816, dIdt 16904.795215
Epoch 33, Epoch SSIM: pixel 0.063292, grad 0.013538, laplacian 0.000004, dIdt 0.000513
10it [00:28, 2.86s/it]
Epoch 34, Epoch loss: total 19459.615625, pixel 2.939271, grad 16.964981, laplacian 2561.517694, dIdt 16878.193848
Epoch 34, Epoch SSIM: pixel 0.062832, grad 0.013692, laplacian 0.000003, dIdt 0.000519
10it [00:28, 2.87s/it]
Epoch 35, Epoch loss: total 19901.082813, pixel 2.913925, grad 18.762395, laplacian 3034.699719, dIdt 16844.706641
Epoch 35, Epoch SSIM: pixel 0.059110, grad 0.013257, laplacian 0.000003, dIdt 0.000485
10it [00:28, 2.88s/it]
Epoch 36, Epoch loss: total 20020.242578, pixel 3.096149, grad 18.283305, laplacian 2999.155298, dIdt 16999.707617
Epoch 36, Epoch SSIM: pixel 0.063848, grad 0.012535, laplacian 0.000003, dIdt 0.000726
10it [00:28, 2.85s/it]
Epoch 37, Epoch loss: total 21645.325781, pixel 2.600101, grad 22.033201, laplacian 4402.927380, dIdt 17217.765234
Epoch 37, Epoch SSIM: pixel 0.058928, grad 0.010746, laplacian 0.000001, dIdt 0.000275
10it [00:28, 2.87s/it]
Epoch 38, Epoch loss: total 22675.138770, pixel 3.215343, grad 21.720757, laplacian 5218.889227, dIdt 17431.313574
Epoch 38, Epoch SSIM: pixel 0.050096, grad 0.012430, laplacian 0.000002, dIdt 0.000277
10it [00:28, 2.87s/it]
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Epoch 39, Epoch loss: total 19879.904395, pixel 3.266903, grad 17.521819, laplacian 2872.785748, dIdt 16986.330078
Epoch 39, Epoch SSIM: pixel 0.055893, grad 0.013058, laplacian 0.000004, dIdt 0.000503
10it [00:31, 3.19s/it]
Epoch 40, Epoch loss: total 20045.249316, pixel 3.251195, grad 17.718050, laplacian 3133.812109, dIdt 16890.467871
Epoch 40, Epoch SSIM: pixel 0.057099, grad 0.012399, laplacian 0.000002, dIdt 0.000465
10it [00:28, 2.86s/it]
Epoch 41, Epoch loss: total 20430.552832, pixel 3.399712, grad 18.376570, laplacian 3559.362518, dIdt 16849.413965
Epoch 41, Epoch SSIM: pixel 0.055960, grad 0.012208, laplacian -0.000000, dIdt 0.000507
10it [00:28, 2.85s/it]
Epoch 42, Epoch loss: total 20044.008594, pixel 3.544525, grad 17.447281, laplacian 3207.821527, dIdt 16815.195215
Epoch 42, Epoch SSIM: pixel 0.054482, grad 0.012081, laplacian 0.000004, dIdt 0.000583
10it [00:28, 2.88s/it]
Epoch 43, Epoch loss: total 19683.500293, pixel 3.600641, grad 16.951171, laplacian 2894.015704, dIdt 16768.932910
Epoch 43, Epoch SSIM: pixel 0.053485, grad 0.012080, laplacian 0.000004, dIdt 0.000618
10it [00:28, 2.86s/it]
Epoch 44, Epoch loss: total 19529.618164, pixel 3.668522, grad 17.038573, laplacian 2774.730432, dIdt 16734.180469
Epoch 44, Epoch SSIM: pixel 0.052981, grad 0.011832, laplacian 0.000004, dIdt 0.000640
10it [00:28, 2.86s/it]
Epoch 45, Epoch loss: total 19440.094727, pixel 3.752442, grad 17.146915, laplacian 2713.067712, dIdt 16706.127539
Epoch 45, Epoch SSIM: pixel 0.052446, grad 0.011694, laplacian 0.000003, dIdt 0.000650
10it [00:28, 2.87s/it]
Epoch 46, Epoch loss: total 19429.654102, pixel 3.823897, grad 17.196896, laplacian 2736.253857, dIdt 16672.379395
Epoch 46, Epoch SSIM: pixel 0.051495, grad 0.011531, laplacian 0.000002, dIdt 0.000694
10it [00:28, 2.86s/it]
Epoch 47, Epoch loss: total 19510.182227, pixel 3.884369, grad 17.301136, laplacian 2846.421173, dIdt 16642.575488
Epoch 47, Epoch SSIM: pixel 0.051038, grad 0.011406, laplacian 0.000002, dIdt 0.000717
10it [00:28, 2.86s/it]
Epoch 48, Epoch loss: total 19638.458398, pixel 3.948661, grad 17.740774, laplacian 3006.306744, dIdt 16610.462305
Epoch 48, Epoch SSIM: pixel 0.050428, grad 0.011301, laplacian 0.000002, dIdt 0.000722
10it [00:28, 2.86s/it]
Epoch 49, Epoch loss: total 19766.325000, pixel 3.983240, grad 17.709190, laplacian 3151.252966, dIdt 16593.379199
Epoch 49, Epoch SSIM: pixel 0.050972, grad 0.011054, laplacian 0.000002, dIdt 0.000807
10it [00:32, 3.22s/it]
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Epoch 50, Epoch loss: total 20105.379590, pixel 4.001589, grad 19.039771, laplacian 3499.521307, dIdt 16582.817090
Epoch 50, Epoch SSIM: pixel 0.048720, grad 0.011050, laplacian 0.000002, dIdt 0.000649
10it [00:28, 2.87s/it]
Epoch 51, Epoch loss: total 20173.860352, pixel 4.187833, grad 18.793547, laplacian 3457.050140, dIdt 16693.828711
Epoch 51, Epoch SSIM: pixel 0.045523, grad 0.011124, laplacian 0.000002, dIdt 0.000789
10it [00:28, 2.88s/it]
Epoch 52, Epoch loss: total 20544.470313, pixel 4.137510, grad 20.579549, laplacian 3835.141022, dIdt 16684.612305
Epoch 52, Epoch SSIM: pixel 0.039462, grad 0.010978, laplacian 0.000002, dIdt 0.000678
10it [00:28, 2.87s/it]
Epoch 53, Epoch loss: total 20166.069531, pixel 4.229818, grad 19.648982, laplacian 3578.313062, dIdt 16563.877734
Epoch 53, Epoch SSIM: pixel 0.038493, grad 0.011450, laplacian 0.000002, dIdt 0.000727
10it [00:28, 2.85s/it]
Epoch 54, Epoch loss: total 20327.750586, pixel 4.261065, grad 19.904348, laplacian 3778.354639, dIdt 16525.230371
Epoch 54, Epoch SSIM: pixel 0.038501, grad 0.010889, laplacian 0.000003, dIdt 0.000796
10it [00:28, 2.88s/it]
Epoch 55, Epoch loss: total 20299.090137, pixel 4.282739, grad 19.308226, laplacian 3792.830261, dIdt 16482.668945
Epoch 55, Epoch SSIM: pixel 0.036567, grad 0.010248, laplacian 0.000002, dIdt 0.000817
10it [00:28, 2.86s/it]
Epoch 56, Epoch loss: total 20370.018945, pixel 4.359136, grad 19.452621, laplacian 3894.745172, dIdt 16451.462207
Epoch 56, Epoch SSIM: pixel 0.035995, grad 0.010363, laplacian 0.000003, dIdt 0.000828
10it [00:28, 2.85s/it]
Epoch 57, Epoch loss: total 20558.415918, pixel 4.445634, grad 20.021173, laplacian 4113.186218, dIdt 16420.762988
Epoch 57, Epoch SSIM: pixel 0.035649, grad 0.010385, laplacian 0.000003, dIdt 0.000837
10it [00:28, 2.86s/it]
Epoch 58, Epoch loss: total 20794.649121, pixel 4.485557, grad 20.239230, laplacian 4375.145044, dIdt 16394.779199
Epoch 58, Epoch SSIM: pixel 0.036003, grad 0.009873, laplacian 0.000002, dIdt 0.000912
10it [00:28, 2.86s/it]
Epoch 59, Epoch loss: total 21044.657520, pixel 4.555870, grad 20.937335, laplacian 4656.881921, dIdt 16362.282031
Epoch 59, Epoch SSIM: pixel 0.035482, grad 0.009947, laplacian 0.000002, dIdt 0.000887
10it [00:32, 3.22s/it]
Epoch 60, Epoch loss: total 21374.268652, pixel 4.553336, grad 21.103877, laplacian 4998.399060, dIdt 16350.212402
Epoch 60, Epoch SSIM: pixel 0.037972, grad 0.009539, laplacian 0.000001, dIdt 0.000947
10it [00:28, 2.89s/it]
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Epoch 61, Epoch loss: total 21654.656250, pixel 4.594090, grad 22.189933, laplacian 5299.683521, dIdt 16328.188965
Epoch 61, Epoch SSIM: pixel 0.037280, grad 0.009995, laplacian 0.000002, dIdt 0.000841
10it [00:28, 2.87s/it]
Epoch 62, Epoch loss: total 22183.601758, pixel 4.702855, grad 22.715267, laplacian 5804.682813, dIdt 16351.500977
Epoch 62, Epoch SSIM: pixel 0.039253, grad 0.009679, laplacian 0.000002, dIdt 0.000955
10it [00:28, 2.87s/it]
Epoch 63, Epoch loss: total 22208.655371, pixel 4.629560, grad 23.689398, laplacian 5832.361230, dIdt 16347.975098
Epoch 63, Epoch SSIM: pixel 0.036846, grad 0.009624, laplacian 0.000002, dIdt 0.000936
10it [00:28, 2.89s/it]
Epoch 64, Epoch loss: total 22300.975488, pixel 4.732196, grad 22.870955, laplacian 5979.084430, dIdt 16294.287891
Epoch 64, Epoch SSIM: pixel 0.038452, grad 0.009928, laplacian 0.000002, dIdt 0.000965
10it [00:28, 2.85s/it]
Epoch 65, Epoch loss: total 22509.126465, pixel 4.752667, grad 23.508544, laplacian 6249.468384, dIdt 16231.396777
Epoch 65, Epoch SSIM: pixel 0.036860, grad 0.008777, laplacian 0.000001, dIdt 0.000941
10it [00:28, 2.87s/it]
Epoch 66, Epoch loss: total 22594.202832, pixel 4.824607, grad 23.265887, laplacian 6374.713611, dIdt 16191.398438
Epoch 66, Epoch SSIM: pixel 0.037844, grad 0.008730, laplacian 0.000001, dIdt 0.001062
10it [00:28, 2.89s/it]
Epoch 67, Epoch loss: total 23007.720508, pixel 4.826198, grad 24.528404, laplacian 6835.335352, dIdt 16143.030176
Epoch 67, Epoch SSIM: pixel 0.037908, grad 0.008485, laplacian 0.000001, dIdt 0.001053
10it [00:28, 2.87s/it]
Epoch 68, Epoch loss: total 23457.071191, pixel 4.851448, grad 25.192149, laplacian 7314.738672, dIdt 16112.289160
Epoch 68, Epoch SSIM: pixel 0.037433, grad 0.008445, laplacian 0.000001, dIdt 0.001077
10it [00:28, 2.86s/it]
Epoch 69, Epoch loss: total 23666.760352, pixel 4.912322, grad 25.661070, laplacian 7559.075488, dIdt 16077.111719
Epoch 69, Epoch SSIM: pixel 0.037395, grad 0.008466, laplacian 0.000001, dIdt 0.001093
10it [00:32, 3.21s/it]
Epoch 70, Epoch loss: total 23915.199805, pixel 4.927559, grad 26.658335, laplacian 7833.017664, dIdt 16050.595996
Epoch 70, Epoch SSIM: pixel 0.037911, grad 0.007976, laplacian 0.000001, dIdt 0.001122
10it [00:28, 2.86s/it]
Epoch 71, Epoch loss: total 24652.720020, pixel 4.954615, grad 27.313102, laplacian 8618.433362, dIdt 16002.019238
Epoch 71, Epoch SSIM: pixel 0.037134, grad 0.008306, laplacian 0.000001, dIdt 0.001159
10it [00:28, 2.86s/it]
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Epoch 72, Epoch loss: total 24631.827148, pixel 5.033674, grad 28.007617, laplacian 8631.868835, dIdt 15966.917187
Epoch 72, Epoch SSIM: pixel 0.035396, grad 0.008070, laplacian 0.000001, dIdt 0.001176
10it [00:28, 2.87s/it]
Epoch 73, Epoch loss: total 25387.648633, pixel 5.041816, grad 28.951664, laplacian 9421.813855, dIdt 15931.841309
Epoch 73, Epoch SSIM: pixel 0.038066, grad 0.007429, laplacian 0.000001, dIdt 0.001245
10it [00:28, 2.88s/it]
Epoch 74, Epoch loss: total 25810.590625, pixel 5.107776, grad 30.264729, laplacian 9886.209790, dIdt 15889.008496
Epoch 74, Epoch SSIM: pixel 0.036597, grad 0.008320, laplacian 0.000001, dIdt 0.001197
10it [00:28, 2.89s/it]
Epoch 75, Epoch loss: total 26763.568066, pixel 5.090004, grad 30.702473, laplacian 10850.870679, dIdt 15876.904688
Epoch 75, Epoch SSIM: pixel 0.035555, grad 0.006540, laplacian 0.000001, dIdt 0.001301
10it [00:28, 2.90s/it]
Epoch 76, Epoch loss: total 26436.025977, pixel 5.139454, grad 30.866833, laplacian 10576.674951, dIdt 15823.345020
Epoch 76, Epoch SSIM: pixel 0.034533, grad 0.007587, laplacian 0.000001, dIdt 0.001234
10it [00:28, 2.88s/it]
Epoch 77, Epoch loss: total 27929.073633, pixel 5.190219, grad 33.999076, laplacian 12059.899048, dIdt 15829.985645
Epoch 77, Epoch SSIM: pixel 0.031349, grad 0.007090, laplacian 0.000001, dIdt 0.001342
10it [00:28, 2.87s/it]
Epoch 78, Epoch loss: total 27409.225977, pixel 5.268586, grad 32.772656, laplacian 11633.835938, dIdt 15737.348633
Epoch 78, Epoch SSIM: pixel 0.033066, grad 0.007793, laplacian 0.000000, dIdt 0.001304
10it [00:28, 2.90s/it]
Epoch 79, Epoch loss: total 29693.579102, pixel 5.308652, grad 35.132863, laplacian 13897.595264, dIdt 15755.542187
Epoch 79, Epoch SSIM: pixel 0.034808, grad 0.005769, laplacian 0.000000, dIdt 0.001351
10it [00:32, 3.23s/it]
Epoch 80, Epoch loss: total 29771.827148, pixel 5.339728, grad 36.947155, laplacian 14068.228003, dIdt 15661.312695
Epoch 80, Epoch SSIM: pixel 0.032685, grad 0.007974, laplacian 0.000000, dIdt 0.001378
-----Finished-----
-----Generating Data-----
100%|██████████| 10/10 [00:00<00:00, 1263.42it/s]
-----Finished-----
```

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10it [00:19,  1.92s/it]
ffmpeg version 4.1.9-0+deb10u1 Copyright (c) 2000-2022 the FFmpeg developers
  built with gcc 8 (Debian 8.3.0-6)
  configuration: --prefix=/usr --extra-version=0+deb10u1 --toolchain=hardened
  --libdir=/usr/lib/x86_64-linux-gnu --incdir=/usr/include/x86_64-linux-gnu --arch=amd64 --enable-gpl --disable-stripping --enable-avresample --disable-filter=resample --enable-avisynth --enable-gnutls --enable-ladspa --enable-libaom --enable-libass --enable-libbluray --enable-libbs2b --enable-libcaca --enable-libcdio --enable-libcodec2 --enable-libflite --enable-libfontconfig --enable-libfreetype --enable-libfribidi --enable-libgme --enable-libgsm --enable-libjack --enable-libmp3lame --enable-libmysofa --enable-libopenjpeg --enable-libopenmp3 --enable-libopus --enable-libpulse --enable-librsvg --enable-librubberband --enable-libshine --enable-libsنappy --enable-libsoxr --enable-libspeex --enable-libssh --enable-libtheora --enable-libtwolame --enable-libvidstab --enable-libvorbis --enable-libvpx --enable-libwavpack --enable-libwebp --enable-libx265 --enable-libxml2 --enable-libxvid --enable-libzmq --enable-libzvbi --enable-lv2 --enable-omx --enable-openal --enable-opengl --enable-sdl2 --enable-libdc1394 --enable-libdrm --enable-libiec61883 --enable-chromaprint --enable-frei0r --enable-libx264 --enable-shared

  libavutil      56. 22.100 / 56. 22.100
  libavcodec     58. 35.100 / 58. 35.100
  libavformat    58. 20.100 / 58. 20.100
  libavdevice     58.  5.100 / 58.  5.100
  libavfilter     7. 40.101 /  7. 40.101
  libavresample   4.  0.  0 /  4.  0.  0
  libswscale      5.  3.100 /  5.  3.100
  libswresample   3.  3.100 /  3.  3.100
  libpostproc    55.  3.100 / 55.  3.100

Input #0, image2, from 'tmp/file%02d.png':
  Duration: 00:00:05.00, start: 0.000000, bitrate: N/A
    Stream #0:0: Video: png, rgba(pc), 1296x432 [SAR 2835:2835 DAR 3:1], 2 fps, 2 tbr, 2 tbn, 2 tbc
    Stream mapping:
      Stream #0:0 -> #0:0 (png (native) -> h264 (libx264))
    Press [q] to stop, [?] for help
[libx264 @ 0x55597f680f00] using SAR=1/1
[libx264 @ 0x55597f680f00] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2 AVX FMA3 BMI2 AVX2
[libx264 @ 0x55597f680f00] profile High, level 3.1
[libx264 @ 0x55597f680f00] 264 - core 155 r2917 0a84d98 - H.264/MPEG-4 AVC codec - Copyleft 2003-2018 - http://www.videolan.org/x264.html - options: cabac=1 ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00:0.00 mixed_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast_pskip=1 chroma_qp_offset=-2 threads=3 lookahead_threads=1 sliced_threads=0 nr=0 decimate=1 interlaced=0 bluray_compat=0 constrained_intra=0 bframes=3 b_pyr amid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 keyint_min=25 scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=2.3.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ratio=1.40 aq=1:1.00
Output #0, mp4, to '/home/jupyter/videos/runs/cameraman/experiments/1.0_1.0_1.0_1.0/siren_uniformlr_1e-05_video.mp4':
  Metadata:
    encoder : Lavf58.20.100
  Stream #0:0: Video: h264 (libx264) (avc1 / 0x31637661), yuv420p, 1296x432 [SAR 1:1 DAR 3:1], q=-1---, 30 fps, 15360 tbn, 30 tbc
  Metadata:
    encoder : Lavc58.35.100 libx264
  Side data:
    cpb: bitrate max/min/avg: 0/0/0 buffer size: 0 vbv_delay: -1
    frame= 150 fps=101 q=-1.0 Lsize= 229kB time=00:00:04.90 bitrate= 382.3kbit/s dup=140 drop=0 speed= 3.3x

```

```
video:226kB audio:0kB subtitle:0kB other streams:0kB global headers:0kB muxing overhead: 1.145617%
[libx264 @ 0x55597f680f00] frame I:1      Avg QP:16.18  size: 46500
[libx264 @ 0x55597f680f00] frame P:38     Avg QP:19.46  size: 4611
[libx264 @ 0x55597f680f00] frame B:111    Avg QP:14.63  size:     82
[libx264 @ 0x55597f680f00] consecutive B-frames: 1.3% 0.0% 0.0% 98.7%
[libx264 @ 0x55597f680f00] mb I  I16..4: 54.4% 20.8% 24.9%
[libx264 @ 0x55597f680f00] mb P  I16..4:  0.6%  2.4%  0.8%  P16..4:  3.7%  0.
9% 1.0% 0.0% 0.0%  skip:90.6%
[libx264 @ 0x55597f680f00] mb B  I16..4:  0.1%  0.0%  0.0%  B16..8:  2.9%  0.
0% 0.0% direct: 0.0% skip:97.0% L0:47.5% L1:52.4% BI: 0.1%
[libx264 @ 0x55597f680f00] 8x8 transform intra:44.7% inter:60.8%
[libx264 @ 0x55597f680f00] coded y,uvDC,uvAC intra: 57.7% 64.7% 61.3% inter:
0.8% 1.1% 0.7%
[libx264 @ 0x55597f680f00] i16 v,h,dc,p: 72% 21% 7% 1%
[libx264 @ 0x55597f680f00] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 16% 14% 16% 7% 8%
9% 8% 11% 11%
[libx264 @ 0x55597f680f00] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 29% 26% 16% 5% 5%
5% 5% 4%
[libx264 @ 0x55597f680f00] i8c dc,h,v,p: 49% 22% 21% 8%
[libx264 @ 0x55597f680f00] Weighted P-Frames: Y:0.0% UV:0.0%
[libx264 @ 0x55597f680f00] ref P L0: 73.6% 19.0% 6.7% 0.8%
[libx264 @ 0x55597f680f00] ref B L0: 70.4% 29.1% 0.6%
[libx264 @ 0x55597f680f00] ref B L1: 97.6% 2.4%
[libx264 @ 0x55597f680f00] kb/s:369.28
```

-----Generating Data-----

100%|██████████| 10/10 [00:00<00:00, 1223.97it/s]

-----Finished-----

-----Begin Training-----

10it [00:28, 2.84s/it]

Epoch 1, Epoch loss: total 17963.921289, pixel 0.315567, grad 7.892523, laplacian 30.836077, dIdt 17924.877344

Epoch 1, Epoch SSIM: pixel 0.047990, grad 0.044901, laplacian 0.000072, dIdt 0.006035

10it [00:28, 2.89s/it]

Epoch 2, Epoch loss: total 17961.170898, pixel 0.315468, grad 7.891831, laplacian 30.833702, dIdt 17922.129883

Epoch 2, Epoch SSIM: pixel 0.049619, grad 0.044919, laplacian 0.000083, dIdt 0.005948

10it [00:29, 2.97s/it]

Epoch 3, Epoch loss: total 17959.746777, pixel 0.315373, grad 7.891624, laplacian 30.915127, dIdt 17920.624512

Epoch 3, Epoch SSIM: pixel 0.050909, grad 0.044878, laplacian 0.000070, dIdt 0.005799

10it [00:28, 2.89s/it]

Epoch 4, Epoch loss: total 17958.490820, pixel 0.315283, grad 7.891667, laplacian 31.060537, dIdt 17919.223145

Epoch 4, Epoch SSIM: pixel 0.052160, grad 0.044795, laplacian 0.000072, dIdt 0.005633

10it [00:28, 2.88s/it]

Epoch 5, Epoch loss: total 17957.318750, pixel 0.315199, grad 7.891949, laplacian 31.268891, dIdt 17917.842578

Epoch 5, Epoch SSIM: pixel 0.053408, grad 0.044670, laplacian 0.000059, dIdt 0.005478

10it [00:28, 2.88s/it]

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Epoch 6, Epoch loss: total 17956.207031, pixel 0.315122, grad 7.892474, laplacian 31.541250, dIdt 17916.458203
Epoch 6, Epoch SSIM: pixel 0.054665, grad 0.044506, laplacian 0.000066, dIdt 0.005343
10it [00:28, 2.88s/it]
Epoch 7, Epoch loss: total 17955.149805, pixel 0.315052, grad 7.893250, laplacian 31.879250, dIdt 17915.062402
Epoch 7, Epoch SSIM: pixel 0.055939, grad 0.044309, laplacian 0.000072, dIdt 0.005207
10it [00:28, 2.88s/it]
Epoch 8, Epoch loss: total 17954.143066, pixel 0.314990, grad 7.894286, laplacian 32.284867, dIdt 17913.648828
Epoch 8, Epoch SSIM: pixel 0.057235, grad 0.044082, laplacian 0.000071, dIdt 0.005073
10it [00:28, 2.87s/it]
Epoch 9, Epoch loss: total 17953.183496, pixel 0.314934, grad 7.895597, laplacian 32.760408, dIdt 17912.212598
Epoch 9, Epoch SSIM: pixel 0.058555, grad 0.043825, laplacian 0.000076, dIdt 0.004907
10it [00:32, 3.23s/it]
Epoch 10, Epoch loss: total 17952.271680, pixel 0.314887, grad 7.897195, laplacian 33.308544, dIdt 17910.751172
Epoch 10, Epoch SSIM: pixel 0.059904, grad 0.043538, laplacian 0.000088, dIdt 0.004743
10it [00:28, 2.88s/it]
Epoch 11, Epoch loss: total 17951.406836, pixel 0.314847, grad 7.899097, laplacian 33.932326, dIdt 17909.260352
Epoch 11, Epoch SSIM: pixel 0.061283, grad 0.043220, laplacian 0.000091, dIdt 0.004563
10it [00:28, 2.90s/it]
Epoch 12, Epoch loss: total 17950.587109, pixel 0.314816, grad 7.901322, laplacian 34.635218, dIdt 17907.735742
Epoch 12, Epoch SSIM: pixel 0.062694, grad 0.042871, laplacian 0.000081, dIdt 0.004450
10it [00:29, 2.90s/it]
Epoch 13, Epoch loss: total 17949.814844, pixel 0.314794, grad 7.903890, laplacian 35.421110, dIdt 17906.175098
Epoch 13, Epoch SSIM: pixel 0.064140, grad 0.042486, laplacian 0.000079, dIdt 0.004388
10it [00:28, 2.88s/it]
Epoch 14, Epoch loss: total 17949.088281, pixel 0.314782, grad 7.906826, laplacian 36.294333, dIdt 17904.572363
Epoch 14, Epoch SSIM: pixel 0.065622, grad 0.042062, laplacian 0.000079, dIdt 0.004330
10it [00:28, 2.89s/it]
Epoch 15, Epoch loss: total 17948.409766, pixel 0.314781, grad 7.910153, laplacian 37.259678, dIdt 17902.924902
Epoch 15, Epoch SSIM: pixel 0.067141, grad 0.041593, laplacian 0.000076, dIdt 0.004276
10it [00:28, 2.88s/it]
Epoch 16, Epoch loss: total 17947.779297, pixel 0.314791, grad 7.913901, laplacian 38.322405, dIdt 17901.228223
Epoch 16, Epoch SSIM: pixel 0.068698, grad 0.041076, laplacian 0.000072, dIdt 0.004176
10it [00:29, 2.91s/it]
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Epoch 17, Epoch loss: total 17947.199414, pixel 0.314813, grad 7.918101, lapla
cian 39.488302, dIdt 17899.478027
Epoch 17, Epoch SSIM: pixel 0.070293, grad 0.040514, laplacian 0.000066, dIdt
0.004023
10it [00:28, 2.89s/it]
Epoch 18, Epoch loss: total 17946.671484, pixel 0.314849, grad 7.922787, lapla
cian 40.763676, dIdt 17897.670215
Epoch 18, Epoch SSIM: pixel 0.071929, grad 0.039917, laplacian 0.000058, dIdt
0.003915
10it [00:28, 2.87s/it]
Epoch 19, Epoch loss: total 17946.198437, pixel 0.314900, grad 7.927994, lapla
cian 42.155389, dIdt 17895.800391
Epoch 19, Epoch SSIM: pixel 0.073605, grad 0.039287, laplacian 0.000050, dIdt
0.003846
10it [00:32, 3.24s/it]
Epoch 20, Epoch loss: total 17945.784277, pixel 0.314966, grad 7.933764, lapla
cian 43.670904, dIdt 17893.864648
Epoch 20, Epoch SSIM: pixel 0.075320, grad 0.038634, laplacian 0.000054, dIdt
0.003725
10it [00:28, 2.87s/it]
Epoch 21, Epoch loss: total 17945.431543, pixel 0.315050, grad 7.940138, lapla
cian 45.318318, dIdt 17891.857910
Epoch 21, Epoch SSIM: pixel 0.077074, grad 0.037963, laplacian 0.000059, dIdt
0.003574
10it [00:28, 2.90s/it]
Epoch 22, Epoch loss: total 17945.143066, pixel 0.315153, grad 7.947164, lapla
cian 47.106395, dIdt 17889.774512
Epoch 22, Epoch SSIM: pixel 0.078864, grad 0.037279, laplacian 0.000054, dIdt
0.003439
10it [00:28, 2.88s/it]
Epoch 23, Epoch loss: total 17944.926074, pixel 0.315277, grad 7.954892, lapla
cian 49.044631, dIdt 17887.611230
Epoch 23, Epoch SSIM: pixel 0.080688, grad 0.036585, laplacian 0.000053, dIdt
0.003260
10it [00:28, 2.90s/it]
Epoch 24, Epoch loss: total 17944.783691, pixel 0.315424, grad 7.963376, lapla
cian 51.143277, dIdt 17885.361621
Epoch 24, Epoch SSIM: pixel 0.082544, grad 0.035883, laplacian 0.000051, dIdt
0.003056
10it [00:28, 2.89s/it]
Epoch 25, Epoch loss: total 17944.724414, pixel 0.315596, grad 7.972675, lapla
cian 53.413416, dIdt 17883.022656
Epoch 25, Epoch SSIM: pixel 0.084427, grad 0.035173, laplacian 0.000046, dIdt
0.002844
10it [00:28, 2.86s/it]
Epoch 26, Epoch loss: total 17944.752344, pixel 0.315796, grad 7.982852, lapla
cian 55.866992, dIdt 17880.586621
Epoch 26, Epoch SSIM: pixel 0.086334, grad 0.034452, laplacian 0.000048, dIdt
0.002672
10it [00:28, 2.86s/it]
Epoch 27, Epoch loss: total 17944.877441, pixel 0.316026, grad 7.993973, lapla
cian 58.516892, dIdt 17878.050293
Epoch 27, Epoch SSIM: pixel 0.088261, grad 0.033716, laplacian 0.000047, dIdt
0.002525
10it [00:28, 2.89s/it]
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Epoch 28, Epoch loss: total 17945.106250, pixel 0.316290, grad 8.006113, lapla
cian 61.376957, dIdt 17875.406836
Epoch 28, Epoch SSIM: pixel 0.090202, grad 0.032971, laplacian 0.000046, dIdt
0.002409
10it [00:28, 2.87s/it]
Epoch 29, Epoch loss: total 17945.449512, pixel 0.316590, grad 8.019349, lapla
cian 64.462068, dIdt 17872.651758
Epoch 29, Epoch SSIM: pixel 0.092153, grad 0.032220, laplacian 0.000053, dIdt
0.002326
10it [00:32, 3.21s/it]
Epoch 30, Epoch loss: total 17945.918164, pixel 0.316931, grad 8.033765, lapla
cian 67.788144, dIdt 17869.779199
Epoch 30, Epoch SSIM: pixel 0.094107, grad 0.031463, laplacian 0.000044, dIdt
0.002298
10it [00:28, 2.86s/it]
Epoch 31, Epoch loss: total 17946.522070, pixel 0.317317, grad 8.049450, lapla
cian 71.372224, dIdt 17866.783203
Epoch 31, Epoch SSIM: pixel 0.096059, grad 0.030703, laplacian 0.000035, dIdt
0.002136
10it [00:28, 2.86s/it]
Epoch 32, Epoch loss: total 17947.275879, pixel 0.317751, grad 8.066500, lapla
cian 75.232420, dIdt 17863.658984
Epoch 32, Epoch SSIM: pixel 0.098004, grad 0.029940, laplacian 0.000032, dIdt
0.001901
10it [00:28, 2.85s/it]
Epoch 33, Epoch loss: total 17948.191211, pixel 0.318240, grad 8.085015, lapla
cian 79.387975, dIdt 17860.399902
Epoch 33, Epoch SSIM: pixel 0.099935, grad 0.029171, laplacian 0.000037, dIdt
0.001744
10it [00:28, 2.88s/it]
Epoch 34, Epoch loss: total 17949.284277, pixel 0.318788, grad 8.105103, lapla
cian 83.859200, dIdt 17857.001465
Epoch 34, Epoch SSIM: pixel 0.101846, grad 0.028393, laplacian 0.000034, dIdt
0.001619
10it [00:28, 2.85s/it]
Epoch 35, Epoch loss: total 17950.570605, pixel 0.319402, grad 8.126876, lapla
cian 88.667467, dIdt 17853.457031
Epoch 35, Epoch SSIM: pixel 0.103731, grad 0.027611, laplacian 0.000030, dIdt
0.001485
10it [00:28, 2.87s/it]
Epoch 36, Epoch loss: total 17952.068945, pixel 0.320087, grad 8.150454, lapla
cian 93.835117, dIdt 17849.763086
Epoch 36, Epoch SSIM: pixel 0.105585, grad 0.026827, laplacian 0.000035, dIdt
0.001363
10it [00:28, 2.89s/it]
Epoch 37, Epoch loss: total 17953.795508, pixel 0.320853, grad 8.175960, lapla
cian 99.385317, dIdt 17845.913379
Epoch 37, Epoch SSIM: pixel 0.107402, grad 0.026048, laplacian 0.000030, dIdt
0.001259
10it [00:28, 2.87s/it]
Epoch 38, Epoch loss: total 17955.771191, pixel 0.321705, grad 8.203521, lapla
cian 105.341981, dIdt 17841.904395
Epoch 38, Epoch SSIM: pixel 0.109176, grad 0.025280, laplacian 0.000026, dIdt
0.001178
10it [00:28, 2.87s/it]
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Epoch 39, Epoch loss: total 17958.017969, pixel 0.322654, grad 8.233267, lapla
cian 111.729504, dIdt 17837.732715
Epoch 39, Epoch SSIM: pixel 0.110901, grad 0.024528, laplacian 0.000029, dIdt
0.001099
10it [00:32, 3.23s/it]
Epoch 40, Epoch loss: total 17960.555566, pixel 0.323708, grad 8.265332, lapla
cian 118.572615, dIdt 17833.393750
Epoch 40, Epoch SSIM: pixel 0.112573, grad 0.023793, laplacian 0.000026, dIdt
0.001010
10it [00:28, 2.88s/it]
Epoch 41, Epoch loss: total 17963.405078, pixel 0.324878, grad 8.299847, lapla
cian 125.896016, dIdt 17828.884570
Epoch 41, Epoch SSIM: pixel 0.114187, grad 0.023075, laplacian 0.000020, dIdt
0.000950
10it [00:28, 2.86s/it]
Epoch 42, Epoch loss: total 17966.591895, pixel 0.326173, grad 8.336946, lapla
cian 133.724106, dIdt 17824.204883
Epoch 42, Epoch SSIM: pixel 0.115738, grad 0.022373, laplacian 0.000017, dIdt
0.000886
10it [00:28, 2.88s/it]
Epoch 43, Epoch loss: total 17970.137988, pixel 0.327605, grad 8.376754, lapla
cian 142.080533, dIdt 17819.353516
Epoch 43, Epoch SSIM: pixel 0.117223, grad 0.021688, laplacian 0.000015, dIdt
0.000814
10it [00:28, 2.87s/it]
Epoch 44, Epoch loss: total 17974.066113, pixel 0.329187, grad 8.419395, lapla
cian 150.987859, dIdt 17814.329688
Epoch 44, Epoch SSIM: pixel 0.118638, grad 0.021021, laplacian 0.000010, dIdt
0.000744
10it [00:28, 2.87s/it]
Epoch 45, Epoch loss: total 17978.398438, pixel 0.330930, grad 8.464981, lapla
cian 160.467003, dIdt 17809.135645
Epoch 45, Epoch SSIM: pixel 0.119979, grad 0.020376, laplacian 0.000015, dIdt
0.000675
10it [00:28, 2.89s/it]
Epoch 46, Epoch loss: total 17983.155859, pixel 0.332848, grad 8.513613, lapla
cian 170.536765, dIdt 17803.773047
Epoch 46, Epoch SSIM: pixel 0.121242, grad 0.019754, laplacian 0.000014, dIdt
0.000611
10it [00:28, 2.88s/it]
Epoch 47, Epoch loss: total 17988.360352, pixel 0.334952, grad 8.565379, lapla
cian 181.213318, dIdt 17798.246875
Epoch 47, Epoch SSIM: pixel 0.122425, grad 0.019156, laplacian 0.000014, dIdt
0.000551
10it [00:28, 2.88s/it]
Epoch 48, Epoch loss: total 17994.029395, pixel 0.337258, grad 8.620345, lapla
cian 192.509605, dIdt 17792.562207
Epoch 48, Epoch SSIM: pixel 0.123526, grad 0.018582, laplacian 0.000010, dIdt
0.000502
10it [00:28, 2.90s/it]
Epoch 49, Epoch loss: total 18000.179004, pixel 0.339778, grad 8.678562, lapla
cian 204.434988, dIdt 17786.725586
Epoch 49, Epoch SSIM: pixel 0.124543, grad 0.018031, laplacian 0.000012, dIdt
0.000464
10it [00:32, 3.24s/it]
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Epoch 50, Epoch loss: total 18006.821582, pixel 0.342524, grad 8.740053, lapla
cian 216.994597, dIdt 17780.744531
Epoch 50, Epoch SSIM: pixel 0.125473, grad 0.017499, laplacian 0.000011, dIdt
0.000421
10it [00:28, 2.89s/it]
Epoch 51, Epoch loss: total 18013.969727, pixel 0.345511, grad 8.804816, lapla
cian 230.188913, dIdt 17774.630273
Epoch 51, Epoch SSIM: pixel 0.126317, grad 0.016992, laplacian 0.000011, dIdt
0.000376
10it [00:28, 2.88s/it]
Epoch 52, Epoch loss: total 18021.627539, pixel 0.348749, grad 8.872824, lapla
cian 244.013541, dIdt 17768.392188
Epoch 52, Epoch SSIM: pixel 0.127073, grad 0.016511, laplacian 0.000011, dIdt
0.000337
10it [00:29, 2.93s/it]
Epoch 53, Epoch loss: total 18029.796973, pixel 0.352250, grad 8.944015, lapla
cian 258.458675, dIdt 17762.041895
Epoch 53, Epoch SSIM: pixel 0.127742, grad 0.016056, laplacian 0.000008, dIdt
0.000302
10it [00:28, 2.88s/it]
Epoch 54, Epoch loss: total 18038.477539, pixel 0.356025, grad 9.018301, lapla
cian 273.509149, dIdt 17755.594043
Epoch 54, Epoch SSIM: pixel 0.128325, grad 0.015626, laplacian 0.000010, dIdt
0.000255
10it [00:28, 2.88s/it]
Epoch 55, Epoch loss: total 18047.660840, pixel 0.360083, grad 9.095559, lapla
cian 289.144272, dIdt 17749.061035
Epoch 55, Epoch SSIM: pixel 0.128821, grad 0.015219, laplacian 0.000010, dIdt
0.000223
10it [00:28, 2.90s/it]
Epoch 56, Epoch loss: total 18057.335449, pixel 0.364431, grad 9.175641, lapla
cian 305.337985, dIdt 17742.457422
Epoch 56, Epoch SSIM: pixel 0.129234, grad 0.014835, laplacian 0.000010, dIdt
0.000202
10it [00:29, 2.90s/it]
Epoch 57, Epoch loss: total 18067.485449, pixel 0.369076, grad 9.258364, lapla
cian 322.058936, dIdt 17735.799023
Epoch 57, Epoch SSIM: pixel 0.129563, grad 0.014472, laplacian 0.000010, dIdt
0.000183
10it [00:28, 2.86s/it]
Epoch 58, Epoch loss: total 18078.089160, pixel 0.374023, grad 9.343523, lapla
cian 339.270822, dIdt 17729.100781
Epoch 58, Epoch SSIM: pixel 0.129810, grad 0.014129, laplacian 0.000010, dIdt
0.000169
10it [00:29, 2.91s/it]
Epoch 59, Epoch loss: total 18089.120410, pixel 0.379273, grad 9.430884, lapla
cian 356.932990, dIdt 17722.377148
Epoch 59, Epoch SSIM: pixel 0.129980, grad 0.013805, laplacian 0.000010, dIdt
0.000159
10it [00:32, 3.21s/it]
Epoch 60, Epoch loss: total 18100.550195, pixel 0.384829, grad 9.520195, lapla
cian 375.000885, dIdt 17715.644043
Epoch 60, Epoch SSIM: pixel 0.130075, grad 0.013500, laplacian 0.000009, dIdt
0.000141
10it [00:28, 2.89s/it]
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Epoch 61, Epoch loss: total 18112.343066, pixel 0.390687, grad 9.611186, lapla
cian 393.426712, dIdt 17708.914551
Epoch 61, Epoch SSIM: pixel 0.130099, grad 0.013213, laplacian 0.000008, dIdt
0.000132
10it [00:29, 2.90s/it]
Epoch 62, Epoch loss: total 18124.464746, pixel 0.396847, grad 9.703573, lapla
cian 412.160251, dIdt 17702.204102
Epoch 62, Epoch SSIM: pixel 0.130057, grad 0.012939, laplacian 0.000007, dIdt
0.000126
10it [00:28, 2.88s/it]
Epoch 63, Epoch loss: total 18136.874219, pixel 0.403302, grad 9.797064, lapla
cian 431.149564, dIdt 17695.524219
Epoch 63, Epoch SSIM: pixel 0.129952, grad 0.012680, laplacian 0.000009, dIdt
0.000119
10it [00:28, 2.87s/it]
Epoch 64, Epoch loss: total 18149.531055, pixel 0.410046, grad 9.891364, lapla
cian 450.342111, dIdt 17688.887793
Epoch 64, Epoch SSIM: pixel 0.129787, grad 0.012435, laplacian 0.000009, dIdt
0.000115
10it [00:28, 2.89s/it]
Epoch 65, Epoch loss: total 18162.392969, pixel 0.417071, grad 9.986178, lapla
cian 469.685330, dIdt 17682.304590
Epoch 65, Epoch SSIM: pixel 0.129567, grad 0.012203, laplacian 0.000008, dIdt
0.000112
10it [00:28, 2.88s/it]
Epoch 66, Epoch loss: total 18175.418750, pixel 0.424366, grad 10.081217, lapl
acian 489.127469, dIdt 17675.785547
Epoch 66, Epoch SSIM: pixel 0.129293, grad 0.011981, laplacian 0.000007, dIdt
0.000114
10it [00:28, 2.89s/it]
Epoch 67, Epoch loss: total 18188.564160, pixel 0.431920, grad 10.176199, lapl
acian 508.618170, dIdt 17669.337793
Epoch 67, Epoch SSIM: pixel 0.128969, grad 0.011772, laplacian 0.000006, dIdt
0.000116
10it [00:28, 2.87s/it]
Epoch 68, Epoch loss: total 18201.789551, pixel 0.439721, grad 10.270858, lapl
acian 528.109280, dIdt 17662.969629
Epoch 68, Epoch SSIM: pixel 0.128597, grad 0.011573, laplacian 0.000005, dIdt
0.000114
10it [00:28, 2.88s/it]
Epoch 69, Epoch loss: total 18215.053516, pixel 0.447757, grad 10.364940, lapl
acian 547.555255, dIdt 17656.685742
Epoch 69, Epoch SSIM: pixel 0.128184, grad 0.011384, laplacian 0.000005, dIdt
0.000107
10it [00:32, 3.21s/it]
Epoch 70, Epoch loss: total 18228.320508, pixel 0.456012, grad 10.458211, lapl
acian 566.913638, dIdt 17650.492773
Epoch 70, Epoch SSIM: pixel 0.127733, grad 0.011207, laplacian 0.000005, dIdt
0.000100
10it [00:28, 2.87s/it]
Epoch 71, Epoch loss: total 18241.551855, pixel 0.464473, grad 10.550456, lapl
acian 586.145111, dIdt 17644.392188
Epoch 71, Epoch SSIM: pixel 0.127249, grad 0.011042, laplacian 0.000004, dIdt
0.000095
10it [00:28, 2.87s/it]
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Epoch 72, Epoch loss: total 18254.716895, pixel 0.473126, grad 10.641477, laplacian 605.213876, dIdt 17638.388379
Epoch 72, Epoch SSIM: pixel 0.126735, grad 0.010888, laplacian 0.000006, dIdt 0.000092
10it [00:28, 2.87s/it]
Epoch 73, Epoch loss: total 18267.783105, pixel 0.481955, grad 10.731100, laplacian 624.087589, dIdt 17632.482227
Epoch 73, Epoch SSIM: pixel 0.126195, grad 0.010746, laplacian 0.000005, dIdt 0.000090
10it [00:28, 2.90s/it]
Epoch 74, Epoch loss: total 18280.721973, pixel 0.490946, grad 10.819171, laplacian 642.737195, dIdt 17626.674805
Epoch 74, Epoch SSIM: pixel 0.125631, grad 0.010613, laplacian 0.000004, dIdt 0.000090
10it [00:28, 2.86s/it]
Epoch 75, Epoch loss: total 18293.509961, pixel 0.500084, grad 10.905554, laplacian 661.137134, dIdt 17620.967285
Epoch 75, Epoch SSIM: pixel 0.125048, grad 0.010488, laplacian 0.000006, dIdt 0.000088
10it [00:28, 2.86s/it]
Epoch 76, Epoch loss: total 18306.123535, pixel 0.509354, grad 10.990134, laplacian 679.265033, dIdt 17615.359180
Epoch 76, Epoch SSIM: pixel 0.124448, grad 0.010373, laplacian 0.000006, dIdt 0.000089
10it [00:28, 2.85s/it]
Epoch 77, Epoch loss: total 18318.542383, pixel 0.518743, grad 11.072815, laplacian 697.101645, dIdt 17609.848828
Epoch 77, Epoch SSIM: pixel 0.123833, grad 0.010267, laplacian 0.000007, dIdt 0.000090
10it [00:28, 2.86s/it]
Epoch 78, Epoch loss: total 18330.748340, pixel 0.528238, grad 11.153517, laplacian 714.630688, dIdt 17604.435840
Epoch 78, Epoch SSIM: pixel 0.123205, grad 0.010170, laplacian 0.000006, dIdt 0.000089
10it [00:28, 2.86s/it]
Epoch 79, Epoch loss: total 18342.727344, pixel 0.537825, grad 11.232181, laplacian 731.838745, dIdt 17599.118652
Epoch 79, Epoch SSIM: pixel 0.122565, grad 0.010082, laplacian 0.000004, dIdt 0.000094
10it [00:32, 3.24s/it]
Epoch 80, Epoch loss: total 18354.466211, pixel 0.547493, grad 11.308758, laplacian 748.714862, dIdt 17593.895020
Epoch 80, Epoch SSIM: pixel 0.121918, grad 0.010002, laplacian 0.000006, dIdt 0.000107
-----Finished-----
-----Generating Data-----
100%|██████████| 10/10 [00:00<00:00, 1174.91it/s]
-----Finished-----
```

```

0it [00:00, ?it/s]/opt/conda/lib/python3.7/site-packages/ipykernel_launcher.py:24: RuntimeWarning: More than 20 figures have been opened. Figures created through the pyplot interface (`matplotlib.pyplot.figure`) are retained until explicitly closed and may consume too much memory. (To control this warning, see the rcParam `figure.max_open_warning`).
10it [00:19,  1.90s/it]
ffmpeg version 4.1.9-0+deb10u1 Copyright (c) 2000-2022 the FFmpeg developers
  built with gcc 8 (Debian 8.3.0-6)
  configuration: --prefix=/usr --extra-version=0+deb10u1 --toolchain=hardened
  --libdir=/usr/lib/x86_64-linux-gnu --incdir=/usr/include/x86_64-linux-gnu --arch=amd64 --enable-gpl --disable-stripping --enable-avresample --disable-filter=resample --enable-avisynth --enable-gnutls --enable-ladspa --enable-libaom --enable-libass --enable-libbluray --enable-libbs2b --enable-libcaca --enable-libcdio --enable-libcodec2 --enable-libflite --enable-libfontconfig --enable-libfreetype --enable-libfribidi --enable-libgme --enable-libgsm --enable-libjack --enable-libmp3lame --enable-libmysofa --enable-libopenjpeg --enable-libopenmp3 --enable-libopus --enable-libpulse --enable-librsvg --enable-librubberband --enable-libshine --enable-libsنappy --enable-libsoxr --enable-libspeex --enable-libssh --enable-libtheora --enable-libtwolame --enable-libvidstab --enable-libvorbis --enable-libvpx --enable-libwpack --enable-libwebp --enable-libx265 --enable-libxml2 --enable-libxvid --enable-libzmq --enable-libzvbi --enable-lv2 --enable-omx --enable-openal --enable-opengl --enable-sdl2 --enable-libdc1394 --enable-libdrm --enable-libiec61883 --enable-chromaprint --enable-frei0r --enable-libx264 --enable-shared
    libavutil      56. 22.100 / 56. 22.100
    libavcodec     58. 35.100 / 58. 35.100
    libavformat    58. 20.100 / 58. 20.100
    libavdevice     58.  5.100 / 58.  5.100
    libavfilter     7. 40.101 /  7. 40.101
    libavresample   4.  0.  0 /  4.  0.  0
    libswscale       5.  3.100 /  5.  3.100
    libswresample   3.  3.100 /  3.  3.100
    libpostproc     55.  3.100 / 55.  3.100
Input #0, image2, from 'tmp/file%02d.png':
  Duration: 00:00:05.00, start: 0.000000, bitrate: N/A
    Stream #0:0: Video: png, rgba(pc), 1296x432 [SAR 2835:2835 DAR 3:1], 2 fps, 2 tbr, 2 tbn, 2 tbc
  Stream mapping:
    Stream #0:0 -> #0:0 (png (native) -> h264 (libx264))
Press [q] to stop, [?] for help
[libx264 @ 0x55d138756f00] using SAR=1/1
[libx264 @ 0x55d138756f00] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2 AVX FMA3 BMI2 AVX2
[libx264 @ 0x55d138756f00] profile High, level 3.1
[libx264 @ 0x55d138756f00] 264 - core 155 r2917 0a84d98 - H.264/MPEG-4 AVC codec - Copyleft 2003-2018 - http://www.videolan.org/x264.html - options: cabac=1 ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00:0.00 mix_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast_pskip=1 chroma_qp_offset=-2 threads=3 lookahead_threads=1 sliced_threads=0 nr=0 decimate=1 interlaced=0 bluray_compat=0 constrained_intra=0 bframes=3 b_pyramid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 keyint_min=25 scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=2.3.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ratio=1.40 aq=1:1.00
Output #0, mp4, to '/home/jupyter/videos/runs/cameraman/experiments/1.0_1.0_1.0_1.0/siren_uniformlr_1e-06_video.mp4':
  Metadata:
    encoder : Lavf58.20.100
    Stream #0:0: Video: h264 (libx264) (avc1 / 0x31637661), yuv420p, 1296x432 [SAR 1:1 DAR 3:1], q=-1--1, 30 fps, 15360 tbn, 30 tbc
  Metadata:
```

```

encoder      : Lavc58.35.100 libx264
Side data:
  cpb: bitrate max/min/avg: 0/0/0 buffer size: 0 vbv_delay: -1
frame= 150 fps=101 q=-1.0 Lsize=      234kB time=00:00:04.90 bitrate= 390.9kbit/s dup=140 drop=0 speed=3.29x
video:231kB audio:0kB subtitle:0kB other streams:0kB global headers:0kB muxing overhead: 1.120074%
[libx264 @ 0x55d138756f00] frame I:1      Avg QP:15.68  size: 45795
[libx264 @ 0x55d138756f00] frame P:38     Avg QP:19.33  size: 4765
[libx264 @ 0x55d138756f00] frame B:111    Avg QP:14.76  size:     83
[libx264 @ 0x55d138756f00] consecutive B-frames: 1.3% 0.0% 0.0% 98.7%
[libx264 @ 0x55d138756f00] mb I  I16..4: 58.6% 17.0% 24.4%
[libx264 @ 0x55d138756f00] mb P  I16..4:  0.4%  1.9%  0.7%  P16..4:  3.9%  1.4% 1.4% 0.0% 0.0% skip:90.4%
[libx264 @ 0x55d138756f00] mb B  I16..4:  0.1%  0.0%  0.0%  B16..8:  2.9%  0.0% 0.0% direct: 0.0% skip:97.0% L0:46.3% L1:53.6% BI: 0.1%
[libx264 @ 0x55d138756f00] 8x8 transform intra:41.0% inter:65.7%
[libx264 @ 0x55d138756f00] coded y,uvDC,uvAC intra: 55.3% 58.9% 56.8% inter: 1.0% 1.3% 0.9%
[libx264 @ 0x55d138756f00] i16 v,h,dc,p: 74% 18% 8% 1%
[libx264 @ 0x55d138756f00] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 15% 16% 15% 6% 10% 9% 10% 11%
[libx264 @ 0x55d138756f00] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 27% 27% 16% 4% 6% 6% 4% 4%
[libx264 @ 0x55d138756f00] i8c dc,h,v,p: 52% 21% 19% 7%
[libx264 @ 0x55d138756f00] Weighted P-Frames: Y:0.0% UV:0.0%
[libx264 @ 0x55d138756f00] ref P L0: 72.6% 19.2% 7.2% 0.9%
[libx264 @ 0x55d138756f00] ref B L0: 71.8% 27.5% 0.7%
[libx264 @ 0x55d138756f00] ref B L1: 97.4% 2.6%
[libx264 @ 0x55d138756f00] kb/s:377.73

```

-----Generating Data-----

100%|██████████| 10/10 [00:00<00:00, 1028.02it/s]

-----Finished-----

-----Begin Training-----

10it [00:28, 2.84s/it]

Epoch 1, Epoch loss: total 17970.644727, pixel 0.322667, grad 7.913178, laplacian 37.945254, dIdt 17924.463672

Epoch 1, Epoch SSIM: pixel -0.069106, grad 0.043346, laplacian 0.000080, dIdt 0.004930

10it [00:28, 2.88s/it]

Epoch 2, Epoch loss: total 17970.356836, pixel 0.322661, grad 7.912936, laplacian 37.942976, dIdt 17924.178027

Epoch 2, Epoch SSIM: pixel -0.069102, grad 0.043341, laplacian 0.000080, dIdt 0.004933

10it [00:28, 2.88s/it]

Epoch 3, Epoch loss: total 17970.184863, pixel 0.322653, grad 7.912725, laplacian 37.940608, dIdt 17924.008594

Epoch 3, Epoch SSIM: pixel -0.069114, grad 0.043338, laplacian 0.000080, dIdt 0.004936

10it [00:28, 2.88s/it]

Epoch 4, Epoch loss: total 17970.023926, pixel 0.322646, grad 7.912520, laplacian 37.938979, dIdt 17923.849805

Epoch 4, Epoch SSIM: pixel -0.069128, grad 0.043335, laplacian 0.000081, dIdt 0.004938

10it [00:28, 2.90s/it]

```
Epoch 5, Epoch loss: total 17969.866211, pixel 0.322639, grad 7.912319, laplacian 37.938211, dIdt 17923.693066
Epoch 5, Epoch SSIM: pixel -0.069142, grad 0.043332, laplacian 0.000081, dIdt 0.004940
10it [00:29, 2.91s/it]
Epoch 6, Epoch loss: total 17969.710449, pixel 0.322631, grad 7.912122, laplacian 37.938340, dIdt 17923.537500
Epoch 6, Epoch SSIM: pixel -0.069156, grad 0.043328, laplacian 0.000080, dIdt 0.004941
10it [00:28, 2.89s/it]
Epoch 7, Epoch loss: total 17969.554883, pixel 0.322624, grad 7.911928, laplacian 37.939388, dIdt 17923.380957
Epoch 7, Epoch SSIM: pixel -0.069171, grad 0.043324, laplacian 0.000077, dIdt 0.004942
10it [00:28, 2.88s/it]
Epoch 8, Epoch loss: total 17969.400684, pixel 0.322618, grad 7.911737, laplacian 37.941357, dIdt 17923.224805
Epoch 8, Epoch SSIM: pixel -0.069185, grad 0.043320, laplacian 0.000077, dIdt 0.004941
10it [00:28, 2.88s/it]
Epoch 9, Epoch loss: total 17969.246875, pixel 0.322611, grad 7.911550, laplacian 37.944250, dIdt 17923.068359
Epoch 9, Epoch SSIM: pixel -0.069199, grad 0.043315, laplacian 0.000078, dIdt 0.004939
10it [00:32, 3.23s/it]
Epoch 10, Epoch loss: total 17969.094629, pixel 0.322604, grad 7.911366, laplacian 37.948072, dIdt 17922.912598
Epoch 10, Epoch SSIM: pixel -0.069212, grad 0.043310, laplacian 0.000077, dIdt 0.004937
10it [00:28, 2.89s/it]
Epoch 11, Epoch loss: total 17968.942773, pixel 0.322598, grad 7.911186, laplacian 37.952827, dIdt 17922.756152
Epoch 11, Epoch SSIM: pixel -0.069226, grad 0.043304, laplacian 0.000074, dIdt 0.004933
10it [00:28, 2.88s/it]
Epoch 12, Epoch loss: total 17968.790918, pixel 0.322592, grad 7.911008, laplacian 37.958511, dIdt 17922.598926
Epoch 12, Epoch SSIM: pixel -0.069239, grad 0.043298, laplacian 0.000072, dIdt 0.004930
10it [00:28, 2.88s/it]
Epoch 13, Epoch loss: total 17968.641113, pixel 0.322585, grad 7.910835, laplacian 37.965131, dIdt 17922.442480
Epoch 13, Epoch SSIM: pixel -0.069252, grad 0.043292, laplacian 0.000070, dIdt 0.004927
10it [00:28, 2.87s/it]
Epoch 14, Epoch loss: total 17968.491211, pixel 0.322579, grad 7.910664, laplacian 37.972685, dIdt 17922.285156
Epoch 14, Epoch SSIM: pixel -0.069265, grad 0.043285, laplacian 0.000070, dIdt 0.004924
10it [00:28, 2.89s/it]
Epoch 15, Epoch loss: total 17968.341992, pixel 0.322574, grad 7.910497, laplacian 37.981173, dIdt 17922.127637
Epoch 15, Epoch SSIM: pixel -0.069277, grad 0.043278, laplacian 0.000070, dIdt 0.004921
10it [00:28, 2.87s/it]
```

```
Epoch 16, Epoch loss: total 17968.194336, pixel 0.322568, grad 7.910334, lapla
cian 37.990597, dIdt 17921.971191
Epoch 16, Epoch SSIM: pixel -0.069290, grad 0.043270, laplacian 0.000069, dIdt
0.004918
10it [00:28, 2.87s/it]
Epoch 17, Epoch loss: total 17968.047070, pixel 0.322562, grad 7.910173, lapla
cian 38.000960, dIdt 17921.813477
Epoch 17, Epoch SSIM: pixel -0.069302, grad 0.043261, laplacian 0.000068, dIdt
0.004915
10it [00:28, 2.90s/it]
Epoch 18, Epoch loss: total 17967.901074, pixel 0.322557, grad 7.910017, lapla
cian 38.012263, dIdt 17921.656445
Epoch 18, Epoch SSIM: pixel -0.069313, grad 0.043252, laplacian 0.000069, dIdt
0.004912
10it [00:28, 2.88s/it]
Epoch 19, Epoch loss: total 17967.756055, pixel 0.322552, grad 7.909863, lapla
cian 38.024506, dIdt 17921.499121
Epoch 19, Epoch SSIM: pixel -0.069325, grad 0.043243, laplacian 0.000068, dIdt
0.004909
10it [00:32, 3.22s/it]
Epoch 20, Epoch loss: total 17967.610840, pixel 0.322547, grad 7.909713, lapla
cian 38.037693, dIdt 17921.340820
Epoch 20, Epoch SSIM: pixel -0.069336, grad 0.043234, laplacian 0.000067, dIdt
0.004906
10it [00:28, 2.90s/it]
Epoch 21, Epoch loss: total 17967.467676, pixel 0.322542, grad 7.909567, lapla
cian 38.051825, dIdt 17921.183789
Epoch 21, Epoch SSIM: pixel -0.069347, grad 0.043224, laplacian 0.000068, dIdt
0.004904
10it [00:29, 2.90s/it]
Epoch 22, Epoch loss: total 17967.323828, pixel 0.322537, grad 7.909424, lapla
cian 38.066902, dIdt 17921.024902
Epoch 22, Epoch SSIM: pixel -0.069357, grad 0.043214, laplacian 0.000067, dIdt
0.004901
10it [00:28, 2.88s/it]
Epoch 23, Epoch loss: total 17967.181250, pixel 0.322533, grad 7.909284, lapla
cian 38.082927, dIdt 17920.866602
Epoch 23, Epoch SSIM: pixel -0.069368, grad 0.043203, laplacian 0.000065, dIdt
0.004899
10it [00:28, 2.87s/it]
Epoch 24, Epoch loss: total 17967.040039, pixel 0.322528, grad 7.909148, lapla
cian 38.099900, dIdt 17920.708398
Epoch 24, Epoch SSIM: pixel -0.069378, grad 0.043193, laplacian 0.000065, dIdt
0.004896
10it [00:28, 2.88s/it]
Epoch 25, Epoch loss: total 17966.899609, pixel 0.322524, grad 7.909015, lapla
cian 38.117825, dIdt 17920.550195
Epoch 25, Epoch SSIM: pixel -0.069387, grad 0.043181, laplacian 0.000065, dIdt
0.004892
10it [00:28, 2.90s/it]
Epoch 26, Epoch loss: total 17966.759570, pixel 0.322520, grad 7.908885, lapla
cian 38.136700, dIdt 17920.391602
Epoch 26, Epoch SSIM: pixel -0.069397, grad 0.043170, laplacian 0.000066, dIdt
0.004887
10it [00:28, 2.87s/it]
```

```
Epoch 27, Epoch loss: total 17966.621094, pixel 0.322516, grad 7.908759, lapla
cian 38.156531, dIdt 17920.233105
Epoch 27, Epoch SSIM: pixel -0.069406, grad 0.043158, laplacian 0.000065, dIdt
0.004881
10it [00:28, 2.88s/it]
Epoch 28, Epoch loss: total 17966.482129, pixel 0.322512, grad 7.908637, lapla
cian 38.177318, dIdt 17920.073828
Epoch 28, Epoch SSIM: pixel -0.069414, grad 0.043145, laplacian 0.000065, dIdt
0.004871
10it [00:28, 2.83s/it]
Epoch 29, Epoch loss: total 17966.345410, pixel 0.322508, grad 7.908517, lapla
cian 38.199062, dIdt 17919.915332
Epoch 29, Epoch SSIM: pixel -0.069423, grad 0.043131, laplacian 0.000065, dIdt
0.004860
10it [00:31, 3.18s/it]
Epoch 30, Epoch loss: total 17966.208594, pixel 0.322505, grad 7.908402, lapla
cian 38.221769, dIdt 17919.755762
Epoch 30, Epoch SSIM: pixel -0.069431, grad 0.043117, laplacian 0.000062, dIdt
0.004848
10it [00:28, 2.85s/it]
Epoch 31, Epoch loss: total 17966.072656, pixel 0.322501, grad 7.908289, lapla
cian 38.245435, dIdt 17919.596484
Epoch 31, Epoch SSIM: pixel -0.069439, grad 0.043103, laplacian 0.000062, dIdt
0.004835
10it [00:28, 2.85s/it]
Epoch 32, Epoch loss: total 17965.937500, pixel 0.322498, grad 7.908180, lapla
cian 38.270067, dIdt 17919.436621
Epoch 32, Epoch SSIM: pixel -0.069446, grad 0.043088, laplacian 0.000064, dIdt
0.004821
10it [00:28, 2.86s/it]
Epoch 33, Epoch loss: total 17965.803223, pixel 0.322495, grad 7.908075, lapla
cian 38.295664, dIdt 17919.277246
Epoch 33, Epoch SSIM: pixel -0.069453, grad 0.043072, laplacian 0.000065, dIdt
0.004808
10it [00:28, 2.86s/it]
Epoch 34, Epoch loss: total 17965.670117, pixel 0.322492, grad 7.907973, lapla
cian 38.322230, dIdt 17919.117676
Epoch 34, Epoch SSIM: pixel -0.069460, grad 0.043056, laplacian 0.000063, dIdt
0.004794
10it [00:28, 2.84s/it]
Epoch 35, Epoch loss: total 17965.537109, pixel 0.322489, grad 7.907874, lapla
cian 38.349767, dIdt 17918.956934
Epoch 35, Epoch SSIM: pixel -0.069466, grad 0.043040, laplacian 0.000064, dIdt
0.004780
10it [00:28, 2.84s/it]
Epoch 36, Epoch loss: total 17965.405078, pixel 0.322486, grad 7.907779, lapla
cian 38.378277, dIdt 17918.796680
Epoch 36, Epoch SSIM: pixel -0.069472, grad 0.043023, laplacian 0.000064, dIdt
0.004767
10it [00:28, 2.83s/it]
Epoch 37, Epoch loss: total 17965.273926, pixel 0.322483, grad 7.907687, lapla
cian 38.407764, dIdt 17918.636328
Epoch 37, Epoch SSIM: pixel -0.069478, grad 0.043005, laplacian 0.000062, dIdt
0.004753
10it [00:28, 2.83s/it]
```

```
Epoch 38, Epoch loss: total 17965.143652, pixel 0.322481, grad 7.907599, lapla
cian 38.438230, dIdt 17918.475098
Epoch 38, Epoch SSIM: pixel -0.069483, grad 0.042987, laplacian 0.000061, dIdt
0.004740
10it [00:28, 2.82s/it]
Epoch 39, Epoch loss: total 17965.013672, pixel 0.322479, grad 7.907514, lapla
cian 38.469678, dIdt 17918.314160
Epoch 39, Epoch SSIM: pixel -0.069488, grad 0.042968, laplacian 0.000062, dIdt
0.004728
10it [00:31, 3.20s/it]
Epoch 40, Epoch loss: total 17964.885547, pixel 0.322476, grad 7.907433, lapla
cian 38.502110, dIdt 17918.153320
Epoch 40, Epoch SSIM: pixel -0.069492, grad 0.042949, laplacian 0.000061, dIdt
0.004716
10it [00:28, 2.82s/it]
Epoch 41, Epoch loss: total 17964.757031, pixel 0.322474, grad 7.907355, lapla
cian 38.535530, dIdt 17917.991699
Epoch 41, Epoch SSIM: pixel -0.069496, grad 0.042929, laplacian 0.000061, dIdt
0.004704
10it [00:28, 2.82s/it]
Epoch 42, Epoch loss: total 17964.629395, pixel 0.322472, grad 7.907280, lapla
cian 38.569938, dIdt 17917.829492
Epoch 42, Epoch SSIM: pixel -0.069500, grad 0.042909, laplacian 0.000060, dIdt
0.004694
10it [00:28, 2.83s/it]
Epoch 43, Epoch loss: total 17964.502930, pixel 0.322471, grad 7.907209, lapla
cian 38.605340, dIdt 17917.668262
Epoch 43, Epoch SSIM: pixel -0.069503, grad 0.042888, laplacian 0.000060, dIdt
0.004684
10it [00:28, 2.83s/it]
Epoch 44, Epoch loss: total 17964.377930, pixel 0.322469, grad 7.907142, lapla
cian 38.641739, dIdt 17917.506348
Epoch 44, Epoch SSIM: pixel -0.069506, grad 0.042866, laplacian 0.000059, dIdt
0.004676
10it [00:28, 2.82s/it]
Epoch 45, Epoch loss: total 17964.252441, pixel 0.322467, grad 7.907078, lapla
cian 38.679137, dIdt 17917.343848
Epoch 45, Epoch SSIM: pixel -0.069509, grad 0.042845, laplacian 0.000059, dIdt
0.004669
10it [00:28, 2.83s/it]
Epoch 46, Epoch loss: total 17964.127930, pixel 0.322466, grad 7.907017, lapla
cian 38.717536, dIdt 17917.180859
Epoch 46, Epoch SSIM: pixel -0.069511, grad 0.042822, laplacian 0.000060, dIdt
0.004664
10it [00:28, 2.83s/it]
Epoch 47, Epoch loss: total 17964.004883, pixel 0.322465, grad 7.906960, lapla
cian 38.756942, dIdt 17917.018359
Epoch 47, Epoch SSIM: pixel -0.069512, grad 0.042799, laplacian 0.000060, dIdt
0.004661
10it [00:28, 2.83s/it]
Epoch 48, Epoch loss: total 17963.881055, pixel 0.322464, grad 7.906907, lapla
cian 38.797357, dIdt 17916.854590
Epoch 48, Epoch SSIM: pixel -0.069514, grad 0.042775, laplacian 0.000062, dIdt
0.004658
10it [00:28, 2.85s/it]
```

```
Epoch 49, Epoch loss: total 17963.759375, pixel 0.322463, grad 7.906857, lapla  
cian 38.838785, dIdt 17916.691309  
Epoch 49, Epoch SSIM: pixel -0.069514, grad 0.042751, laplacian 0.000062, dIdt  
0.004656  
10it [00:31, 3.16s/it]  
Epoch 50, Epoch loss: total 17963.638379, pixel 0.322462, grad 7.906811, lapla  
cian 38.881227, dIdt 17916.527832  
Epoch 50, Epoch SSIM: pixel -0.069515, grad 0.042726, laplacian 0.000061, dIdt  
0.004655  
10it [00:28, 2.84s/it]  
Epoch 51, Epoch loss: total 17963.517676, pixel 0.322461, grad 7.906768, lapla  
cian 38.924691, dIdt 17916.363965  
Epoch 51, Epoch SSIM: pixel -0.069515, grad 0.042701, laplacian 0.000061, dIdt  
0.004655  
10it [00:28, 2.84s/it]  
Epoch 52, Epoch loss: total 17963.397559, pixel 0.322460, grad 7.906728, lapla  
cian 38.969178, dIdt 17916.199121  
Epoch 52, Epoch SSIM: pixel -0.069514, grad 0.042674, laplacian 0.000061, dIdt  
0.004656  
10it [00:28, 2.82s/it]  
Epoch 53, Epoch loss: total 17963.278906, pixel 0.322460, grad 7.906693, lapla  
cian 39.014690, dIdt 17916.035156  
Epoch 53, Epoch SSIM: pixel -0.069513, grad 0.042648, laplacian 0.000061, dIdt  
0.004657  
10it [00:28, 2.80s/it]  
Epoch 54, Epoch loss: total 17963.160840, pixel 0.322460, grad 7.906661, lapla  
cian 39.061231, dIdt 17915.870410  
Epoch 54, Epoch SSIM: pixel -0.069512, grad 0.042620, laplacian 0.000061, dIdt  
0.004658  
10it [00:28, 2.82s/it]  
Epoch 55, Epoch loss: total 17963.043359, pixel 0.322459, grad 7.906632, lapla  
cian 39.108809, dIdt 17915.705371  
Epoch 55, Epoch SSIM: pixel -0.069510, grad 0.042592, laplacian 0.000062, dIdt  
0.004658  
10it [00:28, 2.83s/it]  
Epoch 56, Epoch loss: total 17962.926074, pixel 0.322459, grad 7.906607, lapla  
cian 39.157425, dIdt 17915.539648  
Epoch 56, Epoch SSIM: pixel -0.069507, grad 0.042564, laplacian 0.000064, dIdt  
0.004656  
10it [00:28, 2.82s/it]  
Epoch 57, Epoch loss: total 17962.809961, pixel 0.322459, grad 7.906586, lapla  
cian 39.207083, dIdt 17915.373926  
Epoch 57, Epoch SSIM: pixel -0.069504, grad 0.042535, laplacian 0.000064, dIdt  
0.004651  
10it [00:27, 2.80s/it]  
Epoch 58, Epoch loss: total 17962.694629, pixel 0.322459, grad 7.906568, lapla  
cian 39.257789, dIdt 17915.207813  
Epoch 58, Epoch SSIM: pixel -0.069501, grad 0.042505, laplacian 0.000065, dIdt  
0.004645  
10it [00:28, 2.83s/it]  
Epoch 59, Epoch loss: total 17962.579980, pixel 0.322460, grad 7.906553, lapla  
cian 39.309545, dIdt 17915.041504  
Epoch 59, Epoch SSIM: pixel -0.069497, grad 0.042475, laplacian 0.000064, dIdt  
0.004636  
10it [00:31, 3.14s/it]
```

```
Epoch 60, Epoch loss: total 17962.465918, pixel 0.322460, grad 7.906543, lapla  
cian 39.362354, dIdt 17914.874609  
Epoch 60, Epoch SSIM: pixel -0.069492, grad 0.042443, laplacian 0.000065, dIdt  
0.004626  
10it [00:28, 2.82s/it]  
Epoch 61, Epoch loss: total 17962.353125, pixel 0.322461, grad 7.906536, lapla  
cian 39.416224, dIdt 17914.707813  
Epoch 61, Epoch SSIM: pixel -0.069487, grad 0.042411, laplacian 0.000064, dIdt  
0.004616  
10it [00:28, 2.85s/it]  
Epoch 62, Epoch loss: total 17962.240527, pixel 0.322461, grad 7.906533, lapla  
cian 39.471157, dIdt 17914.540332  
Epoch 62, Epoch SSIM: pixel -0.069482, grad 0.042379, laplacian 0.000062, dIdt  
0.004605  
10it [00:28, 2.82s/it]  
Epoch 63, Epoch loss: total 17962.128418, pixel 0.322462, grad 7.906534, lapla  
cian 39.527157, dIdt 17914.372070  
Epoch 63, Epoch SSIM: pixel -0.069476, grad 0.042345, laplacian 0.000061, dIdt  
0.004595  
10it [00:28, 2.81s/it]  
Epoch 64, Epoch loss: total 17962.017969, pixel 0.322463, grad 7.906538, lapla  
cian 39.584230, dIdt 17914.204492  
Epoch 64, Epoch SSIM: pixel -0.069469, grad 0.042312, laplacian 0.000062, dIdt  
0.004585  
10it [00:28, 2.86s/it]  
Epoch 65, Epoch loss: total 17961.907129, pixel 0.322464, grad 7.906546, lapla  
cian 39.642380, dIdt 17914.035938  
Epoch 65, Epoch SSIM: pixel -0.069462, grad 0.042278, laplacian 0.000066, dIdt  
0.004576  
10it [00:28, 2.84s/it]  
Epoch 66, Epoch loss: total 17961.798145, pixel 0.322465, grad 7.906557, lapla  
cian 39.701612, dIdt 17913.867480  
Epoch 66, Epoch SSIM: pixel -0.069454, grad 0.042243, laplacian 0.000068, dIdt  
0.004569  
10it [00:28, 2.83s/it]  
Epoch 67, Epoch loss: total 17961.689160, pixel 0.322467, grad 7.906573, lapla  
cian 39.761931, dIdt 17913.698145  
Epoch 67, Epoch SSIM: pixel -0.069445, grad 0.042207, laplacian 0.000069, dIdt  
0.004561  
10it [00:28, 2.83s/it]  
Epoch 68, Epoch loss: total 17961.581445, pixel 0.322468, grad 7.906592, lapla  
cian 39.823339, dIdt 17913.528906  
Epoch 68, Epoch SSIM: pixel -0.069436, grad 0.042172, laplacian 0.000068, dIdt  
0.004553  
10it [00:28, 2.83s/it]  
Epoch 69, Epoch loss: total 17961.473242, pixel 0.322469, grad 7.906614, lapla  
cian 39.885844, dIdt 17913.358496  
Epoch 69, Epoch SSIM: pixel -0.069426, grad 0.042135, laplacian 0.000068, dIdt  
0.004544  
10it [00:31, 3.17s/it]  
Epoch 70, Epoch loss: total 17961.366992, pixel 0.322471, grad 7.906641, lapla  
cian 39.949447, dIdt 17913.188574  
Epoch 70, Epoch SSIM: pixel -0.069416, grad 0.042098, laplacian 0.000067, dIdt  
0.004535  
10it [00:28, 2.86s/it]
```

```
Epoch 71, Epoch loss: total 17961.261230, pixel 0.322473, grad 7.906672, lapla  
cian 40.014159, dIdt 17913.017773  
Epoch 71, Epoch SSIM: pixel -0.069405, grad 0.042061, laplacian 0.000067, dIdt  
0.004523  
10it [00:28, 2.84s/it]  
Epoch 72, Epoch loss: total 17961.156152, pixel 0.322475, grad 7.906706, lapla  
cian 40.079985, dIdt 17912.846973  
Epoch 72, Epoch SSIM: pixel -0.069393, grad 0.042023, laplacian 0.000068, dIdt  
0.004510  
10it [00:28, 2.84s/it]  
Epoch 73, Epoch loss: total 17961.051660, pixel 0.322477, grad 7.906744, lapla  
cian 40.146923, dIdt 17912.675293  
Epoch 73, Epoch SSIM: pixel -0.069381, grad 0.041984, laplacian 0.000068, dIdt  
0.004493  
10it [00:28, 2.86s/it]  
Epoch 74, Epoch loss: total 17960.947656, pixel 0.322479, grad 7.906786, lapla  
cian 40.214985, dIdt 17912.503516  
Epoch 74, Epoch SSIM: pixel -0.069368, grad 0.041945, laplacian 0.000067, dIdt  
0.004475  
10it [00:28, 2.82s/it]  
Epoch 75, Epoch loss: total 17960.845117, pixel 0.322481, grad 7.906832, lapla  
cian 40.284174, dIdt 17912.331641  
Epoch 75, Epoch SSIM: pixel -0.069354, grad 0.041906, laplacian 0.000067, dIdt  
0.004454  
10it [00:28, 2.84s/it]  
Epoch 76, Epoch loss: total 17960.742871, pixel 0.322484, grad 7.906882, lapla  
cian 40.354496, dIdt 17912.158887  
Epoch 76, Epoch SSIM: pixel -0.069339, grad 0.041867, laplacian 0.000065, dIdt  
0.004433  
10it [00:28, 2.85s/it]  
Epoch 77, Epoch loss: total 17960.641211, pixel 0.322486, grad 7.906935, lapla  
cian 40.425956, dIdt 17911.985645  
Epoch 77, Epoch SSIM: pixel -0.069324, grad 0.041827, laplacian 0.000066, dIdt  
0.004411  
10it [00:28, 2.83s/it]  
Epoch 78, Epoch loss: total 17960.540723, pixel 0.322489, grad 7.906993, lapla  
cian 40.498559, dIdt 17911.812500  
Epoch 78, Epoch SSIM: pixel -0.069308, grad 0.041787, laplacian 0.000065, dIdt  
0.004390  
10it [00:28, 2.81s/it]  
Epoch 79, Epoch loss: total 17960.440527, pixel 0.322492, grad 7.907054, lapla  
cian 40.572313, dIdt 17911.638672  
Epoch 79, Epoch SSIM: pixel -0.069291, grad 0.041746, laplacian 0.000064, dIdt  
0.004371  
10it [00:31, 3.15s/it]  
Epoch 80, Epoch loss: total 17960.340820, pixel 0.322494, grad 7.907120, lapla  
cian 40.647221, dIdt 17911.464160  
Epoch 80, Epoch SSIM: pixel -0.069274, grad 0.041706, laplacian 0.000064, dIdt  
0.004353  
-----Finished-----  
-----Generating Data-----  
100%|██████████| 10/10 [00:00<00:00, 1237.48it/s]  
-----Finished-----
```

```

10it [00:19,  1.91s/it]
ffmpeg version 4.1.9-0+deb10u1 Copyright (c) 2000-2022 the FFmpeg developers
  built with gcc 8 (Debian 8.3.0-6)
  configuration: --prefix=/usr --extra-version=0+deb10u1 --toolchain=hardened
  --libdir=/usr/lib/x86_64-linux-gnu --incdir=/usr/include/x86_64-linux-gnu --arch
  amd64 --enable-gpl --disable-stripping --enable-avresample --disable-filter
  =resample --enable-avisynth --enable-gnutls --enable-ladspa --enable-libaom --
  enable-libass --enable-libbluray --enable-libbs2b --enable-libcaca --enable-li
  bcdio --enable-libcodec2 --enable-libflite --enable-libfontconfig --enable-lib
  freetype --enable-libfribidi --enable-libgme --enable-libgsm --enable-libjack
  --enable-libmp3lame --enable-libmysofa --enable-libopenjpeg --enable-libopenmp
  t --enable-libopus --enable-libpulse --enable-librsvg --enable-librubberband -
  --enable-libshine --enable-libsnappy --enable-libsoxr --enable-libspeex --enabl
  e-libssh --enable-libtheora --enable-libtwolame --enable-libvidstab --enable-l
  ibvorbis --enable-libvpx --enable-libwavpack --enable-libwebp --enable-libx265
  --enable-libxml2 --enable-libxvid --enable-libzmq --enable-libzvbi --enable-lv
  2 --enable-omx --enable-openal --enable-opengl --enable-sdl2 --enable-libdc139
  4 --enable-libdrm --enable-libiec61883 --enable-chromaprint --enable-frei0r --
  enable-libx264 --enable-shared
    libavutil      56. 22.100 / 56. 22.100
    libavcodec     58. 35.100 / 58. 35.100
    libavformat    58. 20.100 / 58. 20.100
    libavdevice     58.  5.100 / 58.  5.100
    libavfilter     7. 40.101 /  7. 40.101
    libavresample   4.  0.  0 /  4.  0.  0
    libswscale      5.  3.100 /  5.  3.100
    libswresample   3.  3.100 /  3.  3.100
    libpostproc    55.  3.100 / 55.  3.100
Input #0, image2, from 'tmp/file%02d.png':
  Duration: 00:00:05.00, start: 0.000000, bitrate: N/A
    Stream #0:0: Video: png, rgba(pc), 1296x432 [SAR 2835:2835 DAR 3:1], 2 fp
  s, 2 tbr, 2 tbn, 2 tbc
  Stream mapping:
    Stream #0:0 -> #0:0 (png (native) -> h264 (libx264))
Press [q] to stop, [?] for help
[libx264 @ 0x55da9695af00] using SAR=1/1
[libx264 @ 0x55da9695af00] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2
AVX FMA3 BMI2 AVX2
[libx264 @ 0x55da9695af00] profile High, level 3.1
[libx264 @ 0x55da9695af00] 264 - core 155 r2917 0a84d98 - H.264/MPEG-4 AVC cod
ec - Copyleft 2003-2018 - http://www.videolan.org/x264.html - options: cabac=1
ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00:0.00 mi
xed_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast
_pskip=1 chroma_qp_offset=-2 threads=3 lookahead_threads=1 sliced_threads=0 nr
=0 decimate=1 interlaced=0 bluray_compat=0 constrained_intra=0 bframes=3 b_pyr
amid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 k
eyint_min=25 scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=2
3.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ratio=1.40 aq=1:1.00
Output #0, mp4, to '/home/jupyter/videos/runs/cameraman/experiments/1.0_1.0_1.
0_1.0/siren_uniformlr_1e-07_video.mp4':
  Metadata:
    encoder : Lavf58.20.100
  Stream #0:0: Video: h264 (libx264) (avc1 / 0x31637661), yuv420p, 1296x432
  [SAR 1:1 DAR 3:1], q=-1--1, 30 fps, 15360 tbn, 30 tbc
  Metadata:
    encoder : Lavc58.35.100 libx264
  Side data:
    cpb: bitrate max/min/avg: 0/0/0 buffer size: 0 vbv_delay: -1
    frame= 150 fps=105 q=-1.0 Lsize=      269kB time=00:00:04.90 bitrate= 450.2kbi
    ts/s dup=140 drop=0 speed=3.42x

```

```
video:267kB audio:0kB subtitle:0kB other streams:0kB global headers:0kB muxing overhead: 0.971123%
[libx264 @ 0x55da9695af00] frame I:1      Avg QP:15.81  size: 51337
[libx264 @ 0x55da9695af00] frame P:38     Avg QP:19.34  size: 5561
[libx264 @ 0x55da9695af00] frame B:111    Avg QP:14.77  size:     88
[libx264 @ 0x55da9695af00] consecutive B-frames: 1.3% 0.0% 0.0% 98.7%
[libx264 @ 0x55da9695af00] mb I  I16..4: 58.4% 16.0% 25.5%
[libx264 @ 0x55da9695af00] mb P  I16..4:  0.3%  1.7%  0.7%  P16..4:  3.8%  1.
5% 1.5% 0.0% 0.0%  skip:90.4%
[libx264 @ 0x55da9695af00] mb B  I16..4:  0.1%  0.0%  0.0%  B16..8:  3.1%  0.
0% 0.0% direct: 0.0% skip:96.8% L0:47.2% L1:52.7% BI: 0.1%
[libx264 @ 0x55da9695af00] 8x8 transform intra:38.9% inter:65.5%
[libx264 @ 0x55da9695af00] coded y,uvDC,uvAC intra: 56.4% 58.4% 56.0% inter:
1.0% 1.4% 0.9%
[libx264 @ 0x55da9695af00] i16 v,h,dc,p: 74% 18% 8% 0%
[libx264 @ 0x55da9695af00] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 14% 13% 15% 5% 12%
10% 11% 9% 10%
[libx264 @ 0x55da9695af00] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 26% 24% 15% 5% 7%
7% 7% 5% 5%
[libx264 @ 0x55da9695af00] i8c dc,h,v,p: 56% 20% 17% 7%
[libx264 @ 0x55da9695af00] Weighted P-Frames: Y:0.0% UV:0.0%
[libx264 @ 0x55da9695af00] ref P L0: 71.1% 20.1% 7.9% 1.0%
[libx264 @ 0x55da9695af00] ref B L0: 69.0% 30.3% 0.6%
[libx264 @ 0x55da9695af00] ref B L1: 97.5% 2.5%
[libx264 @ 0x55da9695af00] kb/s:435.84
```

-----Generating Data-----

100%|██████████| 10/10 [00:00<00:00, 1123.63it/s]

-----Finished-----

-----Begin Training-----

10it [00:27, 2.76s/it]

Epoch 1, Epoch loss: total 18042.472656, pixel 0.344299, grad 8.091451, laplacian 71.070844, dIdt 17962.966309

Epoch 1, Epoch SSIM: pixel 0.144824, grad 0.032728, laplacian 0.000021, dIdt 0.002271

10it [00:28, 2.82s/it]

Epoch 2, Epoch loss: total 18036.862500, pixel 0.323812, grad 7.965486, laplacian 55.413557, dIdt 17973.159863

Epoch 2, Epoch SSIM: pixel 0.063796, grad 0.036406, laplacian 0.000048, dIdt 0.004809

10it [00:28, 2.83s/it]

Epoch 3, Epoch loss: total 17958.381836, pixel 0.321535, grad 7.900297, laplacian 46.134036, dIdt 17904.026172

Epoch 3, Epoch SSIM: pixel 0.155309, grad 0.040881, laplacian 0.000062, dIdt 0.004554

10it [00:28, 2.82s/it]

Epoch 4, Epoch loss: total 17950.074023, pixel 0.322438, grad 7.925628, laplacian 53.981807, dIdt 17887.843945

Epoch 4, Epoch SSIM: pixel 0.168707, grad 0.036910, laplacian 0.000040, dIdt 0.003742

10it [00:28, 2.82s/it]

Epoch 5, Epoch loss: total 17947.535840, pixel 0.323238, grad 7.940610, laplacian 58.087276, dIdt 17881.185059

Epoch 5, Epoch SSIM: pixel 0.173598, grad 0.035486, laplacian 0.000038, dIdt 0.003494

10it [00:28, 2.81s/it]

```
Epoch 6, Epoch loss: total 17946.677246, pixel 0.323604, grad 7.946863, laplacian 59.772319, dIdt 17878.634375
Epoch 6, Epoch SSIM: pixel 0.175469, grad 0.034962, laplacian 0.000035, dIdt 0.003427
10it [00:28, 2.81s/it]
Epoch 7, Epoch loss: total 17946.384863, pixel 0.323745, grad 7.949206, laplacian 60.403222, dIdt 17877.708496
Epoch 7, Epoch SSIM: pixel 0.176155, grad 0.034775, laplacian 0.000035, dIdt 0.003403
10it [00:28, 2.82s/it]
Epoch 8, Epoch loss: total 17946.283984, pixel 0.323796, grad 7.950047, laplacian 60.629986, dIdt 17877.379980
Epoch 8, Epoch SSIM: pixel 0.176400, grad 0.034710, laplacian 0.000037, dIdt 0.003394
10it [00:28, 2.84s/it]
Epoch 9, Epoch loss: total 17946.249023, pixel 0.323814, grad 7.950343, laplacian 60.710064, dIdt 17877.264844
Epoch 9, Epoch SSIM: pixel 0.176486, grad 0.034687, laplacian 0.000037, dIdt 0.003391
10it [00:31, 3.15s/it]
Epoch 10, Epoch loss: total 17946.236914, pixel 0.323820, grad 7.950447, laplacian 60.738139, dIdt 17877.224512
Epoch 10, Epoch SSIM: pixel 0.176516, grad 0.034679, laplacian 0.000037, dIdt 0.003390
10it [00:28, 2.82s/it]
Epoch 11, Epoch loss: total 17946.233203, pixel 0.323822, grad 7.950483, laplacian 60.747947, dIdt 17877.210938
Epoch 11, Epoch SSIM: pixel 0.176526, grad 0.034676, laplacian 0.000037, dIdt 0.003389
10it [00:28, 2.83s/it]
Epoch 12, Epoch loss: total 17946.231348, pixel 0.323823, grad 7.950496, laplacian 60.751368, dIdt 17877.205762
Epoch 12, Epoch SSIM: pixel 0.176530, grad 0.034675, laplacian 0.000037, dIdt 0.003389
10it [00:28, 2.84s/it]
Epoch 13, Epoch loss: total 17946.230664, pixel 0.323823, grad 7.950500, laplacian 60.752526, dIdt 17877.203809
Epoch 13, Epoch SSIM: pixel 0.176531, grad 0.034675, laplacian 0.000037, dIdt 0.003389
10it [00:28, 2.82s/it]
Epoch 14, Epoch loss: total 17946.231055, pixel 0.323823, grad 7.950501, laplacian 60.752794, dIdt 17877.203809
Epoch 14, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt 0.003389
10it [00:28, 2.82s/it]
Epoch 15, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950501, laplacian 60.752828, dIdt 17877.203613
Epoch 15, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt 0.003389
10it [00:28, 2.84s/it]
Epoch 16, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950501, laplacian 60.752834, dIdt 17877.203613
Epoch 16, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt 0.003389
10it [00:28, 2.82s/it]
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```
Epoch 17, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 17, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.84s/it]
Epoch 18, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950501, lapla
cian 60.752834, dIdt 17877.203613
Epoch 18, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.82s/it]
Epoch 19, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 19, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:31, 3.15s/it]
Epoch 20, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 20, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.82s/it]
Epoch 21, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 21, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.86s/it]
Epoch 22, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 22, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.83s/it]
Epoch 23, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 23, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.83s/it]
Epoch 24, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 24, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.85s/it]
Epoch 25, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 25, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.83s/it]
Epoch 26, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 26, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.83s/it]
Epoch 27, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 27, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.85s/it]
```

```
Epoch 28, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 28, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.84s/it]
Epoch 29, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 29, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:31, 3.17s/it]
Epoch 30, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 30, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.83s/it]
Epoch 31, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 31, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.84s/it]
Epoch 32, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 32, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.84s/it]
Epoch 33, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 33, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.84s/it]
Epoch 34, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 34, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.86s/it]
Epoch 35, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 35, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.83s/it]
Epoch 36, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 36, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.87s/it]
Epoch 37, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 37, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.88s/it]
Epoch 38, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 38, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.87s/it]
```

```
Epoch 39, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 39, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:32, 3.20s/it]
Epoch 40, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 40, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.88s/it]
Epoch 41, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 41, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.87s/it]
Epoch 42, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 42, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.88s/it]
Epoch 43, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 43, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.89s/it]
Epoch 44, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 44, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.87s/it]
Epoch 45, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 45, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.84s/it]
Epoch 46, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 46, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.84s/it]
Epoch 47, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 47, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.84s/it]
Epoch 48, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 48, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.85s/it]
Epoch 49, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 49, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:31, 3.17s/it]
```

```
Epoch 50, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 50, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.86s/it]
Epoch 51, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 51, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.84s/it]
Epoch 52, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 52, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.83s/it]
Epoch 53, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 53, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.84s/it]
Epoch 54, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 54, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.83s/it]
Epoch 55, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 55, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.88s/it]
Epoch 56, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 56, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.83s/it]
Epoch 57, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 57, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.83s/it]
Epoch 58, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 58, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.82s/it]
Epoch 59, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 59, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:31, 3.19s/it]
Epoch 60, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 60, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.82s/it]
```

```
Epoch 61, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 61, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.83s/it]
Epoch 62, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 62, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.82s/it]
Epoch 63, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 63, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.85s/it]
Epoch 64, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 64, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.82s/it]
Epoch 65, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 65, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.85s/it]
Epoch 66, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 66, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.81s/it]
Epoch 67, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 67, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.83s/it]
Epoch 68, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 68, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.84s/it]
Epoch 69, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 69, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:31, 3.16s/it]
Epoch 70, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 70, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.82s/it]
Epoch 71, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla
cian 60.752834, dIdt 17877.203613
Epoch 71, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt
0.003389
10it [00:28, 2.82s/it]
```

```
Epoch 72, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla  
cian 60.752834, dIdt 17877.203613  
Epoch 72, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt  
0.003389  
10it [00:28, 2.84s/it]  
Epoch 73, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla  
cian 60.752834, dIdt 17877.203613  
Epoch 73, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt  
0.003389  
10it [00:28, 2.82s/it]  
Epoch 74, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla  
cian 60.752834, dIdt 17877.203613  
Epoch 74, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt  
0.003389  
10it [00:28, 2.82s/it]  
Epoch 75, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla  
cian 60.752834, dIdt 17877.203613  
Epoch 75, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt  
0.003389  
10it [00:28, 2.82s/it]  
Epoch 76, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla  
cian 60.752834, dIdt 17877.203613  
Epoch 76, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt  
0.003389  
10it [00:28, 2.82s/it]  
Epoch 77, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla  
cian 60.752834, dIdt 17877.203613  
Epoch 77, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt  
0.003389  
10it [00:28, 2.82s/it]  
Epoch 78, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla  
cian 60.752834, dIdt 17877.203613  
Epoch 78, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt  
0.003389  
10it [00:28, 2.83s/it]  
Epoch 79, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla  
cian 60.752834, dIdt 17877.203613  
Epoch 79, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt  
0.003389  
10it [00:31, 3.15s/it]  
Epoch 80, Epoch loss: total 17946.230859, pixel 0.323823, grad 7.950502, lapla  
cian 60.752834, dIdt 17877.203613  
Epoch 80, Epoch SSIM: pixel 0.176531, grad 0.034674, laplacian 0.000037, dIdt  
0.003389  
-----Finished-----  
-----Generating Data-----  
100%|██████████| 10/10 [00:00<00:00, 1345.75it/s]  
-----Finished-----
```

```

10it [00:18,  1.88s/it]
ffmpeg version 4.1.9-0+deb10u1 Copyright (c) 2000-2022 the FFmpeg developers
  built with gcc 8 (Debian 8.3.0-6)
  configuration: --prefix=/usr --extra-version=0+deb10u1 --toolchain=hardened
  --libdir=/usr/lib/x86_64-linux-gnu --incdir=/usr/include/x86_64-linux-gnu --arch=amd64 --enable-gpl --disable-stripping --enable-avresample --disable-filter=resample --enable-avisynth --enable-gnutls --enable-ladspa --enable-libaom --enable-libass --enable-libbluray --enable-libbs2b --enable-libcaca --enable-libcdio --enable-libcodec2 --enable-libflite --enable-libfontconfig --enable-libfreetype --enable-libfribidi --enable-libgme --enable-libgsm --enable-libjack --enable-libmp3lame --enable-libmysofa --enable-libopenjpeg --enable-libopenmp3 --enable-libopus --enable-libpulse --enable-librsvg --enable-librubberband --enable-libshine --enable-libsنappy --enable-libsoxr --enable-libspeex --enable-libssh --enable-libtheora --enable-libtwolame --enable-libvidstab --enable-libvorbis --enable-libvpx --enable-libwavpack --enable-libwebp --enable-libx265 --enable-libxml2 --enable-libxvid --enable-libzmq --enable-libzvbi --enable-lv2 --enable-omx --enable-openal --enable-opengl --enable-sdl2 --enable-libdc1394 --enable-libdrm --enable-libiec61883 --enable-chromaprint --enable-frei0r --enable-libx264 --enable-shared

  libavutil      56. 22.100 / 56. 22.100
  libavcodec     58. 35.100 / 58. 35.100
  libavformat    58. 20.100 / 58. 20.100
  libavdevice     58.  5.100 / 58.  5.100
  libavfilter     7. 40.101 /  7. 40.101
  libavresample   4.  0.  0 /  4.  0.  0
  libswscale      5.  3.100 /  5.  3.100
  libswresample   3.  3.100 /  3.  3.100
  libpostproc    55.  3.100 / 55.  3.100

Input #0, image2, from 'tmp/file%02d.png':
  Duration: 00:00:05.00, start: 0.000000, bitrate: N/A
    Stream #0:0: Video: png, rgba(pc), 1296x432 [SAR 2835:2835 DAR 3:1], 2 fps, 2 tbr, 2 tbn, 2 tbc
    Stream mapping:
      Stream #0:0 -> #0:0 (png (native) -> h264 (libx264))
Press [q] to stop, [?] for help
[libx264 @ 0x558edfb95f00] using SAR=1/1
[libx264 @ 0x558edfb95f00] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2 AVX FMA3 BMI2 AVX2
[libx264 @ 0x558edfb95f00] profile High, level 3.1
[libx264 @ 0x558edfb95f00] 264 - core 155 r2917 0a84d98 - H.264/MPEG-4 AVC codec - Copyleft 2003-2018 - http://www.videolan.org/x264.html - options: cabac=1 ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00:0.00 mixed_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast_pskip=1 chroma_qp_offset=-2 threads=3 lookahead_threads=1 sliced_threads=0 nr=0 decimate=1 interlaced=0 bluray_compat=0 constrained_intra=0 bframes=3 b_pyramid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 keyint_min=25 scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=2.3.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ratio=1.40 aq=1:1.00
Output #0, mp4, to '/home/jupyter/videos/runs/cameraman/experiments/1.0_1.0_1.0_1.0/siren_decay_exp_le-04_video.mp4':
  Metadata:
    encoder : Lavf58.20.100
  Stream #0:0: Video: h264 (libx264) (avc1 / 0x31637661), yuv420p, 1296x432 [SAR 1:1 DAR 3:1], q=-1--1, 30 fps, 15360 tbn, 30 tbc
  Metadata:
    encoder : Lavc58.35.100 libx264
  Side data:
    cpb: bitrate max/min/avg: 0/0/0 buffer size: 0 vbv_delay: -1
    frame= 150 fps= 84 q=-1.0 Lsize=      257kB time=00:00:04.90 bitrate= 429.9kbit/s dup=140 drop=0 speed=2.74x

```

```
video:255kB audio:0kB subtitle:0kB other streams:0kB global headers:0kB muxing overhead: 1.017367%
[libx264 @ 0x558edfb95f00] frame I:1      Avg QP:15.72  size: 48617
[libx264 @ 0x558edfb95f00] frame P:38     Avg QP:19.36  size:  5313
[libx264 @ 0x558edfb95f00] frame B:111    Avg QP:14.80  size:     85
[libx264 @ 0x558edfb95f00] consecutive B-frames: 1.3% 0.0% 0.0% 98.7%
[libx264 @ 0x558edfb95f00] mb I  I16..4: 58.5% 16.4% 25.1%
[libx264 @ 0x558edfb95f00] mb P  I16..4:  0.3%  1.8%  0.6%  P16..4:  3.9%  1.
4% 1.5% 0.0% 0.0%  skip:90.4%
[libx264 @ 0x558edfb95f00] mb B  I16..4:  0.1%  0.0%  0.0%  B16..8:  3.0%  0.
0% 0.0% direct: 0.0% skip:96.9% L0:46.9% L1:53.0% BI: 0.1%
[libx264 @ 0x558edfb95f00] 8x8 transform intra:40.0% inter:66.2%
[libx264 @ 0x558edfb95f00] coded y,uvDC,uvAC intra: 56.4% 58.7% 56.2% inter:
1.0% 1.4% 0.9%
[libx264 @ 0x558edfb95f00] i16 v,h,dc,p: 75% 16% 8% 0%
[libx264 @ 0x558edfb95f00] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 14% 14% 14% 5% 12%
12% 10% 9% 10%
[libx264 @ 0x558edfb95f00] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 27% 24% 15% 4% 7%
7% 6% 5% 5%
[libx264 @ 0x558edfb95f00] i8c dc,h,v,p: 56% 20% 17% 7%
[libx264 @ 0x558edfb95f00] Weighted P-Frames: Y:0.0% UV:0.0%
[libx264 @ 0x558edfb95f00] ref P L0: 72.2% 19.4% 7.5% 0.8%
[libx264 @ 0x558edfb95f00] ref B L0: 70.1% 29.2% 0.7%
[libx264 @ 0x558edfb95f00] ref B L1: 97.5% 2.5%
[libx264 @ 0x558edfb95f00] kb/s:415.97
```

-----Generating Data-----

100%|██████████| 10/10 [00:00<00:00, 1161.60it/s]

-----Finished-----

-----Begin Training-----

10it [00:27, 2.78s/it]

Epoch 1, Epoch loss: total 17972.187891, pixel 0.319601, grad 7.936548, laplacian 39.684502, dIdt 17924.247266

Epoch 1, Epoch SSIM: pixel -0.003415, grad 0.042596, laplacian 0.000030, dIdt 0.005194

10it [00:28, 2.84s/it]

Epoch 2, Epoch loss: total 17969.428516, pixel 0.320070, grad 7.940710, laplacian 40.445758, dIdt 17920.722070

Epoch 2, Epoch SSIM: pixel 0.007183, grad 0.042377, laplacian 0.000038, dIdt 0.004684

10it [00:28, 2.85s/it]

Epoch 3, Epoch loss: total 17964.102734, pixel 0.321279, grad 7.956008, laplacian 44.378442, dIdt 17911.446973

Epoch 3, Epoch SSIM: pixel 0.023318, grad 0.040377, laplacian 0.000054, dIdt 0.004430

10it [00:28, 2.88s/it]

Epoch 4, Epoch loss: total 17962.023926, pixel 0.325185, grad 8.009720, laplacian 58.164511, dIdt 17895.524707

Epoch 4, Epoch SSIM: pixel 0.044885, grad 0.034887, laplacian 0.000048, dIdt 0.003306

10it [00:28, 2.85s/it]

Epoch 5, Epoch loss: total 17976.271289, pixel 0.339667, grad 8.189344, laplacian 99.943295, dIdt 17867.798730

Epoch 5, Epoch SSIM: pixel 0.068566, grad 0.025295, laplacian 0.000020, dIdt 0.001508

10it [00:28, 2.83s/it]

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Epoch 6, Epoch loss: total 18049.906836, pixel 0.396186, grad 8.774462, laplacian 221.800201, dIdt 17818.935937
Epoch 6, Epoch SSIM: pixel 0.081152, grad 0.016921, laplacian 0.000014, dIdt 0.000444
10it [00:28, 2.84s/it]
Epoch 7, Epoch loss: total 18242.105664, pixel 0.561903, grad 10.026477, laplacian 469.831754, dIdt 17761.685352
Epoch 7, Epoch SSIM: pixel 0.094277, grad 0.012286, laplacian 0.000008, dIdt 0.000140
10it [00:28, 2.83s/it]
Epoch 8, Epoch loss: total 18495.395117, pixel 0.807905, grad 11.780150, laplacian 794.403403, dIdt 17688.403418
Epoch 8, Epoch SSIM: pixel 0.108419, grad 0.011536, laplacian 0.000010, dIdt 0.000092
10it [00:28, 2.87s/it]
Epoch 9, Epoch loss: total 18969.762793, pixel 1.024006, grad 14.934597, laplacian 1391.974762, dIdt 17561.829004
Epoch 9, Epoch SSIM: pixel 0.075360, grad 0.012303, laplacian 0.000004, dIdt 0.000068
10it [00:31, 3.20s/it]
Epoch 10, Epoch loss: total 18917.980957, pixel 1.607216, grad 13.910558, laplacian 1346.434041, dIdt 17556.029199
Epoch 10, Epoch SSIM: pixel 0.090960, grad 0.015076, laplacian 0.000008, dIdt 0.000391
10it [00:28, 2.82s/it]
Epoch 11, Epoch loss: total 19965.796680, pixel 0.850816, grad 19.247720, laplacian 2361.132861, dIdt 17584.565332
Epoch 11, Epoch SSIM: pixel 0.022587, grad 0.007590, laplacian 0.000003, dIdt 0.000086
10it [00:28, 2.84s/it]
Epoch 12, Epoch loss: total 20313.083105, pixel 2.048339, grad 19.362521, laplacian 2736.655728, dIdt 17555.016406
Epoch 12, Epoch SSIM: pixel 0.080319, grad 0.014732, laplacian 0.000001, dIdt 0.000277
10it [00:28, 2.88s/it]
Epoch 13, Epoch loss: total 20230.100586, pixel 1.642215, grad 21.264338, laplacian 2752.911841, dIdt 17454.282031
Epoch 13, Epoch SSIM: pixel 0.041193, grad 0.010160, laplacian 0.000000, dIdt 0.000063
10it [00:28, 2.83s/it]
Epoch 14, Epoch loss: total 21279.979687, pixel 2.338125, grad 23.739422, laplacian 3651.574335, dIdt 17602.327832
Epoch 14, Epoch SSIM: pixel 0.056988, grad 0.011034, laplacian 0.000002, dIdt 0.000144
10it [00:28, 2.84s/it]
Epoch 15, Epoch loss: total 21423.878906, pixel 2.638983, grad 22.980067, laplacian 3861.448267, dIdt 17536.812012
Epoch 15, Epoch SSIM: pixel 0.054191, grad 0.012756, laplacian 0.000001, dIdt 0.000153
10it [00:28, 2.82s/it]
Epoch 16, Epoch loss: total 20897.866895, pixel 3.491402, grad 23.457058, laplacian 3460.802698, dIdt 17410.115625
Epoch 16, Epoch SSIM: pixel 0.042099, grad 0.011447, laplacian 0.000001, dIdt 0.000211
10it [00:28, 2.82s/it]
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Epoch 17, Epoch loss: total 22286.673047, pixel 4.035925, grad 32.467342, laplacian 5043.214331, dIdt 17206.955859
Epoch 17, Epoch SSIM: pixel 0.041826, grad 0.010071, laplacian 0.000000, dIdt 0.000239
10it [00:28, 2.82s/it]
Epoch 18, Epoch loss: total 20856.361133, pixel 3.735779, grad 22.126008, laplacian 3554.420905, dIdt 17276.078320
Epoch 18, Epoch SSIM: pixel 0.047580, grad 0.010472, laplacian 0.000001, dIdt 0.000306
10it [00:28, 2.81s/it]
Epoch 19, Epoch loss: total 22175.843359, pixel 4.533228, grad 29.579898, laplacian 4897.612061, dIdt 17244.118164
Epoch 19, Epoch SSIM: pixel 0.037712, grad 0.007751, laplacian 0.000001, dIdt 0.000120
10it [00:31, 3.15s/it]
Epoch 20, Epoch loss: total 26710.923828, pixel 4.781392, grad 43.193946, laplacian 9481.608020, dIdt 17181.340332
Epoch 20, Epoch SSIM: pixel 0.050794, grad 0.006380, laplacian 0.000001, dIdt 0.000367
10it [00:28, 2.82s/it]
Epoch 21, Epoch loss: total 23344.379297, pixel 5.696470, grad 24.593125, laplacian 5963.939722, dIdt 17350.150195
Epoch 21, Epoch SSIM: pixel 0.030673, grad 0.008753, laplacian 0.000000, dIdt 0.000206
10it [00:28, 2.84s/it]
Epoch 22, Epoch loss: total 28954.008398, pixel 1.939942, grad 37.238503, laplacian 11360.328662, dIdt 17554.501367
Epoch 22, Epoch SSIM: pixel 0.062713, grad 0.004976, laplacian 0.000000, dIdt 0.000340
10it [00:28, 2.85s/it]
Epoch 23, Epoch loss: total 30244.871875, pixel 3.371113, grad 34.193378, laplacian 12906.265137, dIdt 17301.042090
Epoch 23, Epoch SSIM: pixel 0.043392, grad 0.005586, laplacian 0.000000, dIdt 0.000193
10it [00:28, 2.81s/it]
Epoch 24, Epoch loss: total 40888.845508, pixel 4.401516, grad 55.540704, laplacian 23633.202441, dIdt 17195.700977
Epoch 24, Epoch SSIM: pixel 0.025427, grad 0.003181, laplacian 0.000000, dIdt 0.000264
10it [00:28, 2.83s/it]
Epoch 25, Epoch loss: total 74507.742578, pixel 2.989390, grad 87.311780, laplacian 56592.010547, dIdt 17825.431934
Epoch 25, Epoch SSIM: pixel 0.035610, grad 0.004231, laplacian 0.000000, dIdt 0.000424
10it [00:28, 2.87s/it]
Epoch 26, Epoch loss: total 56281.001563, pixel 2.172763, grad 41.944111, laplacian 37926.589648, dIdt 18310.294238
Epoch 26, Epoch SSIM: pixel 0.048311, grad 0.005198, laplacian 0.000000, dIdt 0.000019
10it [00:28, 2.82s/it]
Epoch 27, Epoch loss: total 71924.915625, pixel 1.686509, grad 48.301595, laplacian 53733.995313, dIdt 18140.932129
Epoch 27, Epoch SSIM: pixel 0.047395, grad 0.006693, laplacian 0.000000, dIdt 0.000115
10it [00:28, 2.81s/it]
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Epoch 28, Epoch loss: total 73641.864453, pixel 1.811783, grad 47.164428, laplacian 56065.536328, dIdt 17527.352930
Epoch 28, Epoch SSIM: pixel 0.043188, grad 0.005974, laplacian 0.000000, dIdt 0.000035
10it [00:28, 2.81s/it]
Epoch 29, Epoch loss: total 77584.037109, pixel 1.970488, grad 49.351570, laplacian 60289.443750, dIdt 17243.271582
Epoch 29, Epoch SSIM: pixel 0.044564, grad 0.004407, laplacian 0.000000, dIdt 0.000142
10it [00:31, 3.15s/it]
Epoch 30, Epoch loss: total 87877.471875, pixel 2.633357, grad 49.518471, laplacian 70873.770312, dIdt 16951.549902
Epoch 30, Epoch SSIM: pixel 0.041708, grad 0.005434, laplacian 0.000000, dIdt 0.000416
10it [00:28, 2.82s/it]
Epoch 31, Epoch loss: total 124230.842188, pixel 3.046040, grad 75.975291, laplacian 107357.942187, dIdt 16793.877246
Epoch 31, Epoch SSIM: pixel 0.035062, grad 0.003456, laplacian 0.000000, dIdt 0.000574
10it [00:28, 2.81s/it]
Epoch 32, Epoch loss: total 134935.172656, pixel 4.054019, grad 73.095794, laplacian 118431.431250, dIdt 16426.592383
Epoch 32, Epoch SSIM: pixel 0.031022, grad 0.004369, laplacian -0.000000, dIdt 0.000879
10it [00:28, 2.82s/it]
Epoch 33, Epoch loss: total 165305.425781, pixel 4.222109, grad 88.964537, laplacian 149041.285156, dIdt 16170.954785
Epoch 33, Epoch SSIM: pixel 0.028976, grad 0.003515, laplacian 0.000000, dIdt 0.001142
10it [00:28, 2.85s/it]
Epoch 34, Epoch loss: total 204561.721875, pixel 5.358037, grad 104.810023, laplacian 188592.710156, dIdt 15858.841211
Epoch 34, Epoch SSIM: pixel 0.023075, grad 0.001526, laplacian 0.000000, dIdt 0.001776
10it [00:28, 2.83s/it]
Epoch 35, Epoch loss: total 269321.720313, pixel 5.207396, grad 134.015163, laplacian 253718.850000, dIdt 15463.646680
Epoch 35, Epoch SSIM: pixel 0.022259, grad 0.003227, laplacian 0.000000, dIdt 0.002433
10it [00:28, 2.84s/it]
Epoch 36, Epoch loss: total 300431.706250, pixel 6.604788, grad 138.917331, laplacian 285358.214062, dIdt 14927.976562
Epoch 36, Epoch SSIM: pixel 0.019644, grad 0.002530, laplacian 0.000000, dIdt 0.003372
10it [00:28, 2.82s/it]
Epoch 37, Epoch loss: total 450878.671875, pixel 5.769735, grad 199.847655, laplacian 436684.868750, dIdt 13988.178809
Epoch 37, Epoch SSIM: pixel 0.020790, grad 0.002273, laplacian 0.000000, dIdt 0.004863
10it [00:28, 2.88s/it]
Epoch 38, Epoch loss: total 485797.796875, pixel 7.767707, grad 200.665251, laplacian 472539.918750, dIdt 13049.438965
Epoch 38, Epoch SSIM: pixel 0.015446, grad 0.001743, laplacian 0.000000, dIdt 0.007555
10it [00:28, 2.84s/it]
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Epoch 39, Epoch loss: total 702689.959375, pixel 6.038279, grad 294.665723, la  
placian 689821.381250, dIdt 12567.876465  
Epoch 39, Epoch SSIM: pixel 0.019614, grad 0.002453, laplacian -0.000000, dIdt  
0.009170  
10it [00:31, 3.17s/it]  
Epoch 40, Epoch loss: total 649849.953125, pixel 7.915736, grad 253.256656, la  
placian 637975.528125, dIdt 11613.252539  
Epoch 40, Epoch SSIM: pixel 0.014446, grad 0.001778, laplacian 0.000000, dIdt  
0.013264  
10it [00:28, 2.82s/it]  
Epoch 41, Epoch loss: total 736027.118750, pixel 6.844706, grad 278.166273, la  
placian 724670.687500, dIdt 11071.424219  
Epoch 41, Epoch SSIM: pixel 0.016081, grad 0.002393, laplacian 0.000000, dIdt  
0.016646  
10it [00:28, 2.82s/it]  
Epoch 42, Epoch loss: total 667639.050000, pixel 6.982189, grad 230.284854, la  
placian 657076.606250, dIdt 10325.187891  
Epoch 42, Epoch SSIM: pixel 0.017275, grad 0.002503, laplacian 0.000000, dIdt  
0.021347  
10it [00:28, 2.84s/it]  
Epoch 43, Epoch loss: total 604369.125000, pixel 6.999739, grad 186.391618, la  
placian 594223.150000, dIdt 9952.581445  
Epoch 43, Epoch SSIM: pixel 0.015349, grad 0.002579, laplacian 0.000000, dIdt  
0.025580  
10it [00:28, 2.82s/it]  
Epoch 44, Epoch loss: total 560482.587500, pixel 6.904125, grad 155.427202, la  
placian 550588.640625, dIdt 9731.609180  
Epoch 44, Epoch SSIM: pixel 0.016039, grad 0.003058, laplacian 0.000000, dIdt  
0.029335  
10it [00:28, 2.82s/it]  
Epoch 45, Epoch loss: total 532869.575000, pixel 6.943536, grad 136.797549, la  
placian 523120.400000, dIdt 9605.445312  
Epoch 45, Epoch SSIM: pixel 0.017105, grad 0.003348, laplacian 0.000000, dIdt  
0.032526  
10it [00:28, 2.82s/it]  
Epoch 46, Epoch loss: total 516075.978125, pixel 6.994643, grad 125.406149, la  
placian 506417.484375, dIdt 9526.084473  
Epoch 46, Epoch SSIM: pixel 0.017119, grad 0.003723, laplacian 0.000000, dIdt  
0.035081  
10it [00:28, 2.84s/it]  
Epoch 47, Epoch loss: total 506383.262500, pixel 7.018709, grad 118.579573, la  
placian 496785.625000, dIdt 9472.047168  
Epoch 47, Epoch SSIM: pixel 0.017115, grad 0.004078, laplacian 0.000000, dIdt  
0.037116  
10it [00:28, 2.85s/it]  
Epoch 48, Epoch loss: total 500519.334375, pixel 7.032679, grad 114.301405, la  
placian 490962.740625, dIdt 9435.252734  
Epoch 48, Epoch SSIM: pixel 0.017190, grad 0.004246, laplacian 0.000000, dIdt  
0.038644  
10it [00:28, 2.81s/it]  
Epoch 49, Epoch loss: total 496850.193750, pixel 7.041209, grad 111.618613, la  
placian 487319.656250, dIdt 9411.878809  
Epoch 49, Epoch SSIM: pixel 0.017226, grad 0.004329, laplacian 0.000000, dIdt  
0.039670  
10it [00:31, 3.16s/it]
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Epoch 50, Epoch loss: total 494714.478125, pixel 7.045170, grad 110.183486, la  
placian 485197.296875, dIdt 9399.957861  
Epoch 50, Epoch SSIM: pixel 0.017234, grad 0.004385, laplacian 0.000000, dIdt  
0.040208  
10it [00:28, 2.83s/it]  
Epoch 51, Epoch loss: total 494051.053125, pixel 7.047024, grad 109.740957, la  
placian 484537.803125, dIdt 9396.464209  
Epoch 51, Epoch SSIM: pixel 0.017222, grad 0.004407, laplacian 0.000000, dIdt  
0.040370  
10it [00:28, 2.82s/it]  
Epoch 52, Epoch loss: total 493897.493750, pixel 7.050746, grad 109.008333, la  
placian 484394.721875, dIdt 9386.708496  
Epoch 52, Epoch SSIM: pixel 0.017208, grad 0.004401, laplacian 0.000000, dIdt  
0.040829  
10it [00:28, 2.82s/it]  
Epoch 53, Epoch loss: total 492933.240625, pixel 7.056966, grad 107.329774, la  
placian 483452.212500, dIdt 9366.628271  
Epoch 53, Epoch SSIM: pixel 0.017199, grad 0.004424, laplacian 0.000000, dIdt  
0.041790  
10it [00:28, 2.82s/it]  
Epoch 54, Epoch loss: total 491606.831250, pixel 7.064544, grad 104.861787, la  
placian 482158.137500, dIdt 9336.773633  
Epoch 54, Epoch SSIM: pixel 0.017212, grad 0.004471, laplacian 0.000000, dIdt  
0.043267  
10it [00:28, 2.82s/it]  
Epoch 55, Epoch loss: total 490575.156250, pixel 7.073091, grad 101.807948, la  
placian 481168.140625, dIdt 9298.125195  
Epoch 55, Epoch SSIM: pixel 0.017238, grad 0.004530, laplacian 0.000000, dIdt  
0.045261  
10it [00:28, 2.82s/it]  
Epoch 56, Epoch loss: total 490615.421875, pixel 7.081600, grad 98.411475, la  
placian 481257.971875, dIdt 9251.957422  
Epoch 56, Epoch SSIM: pixel 0.017279, grad 0.004602, laplacian 0.000000, dIdt  
0.047786  
10it [00:28, 2.82s/it]  
Epoch 57, Epoch loss: total 492478.575000, pixel 7.088745, grad 94.894378, la  
placian 483176.934375, dIdt 9199.655762  
Epoch 57, Epoch SSIM: pixel 0.017347, grad 0.004721, laplacian 0.000000, dIdt  
0.050811  
10it [00:28, 2.81s/it]  
Epoch 58, Epoch loss: total 496740.240625, pixel 7.090921, grad 91.509695, la  
placian 487499.081250, dIdt 9142.553223  
Epoch 58, Epoch SSIM: pixel 0.017480, grad 0.004855, laplacian 0.000000, dIdt  
0.054314  
10it [00:28, 2.83s/it]  
Epoch 59, Epoch loss: total 506425.037500, pixel 7.094279, grad 88.659969, la  
placian 497240.540625, dIdt 9088.750635  
Epoch 59, Epoch SSIM: pixel 0.017446, grad 0.005442, laplacian 0.000000, dIdt  
0.058084  
10it [00:31, 3.18s/it]  
Epoch 60, Epoch loss: total 540655.418750, pixel 7.045194, grad 100.776279, la  
placian 531481.356250, dIdt 9066.239551  
Epoch 60, Epoch SSIM: pixel 0.017856, grad 0.004937, laplacian 0.000000, dIdt  
0.061437  
10it [00:28, 2.84s/it]
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Epoch 61, Epoch loss: total 591849.950000, pixel 6.947707, grad 110.730942, la  
placian 582624.928125, dIdt 9107.335938  
Epoch 61, Epoch SSIM: pixel 0.017229, grad 0.008918, laplacian 0.000000, dIdt  
0.063325  
10it [00:28, 2.83s/it]  
Epoch 62, Epoch loss: total 844882.387500, pixel 6.522120, grad 236.839201, la  
placian 834975.590625, dIdt 9663.437793  
Epoch 62, Epoch SSIM: pixel 0.022949, grad 0.006718, laplacian 0.000000, dIdt  
0.054216  
10it [00:28, 2.82s/it]  
Epoch 63, Epoch loss: total 1219380.762500, pixel 4.731289, grad 400.310416, la  
placian 1207826.825000, dIdt 11148.902148  
Epoch 63, Epoch SSIM: pixel 0.018032, grad 0.006478, laplacian 0.000000, dIdt  
0.034390  
10it [00:28, 2.86s/it]  
Epoch 64, Epoch loss: total 1395103.193750, pixel 4.649072, grad 470.628195, la  
placian 1383070.031250, dIdt 11557.868262  
Epoch 64, Epoch SSIM: pixel 0.019153, grad 0.002219, laplacian 0.000000, dIdt  
0.025701  
10it [00:28, 2.81s/it]  
Epoch 65, Epoch loss: total 1344900.731250, pixel 4.503846, grad 432.943857, la  
placian 1332947.050000, dIdt 11516.217090  
Epoch 65, Epoch SSIM: pixel 0.018777, grad 0.002290, laplacian 0.000000, dIdt  
0.024320  
10it [00:28, 2.82s/it]  
Epoch 66, Epoch loss: total 1307594.343750, pixel 5.027319, grad 425.233389, la  
placian 1295492.781250, dIdt 11671.297070  
Epoch 66, Epoch SSIM: pixel 0.020518, grad 0.001952, laplacian -0.000000, dIdt  
0.023717  
10it [00:28, 2.83s/it]  
Epoch 67, Epoch loss: total 1339828.025000, pixel 4.675050, grad 411.330670, la  
placian 1327815.637500, dIdt 11596.409180  
Epoch 67, Epoch SSIM: pixel 0.019357, grad 0.002866, laplacian -0.000000, dIdt  
0.025005  
10it [00:28, 2.82s/it]  
Epoch 68, Epoch loss: total 1347780.212500, pixel 5.803702, grad 418.897290, la  
placian 1335622.550000, dIdt 11732.974609  
Epoch 68, Epoch SSIM: pixel 0.016626, grad 0.001978, laplacian -0.000000, dIdt  
0.025627  
10it [00:28, 2.84s/it]  
Epoch 69, Epoch loss: total 1512482.925000, pixel 4.384089, grad 445.622116, la  
placian 1500235.725000, dIdt 11797.198926  
Epoch 69, Epoch SSIM: pixel 0.020776, grad 0.002081, laplacian 0.000000, dIdt  
0.025053  
10it [00:31, 3.15s/it]  
Epoch 70, Epoch loss: total 1484008.325000, pixel 6.539468, grad 444.324109, la  
placian 1472133.612500, dIdt 11423.835547  
Epoch 70, Epoch SSIM: pixel 0.014343, grad 0.001286, laplacian 0.000000, dIdt  
0.027897  
10it [00:28, 2.83s/it]  
Epoch 71, Epoch loss: total 1667394.375000, pixel 4.254791, grad 490.438928, la  
placian 1655071.637500, dIdt 11828.008301  
Epoch 71, Epoch SSIM: pixel 0.020333, grad 0.002008, laplacian 0.000000, dIdt  
0.025868  
10it [00:28, 2.82s/it]
```

```
Epoch 72, Epoch loss: total 1571239.750000, pixel 6.233161, grad 434.081384, l  
aplacian 1559698.550000, dIdt 11100.879102  
Epoch 72, Epoch SSIM: pixel 0.012048, grad 0.002922, laplacian 0.000000, dIdt  
0.030146  
10it [00:28, 2.89s/it]  
Epoch 73, Epoch loss: total 1719709.575000, pixel 3.889825, grad 490.113699, l  
aplacian 1707821.000000, dIdt 11394.575195  
Epoch 73, Epoch SSIM: pixel 0.023811, grad 0.000856, laplacian 0.000000, dIdt  
0.029110  
10it [00:28, 2.81s/it]  
Epoch 74, Epoch loss: total 1649173.937500, pixel 5.894309, grad 425.072351, l  
aplacian 1637894.950000, dIdt 10848.020215  
Epoch 74, Epoch SSIM: pixel 0.008188, grad 0.002742, laplacian 0.000000, dIdt  
0.032891  
10it [00:28, 2.82s/it]  
Epoch 75, Epoch loss: total 1614937.931250, pixel 3.811666, grad 424.035065, l  
aplacian 1603396.062500, dIdt 11114.007324  
Epoch 75, Epoch SSIM: pixel 0.023407, grad 0.001573, laplacian 0.000000, dIdt  
0.033403  
10it [00:28, 2.84s/it]  
Epoch 76, Epoch loss: total 1583917.843750, pixel 5.000916, grad 376.086063, l  
aplacian 1573124.568750, dIdt 10412.186279  
Epoch 76, Epoch SSIM: pixel 0.013010, grad 0.003945, laplacian 0.000000, dIdt  
0.038428  
10it [00:28, 2.85s/it]  
Epoch 77, Epoch loss: total 1560939.337500, pixel 3.846670, grad 385.457396, l  
aplacian 1550200.237500, dIdt 10349.803467  
Epoch 77, Epoch SSIM: pixel 0.025766, grad 0.001021, laplacian 0.000000, dIdt  
0.042061  
10it [00:28, 2.83s/it]  
Epoch 78, Epoch loss: total 1450382.675000, pixel 4.832159, grad 316.836128, l  
aplacian 1440182.343750, dIdt 9878.664551  
Epoch 78, Epoch SSIM: pixel 0.016765, grad 0.004323, laplacian 0.000000, dIdt  
0.049634  
10it [00:28, 2.82s/it]  
Epoch 79, Epoch loss: total 1289433.056250, pixel 3.884988, grad 286.628065, l  
aplacian 1279469.793750, dIdt 9672.771582  
Epoch 79, Epoch SSIM: pixel 0.023240, grad 0.004587, laplacian 0.000000, dIdt  
0.058177  
10it [00:31, 3.16s/it]  
Epoch 80, Epoch loss: total 1096685.593750, pixel 3.827555, grad 201.773943, l  
aplacian 1087291.412500, dIdt 9188.586133  
Epoch 80, Epoch SSIM: pixel 0.024679, grad 0.005774, laplacian 0.000000, dIdt  
0.068980  
-----Finished-----  
-----Generating Data-----  
100%|██████████| 10/10 [00:00<00:00, 1277.39it/s]  
-----Finished-----
```

```

10it [00:19,  1.93s/it]
ffmpeg version 4.1.9-0+deb10u1 Copyright (c) 2000-2022 the FFmpeg developers
  built with gcc 8 (Debian 8.3.0-6)
  configuration: --prefix=/usr --extra-version=0+deb10u1 --toolchain=hardened
  --libdir=/usr/lib/x86_64-linux-gnu --incdir=/usr/include/x86_64-linux-gnu --arch=amd64 --enable-gpl --disable-stripping --enable-avresample --disable-filter=resample --enable-avisynth --enable-gnutls --enable-ladspa --enable-libaom --enable-libass --enable-libbluray --enable-libbs2b --enable-libcaca --enable-libcdio --enable-libcodec2 --enable-libflite --enable-libfontconfig --enable-libfreetype --enable-libfribidi --enable-libgme --enable-libgsm --enable-libjack --enable-libmp3lame --enable-libmysofa --enable-libopenjpeg --enable-libopenmp3 --enable-libopus --enable-libpulse --enable-librsvg --enable-librubberband --enable-libshine --enable-libsنappy --enable-libsoxr --enable-libspeex --enable-libssh --enable-libtheora --enable-libtwolame --enable-libvidstab --enable-libvorbis --enable-libvpx --enable-libwavpack --enable-libwebp --enable-libx265 --enable-libxml2 --enable-libxvid --enable-libzmq --enable-libzvbi --enable-lv2 --enable-omx --enable-openal --enable-opengl --enable-sdl2 --enable-libdc1394 --enable-libdrm --enable-libiec61883 --enable-chromaprint --enable-frei0r --enable-libx264 --enable-shared

  libavutil      56. 22.100 / 56. 22.100
  libavcodec     58. 35.100 / 58. 35.100
  libavformat    58. 20.100 / 58. 20.100
  libavdevice     58.  5.100 / 58.  5.100
  libavfilter     7. 40.101 /  7. 40.101
  libavresample    4.  0.  0 /  4.  0.  0
  libswscale       5.  3.100 /  5.  3.100
  libswresample    3.  3.100 /  3.  3.100
  libpostproc     55.  3.100 / 55.  3.100

Input #0, image2, from 'tmp/file%02d.png':
  Duration: 00:00:05.00, start: 0.000000, bitrate: N/A
    Stream #0:0: Video: png, rgba(pc), 1296x432 [SAR 2835:2835 DAR 3:1], 2 fps, 2 tbr, 2 tbn, 2 tbc
    Stream mapping:
      Stream #0:0 -> #0:0 (png (native) -> h264 (libx264))
    Press [q] to stop, [?] for help
[libx264 @ 0x55e30a3d7f00] using SAR=1/1
[libx264 @ 0x55e30a3d7f00] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2 AVX FMA3 BMI2 AVX2
[libx264 @ 0x55e30a3d7f00] profile High, level 3.1
[libx264 @ 0x55e30a3d7f00] 264 - core 155 r2917 0a84d98 - H.264/MPEG-4 AVC codec - Copyleft 2003-2018 - http://www.videolan.org/x264.html - options: cabac=1 ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00:0.00 mixed_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast_pskip=1 chroma_qp_offset=-2 threads=3 lookahead_threads=1 sliced_threads=0 nr=0 decimate=1 interlaced=0 bluray_compat=0 constrained_intra=0 bframes=3 b_pyramid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 keyint_min=25 scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=2.3.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ratio=1.40 aq=1:1.00
Output #0, mp4, to '/home/jupyter/videos/runs/cameraman/experiments/1.0_1.0_1.0_1.0/siren_cyclic_le-04_le-07_video.mp4':
  Metadata:
    encoder : Lavf58.20.100
  Stream #0:0: Video: h264 (libx264) (avc1 / 0x31637661), yuv420p, 1296x432 [SAR 1:1 DAR 3:1], q=-1--1, 30 fps, 15360 tbn, 30 tbc
  Metadata:
    encoder : Lavc58.35.100 libx264
  Side data:
    cpb: bitrate max/min/avg: 0/0/0 buffer size: 0 vbv_delay: -1
    frame= 150 fps= 82 q=-1.0 Lsize=      313kB time=00:00:04.90 bitrate= 523.1kbit/s dup=140 drop=0 speed=2.68x

```

```
video:310kB audio:0kB subtitle:0kB other streams:0kB global headers:0kB muxing overhead: 0.834537%
[libx264 @ 0x55e30a3d7f00] frame I:1       Avg QP:16.31  size: 56911
[libx264 @ 0x55e30a3d7f00] frame P:38      Avg QP:19.35  size:  6597
[libx264 @ 0x55e30a3d7f00] frame B:111     Avg QP:14.81  size:     86
[libx264 @ 0x55e30a3d7f00] consecutive B-frames: 1.3% 0.0% 0.0% 98.7%
[libx264 @ 0x55e30a3d7f00] mb I  I16..4: 50.2% 25.1% 24.6%
[libx264 @ 0x55e30a3d7f00] mb P  I16..4:  0.5%  2.2%  0.6%  P16..4:  3.9%  1.
2% 1.1% 0.0% 0.0%  skip:90.5%
[libx264 @ 0x55e30a3d7f00] mb B  I16..4:  0.1%  0.0%  0.0%  B16..8:  3.0%  0.
0% 0.0% direct: 0.0% skip:96.9% L0:48.6% L1:51.3% BI: 0.1%
[libx264 @ 0x55e30a3d7f00] 8x8 transform intra:46.8% inter:60.4%
[libx264 @ 0x55e30a3d7f00] coded y,uvDC,uvAC intra: 58.0% 59.8% 57.3% inter:
0.9% 1.2% 0.7%
[libx264 @ 0x55e30a3d7f00] i16 v,h,dc,p: 69% 22%  8%  1%
[libx264 @ 0x55e30a3d7f00] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 16% 12% 21%  7%  9%
9% 8% 11%
[libx264 @ 0x55e30a3d7f00] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 25% 23% 17%  6%  7%
6% 6% 5% 6%
[libx264 @ 0x55e30a3d7f00] i8c dc,h,v,p: 59% 17% 15%  8%
[libx264 @ 0x55e30a3d7f00] Weighted P-Frames: Y:0.0% UV:0.0%
[libx264 @ 0x55e30a3d7f00] ref P L0: 72.2% 20.9% 6.0% 0.8%
[libx264 @ 0x55e30a3d7f00] ref B L0: 67.9% 31.4% 0.7%
[libx264 @ 0x55e30a3d7f00] ref B L1: 97.6% 2.4%
[libx264 @ 0x55e30a3d7f00] kb/s:507.35
```

-----Generating Data-----

100%|██████████| 10/10 [00:00<00:00, 1127.05it/s]

-----Finished-----

-----Begin Training-----

10it [00:27, 2.78s/it]

Epoch 1, Epoch loss: total 18067.080371, pixel 0.365846, grad 8.338543, laplacian 121.202385, dIdt 17937.173535

Epoch 1, Epoch SSIM: pixel 0.036192, grad 0.029396, laplacian 0.000020, dIdt 0.001148

10it [00:28, 2.82s/it]

Epoch 2, Epoch loss: total 18746.434961, pixel 0.407978, grad 9.975387, laplacian 767.275128, dIdt 17968.776172

Epoch 2, Epoch SSIM: pixel 0.031128, grad 0.018874, laplacian 0.000007, dIdt 0.000718

10it [00:28, 2.84s/it]

Epoch 3, Epoch loss: total 19121.100000, pixel 0.355406, grad 9.701250, laplacian 1178.598877, dIdt 17932.444238

Epoch 3, Epoch SSIM: pixel -0.024089, grad 0.017511, laplacian 0.000012, dIdt 0.000415

10it [00:28, 2.82s/it]

Epoch 4, Epoch loss: total 19293.180078, pixel 0.362149, grad 9.958477, laplacian 1367.936432, dIdt 17914.923145

Epoch 4, Epoch SSIM: pixel -0.031694, grad 0.016386, laplacian 0.000005, dIdt 0.000415

10it [00:28, 2.85s/it]

Epoch 5, Epoch loss: total 19392.203125, pixel 0.367206, grad 10.161180, laplacian 1507.697760, dIdt 17873.977246

Epoch 5, Epoch SSIM: pixel -0.029324, grad 0.015367, laplacian 0.000009, dIdt 0.000443

10it [00:28, 2.81s/it]

```
Epoch 6, Epoch loss: total 19402.016992, pixel 0.367876, grad 10.189184, lapla  
cian 1522.246906, dIdt 17869.213086  
Epoch 6, Epoch SSIM: pixel -0.028603, grad 0.015152, laplacian 0.000007, dIdt  
0.000430  
10it [00:28, 2.82s/it]  
Epoch 7, Epoch loss: total 19405.880469, pixel 0.368204, grad 10.202438, lapla  
cian 1530.665613, dIdt 17864.644141  
Epoch 7, Epoch SSIM: pixel -0.028335, grad 0.015062, laplacian 0.000010, dIdt  
0.000428  
10it [00:28, 2.82s/it]  
Epoch 8, Epoch loss: total 19407.398242, pixel 0.368282, grad 10.205794, lapla  
cian 1532.677936, dIdt 17864.146094  
Epoch 8, Epoch SSIM: pixel -0.028270, grad 0.015046, laplacian 0.000010, dIdt  
0.000427  
10it [00:28, 2.84s/it]  
Epoch 9, Epoch loss: total 19409.063477, pixel 0.368364, grad 10.209346, lapla  
cian 1534.836768, dIdt 17863.649219  
Epoch 9, Epoch SSIM: pixel -0.028208, grad 0.015031, laplacian 0.000010, dIdt  
0.000426  
10it [00:31, 3.15s/it]  
Epoch 10, Epoch loss: total 19410.825781, pixel 0.368449, grad 10.213022, lapl  
acian 1537.090924, dIdt 17863.153711  
Epoch 10, Epoch SSIM: pixel -0.028147, grad 0.015017, laplacian 0.000010, dIdt  
0.000425  
10it [00:28, 2.84s/it]  
Epoch 11, Epoch loss: total 19412.667578, pixel 0.368535, grad 10.216798, lapl  
acian 1539.421417, dIdt 17862.660938  
Epoch 11, Epoch SSIM: pixel -0.028087, grad 0.015003, laplacian 0.000011, dIdt  
0.000424  
10it [00:28, 2.82s/it]  
Epoch 12, Epoch loss: total 19414.578320, pixel 0.368623, grad 10.220665, lapl  
acian 1541.819781, dIdt 17862.169336  
Epoch 12, Epoch SSIM: pixel -0.028028, grad 0.014989, laplacian 0.000011, dIdt  
0.000423  
10it [00:28, 2.84s/it]  
Epoch 13, Epoch loss: total 19416.553809, pixel 0.368713, grad 10.224616, lapl  
acian 1544.281793, dIdt 17861.678516  
Epoch 13, Epoch SSIM: pixel -0.027969, grad 0.014975, laplacian 0.000012, dIdt  
0.000422  
10it [00:28, 2.82s/it]  
Epoch 14, Epoch loss: total 19418.592773, pixel 0.368804, grad 10.228651, lapl  
acian 1546.805103, dIdt 17861.190137  
Epoch 14, Epoch SSIM: pixel -0.027911, grad 0.014961, laplacian 0.000011, dIdt  
0.000421  
10it [00:28, 2.81s/it]  
Epoch 15, Epoch loss: total 19420.690918, pixel 0.368896, grad 10.232768, lapl  
acian 1549.387231, dIdt 17860.701953  
Epoch 15, Epoch SSIM: pixel -0.027853, grad 0.014948, laplacian 0.000011, dIdt  
0.000421  
10it [00:28, 2.83s/it]  
Epoch 16, Epoch loss: total 19422.846875, pixel 0.368989, grad 10.236964, lapl  
acian 1552.026556, dIdt 17860.214160  
Epoch 16, Epoch SSIM: pixel -0.027796, grad 0.014935, laplacian 0.000011, dIdt  
0.000420  
10it [00:28, 2.82s/it]
```

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Epoch 17, Epoch loss: total 19425.058301, pixel 0.369085, grad 10.241238, laplacian 1554.721436, dIdt 17859.726855
Epoch 17, Epoch SSIM: pixel -0.027739, grad 0.014921, laplacian 0.000011, dIdt 0.000420
10it [00:28, 2.85s/it]
Epoch 18, Epoch loss: total 19427.325195, pixel 0.369181, grad 10.245589, laplacian 1557.470044, dIdt 17859.240625
Epoch 18, Epoch SSIM: pixel -0.027683, grad 0.014908, laplacian 0.000011, dIdt 0.000420
10it [00:28, 2.87s/it]
Epoch 19, Epoch loss: total 19429.644336, pixel 0.369279, grad 10.250014, laplacian 1560.270502, dIdt 17858.754297
Epoch 19, Epoch SSIM: pixel -0.027627, grad 0.014895, laplacian 0.000010, dIdt 0.000420
10it [00:32, 3.20s/it]
Epoch 20, Epoch loss: total 19432.013379, pixel 0.369378, grad 10.254513, laplacian 1563.121759, dIdt 17858.267773
Epoch 20, Epoch SSIM: pixel -0.027572, grad 0.014881, laplacian 0.000011, dIdt 0.000420
10it [00:28, 2.86s/it]
Epoch 21, Epoch loss: total 19434.432715, pixel 0.369478, grad 10.259083, laplacian 1566.022693, dIdt 17857.781445
Epoch 21, Epoch SSIM: pixel -0.027518, grad 0.014868, laplacian 0.000011, dIdt 0.000420
10it [00:28, 2.87s/it]
Epoch 22, Epoch loss: total 19436.898535, pixel 0.369579, grad 10.263723, laplacian 1568.971118, dIdt 17857.294141
Epoch 22, Epoch SSIM: pixel -0.027464, grad 0.014854, laplacian 0.000011, dIdt 0.000420
10it [00:28, 2.85s/it]
Epoch 23, Epoch loss: total 19439.411719, pixel 0.369682, grad 10.268430, laplacian 1571.966187, dIdt 17856.807129
Epoch 23, Epoch SSIM: pixel -0.027410, grad 0.014840, laplacian 0.000011, dIdt 0.000420
10it [00:28, 2.86s/it]
Epoch 24, Epoch loss: total 19441.968652, pixel 0.369786, grad 10.273203, laplacian 1575.006531, dIdt 17856.319238
Epoch 24, Epoch SSIM: pixel -0.027358, grad 0.014827, laplacian 0.000011, dIdt 0.000420
10it [00:28, 2.86s/it]
Epoch 25, Epoch loss: total 19444.569824, pixel 0.369891, grad 10.278041, laplacian 1578.090796, dIdt 17855.831152
Epoch 25, Epoch SSIM: pixel -0.027305, grad 0.014813, laplacian 0.000011, dIdt 0.000420
10it [00:28, 2.90s/it]
Epoch 26, Epoch loss: total 19447.212598, pixel 0.369997, grad 10.282941, laplacian 1581.217950, dIdt 17855.341895
Epoch 26, Epoch SSIM: pixel -0.027254, grad 0.014799, laplacian 0.000012, dIdt 0.000420
10it [00:28, 2.86s/it]
Epoch 27, Epoch loss: total 19449.896973, pixel 0.370104, grad 10.287903, laplacian 1584.386993, dIdt 17854.851953
Epoch 27, Epoch SSIM: pixel -0.027203, grad 0.014785, laplacian 0.000012, dIdt 0.000420
10it [00:28, 2.87s/it]
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Epoch 28, Epoch loss: total 19452.621191, pixel 0.370213, grad 10.292924, laplacian 1587.596704, dIdt 17854.361523
Epoch 28, Epoch SSIM: pixel -0.027152, grad 0.014771, laplacian 0.000012, dIdt 0.000421
10it [00:28, 2.85s/it]
Epoch 29, Epoch loss: total 19455.383887, pixel 0.370322, grad 10.298003, laplacian 1590.846564, dIdt 17853.869141
Epoch 29, Epoch SSIM: pixel -0.027103, grad 0.014757, laplacian 0.000012, dIdt 0.000421
10it [00:32, 3.25s/it]
Epoch 30, Epoch loss: total 19458.184961, pixel 0.370433, grad 10.303139, laplacian 1594.135126, dIdt 17853.376367
Epoch 30, Epoch SSIM: pixel -0.027053, grad 0.014744, laplacian 0.000012, dIdt 0.000421
10it [00:28, 2.86s/it]
Epoch 31, Epoch loss: total 19461.022852, pixel 0.370544, grad 10.308330, laplacian 1597.461926, dIdt 17852.882324
Epoch 31, Epoch SSIM: pixel -0.027005, grad 0.014730, laplacian 0.000012, dIdt 0.000422
10it [00:28, 2.86s/it]
Epoch 32, Epoch loss: total 19463.898047, pixel 0.370657, grad 10.313575, laplacian 1600.826379, dIdt 17852.387305
Epoch 32, Epoch SSIM: pixel -0.026956, grad 0.014716, laplacian 0.000012, dIdt 0.000422
10it [00:28, 2.88s/it]
Epoch 33, Epoch loss: total 19466.808008, pixel 0.370771, grad 10.318874, laplacian 1604.227850, dIdt 17851.890332
Epoch 33, Epoch SSIM: pixel -0.026909, grad 0.014702, laplacian 0.000012, dIdt 0.000421
10it [00:28, 2.87s/it]
Epoch 34, Epoch loss: total 19469.753613, pixel 0.370885, grad 10.324224, laplacian 1607.665350, dIdt 17851.392969
Epoch 34, Epoch SSIM: pixel -0.026862, grad 0.014688, laplacian 0.000012, dIdt 0.000421
10it [00:28, 2.86s/it]
Epoch 35, Epoch loss: total 19472.732031, pixel 0.371001, grad 10.329625, laplacian 1611.138422, dIdt 17850.893066
Epoch 35, Epoch SSIM: pixel -0.026815, grad 0.014674, laplacian 0.000012, dIdt 0.000420
10it [00:28, 2.84s/it]
Epoch 36, Epoch loss: total 19475.744727, pixel 0.371117, grad 10.335075, laplacian 1614.646594, dIdt 17850.391992
Epoch 36, Epoch SSIM: pixel -0.026769, grad 0.014661, laplacian 0.000011, dIdt 0.000419
10it [00:28, 2.83s/it]
Epoch 37, Epoch loss: total 19478.790625, pixel 0.371234, grad 10.340574, laplacian 1618.189417, dIdt 17849.889551
Epoch 37, Epoch SSIM: pixel -0.026724, grad 0.014647, laplacian 0.000011, dIdt 0.000418
10it [00:28, 2.82s/it]
Epoch 38, Epoch loss: total 19481.868652, pixel 0.371352, grad 10.346121, laplacian 1621.766425, dIdt 17849.384863
Epoch 38, Epoch SSIM: pixel -0.026679, grad 0.014633, laplacian 0.000012, dIdt 0.000418
10it [00:28, 2.83s/it]
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Epoch 39, Epoch loss: total 19484.979883, pixel 0.371471, grad 10.351715, laplacian 1625.376880, dIdt 17848.879688
Epoch 39, Epoch SSIM: pixel -0.026635, grad 0.014619, laplacian 0.000012, dIdt 0.000417
10it [00:31, 3.16s/it]
Epoch 40, Epoch loss: total 19488.121582, pixel 0.371591, grad 10.357354, laplacian 1629.020831, dIdt 17848.371582
Epoch 40, Epoch SSIM: pixel -0.026591, grad 0.014605, laplacian 0.000012, dIdt 0.000416
10it [00:28, 2.82s/it]
Epoch 41, Epoch loss: total 19491.294531, pixel 0.371712, grad 10.363040, laplacian 1632.697681, dIdt 17847.862012
Epoch 41, Epoch SSIM: pixel -0.026548, grad 0.014592, laplacian 0.000011, dIdt 0.000414
10it [00:28, 2.85s/it]
Epoch 42, Epoch loss: total 19494.498242, pixel 0.371834, grad 10.368770, laplacian 1636.407385, dIdt 17847.350488
Epoch 42, Epoch SSIM: pixel -0.026506, grad 0.014578, laplacian 0.000011, dIdt 0.000412
10it [00:28, 2.83s/it]
Epoch 43, Epoch loss: total 19497.733594, pixel 0.371956, grad 10.374545, laplacian 1640.150037, dIdt 17846.836816
Epoch 43, Epoch SSIM: pixel -0.026464, grad 0.014565, laplacian 0.000010, dIdt 0.000411
10it [00:28, 2.83s/it]
Epoch 44, Epoch loss: total 19500.999219, pixel 0.372079, grad 10.380364, laplacian 1643.924701, dIdt 17846.321973
Epoch 44, Epoch SSIM: pixel -0.026422, grad 0.014551, laplacian 0.000009, dIdt 0.000409
10it [00:28, 2.86s/it]
Epoch 45, Epoch loss: total 19504.294434, pixel 0.372203, grad 10.386225, laplacian 1647.731451, dIdt 17845.804297
Epoch 45, Epoch SSIM: pixel -0.026381, grad 0.014537, laplacian 0.000009, dIdt 0.000408
10it [00:28, 2.82s/it]
Epoch 46, Epoch loss: total 19507.620215, pixel 0.372328, grad 10.392129, laplacian 1651.570355, dIdt 17845.285352
Epoch 46, Epoch SSIM: pixel -0.026341, grad 0.014524, laplacian 0.000008, dIdt 0.000406
10it [00:28, 2.83s/it]
Epoch 47, Epoch loss: total 19510.975977, pixel 0.372453, grad 10.398076, laplacian 1655.441370, dIdt 17844.764160
Epoch 47, Epoch SSIM: pixel -0.026301, grad 0.014510, laplacian 0.000008, dIdt 0.000404
10it [00:28, 2.82s/it]
Epoch 48, Epoch loss: total 19514.361621, pixel 0.372580, grad 10.404066, laplacian 1659.344427, dIdt 17844.240234
Epoch 48, Epoch SSIM: pixel -0.026262, grad 0.014496, laplacian 0.000009, dIdt 0.000402
10it [00:28, 2.83s/it]
Epoch 49, Epoch loss: total 19517.777051, pixel 0.372707, grad 10.410097, laplacian 1663.279437, dIdt 17843.714453
Epoch 49, Epoch SSIM: pixel -0.026223, grad 0.014483, laplacian 0.000010, dIdt 0.000401
10it [00:31, 3.16s/it]
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Epoch 50, Epoch loss: total 19521.222754, pixel 0.372834, grad 10.416169, laplacian 1667.246588, dIdt 17843.187109
Epoch 50, Epoch SSIM: pixel -0.026185, grad 0.014469, laplacian 0.000011, dIdt 0.000399
10it [00:28, 2.83s/it]
Epoch 51, Epoch loss: total 19524.697266, pixel 0.372963, grad 10.422283, laplacian 1671.245831, dIdt 17842.656445
Epoch 51, Epoch SSIM: pixel -0.026148, grad 0.014456, laplacian 0.000011, dIdt 0.000398
10it [00:28, 2.83s/it]
Epoch 52, Epoch loss: total 19528.202832, pixel 0.373092, grad 10.428438, laplacian 1675.277167, dIdt 17842.124316
Epoch 52, Epoch SSIM: pixel -0.026111, grad 0.014442, laplacian 0.000012, dIdt 0.000396
10it [00:28, 2.83s/it]
Epoch 53, Epoch loss: total 19531.737598, pixel 0.373222, grad 10.434634, laplacian 1679.340625, dIdt 17841.589355
Epoch 53, Epoch SSIM: pixel -0.026074, grad 0.014429, laplacian 0.000011, dIdt 0.000395
10it [00:28, 2.82s/it]
Epoch 54, Epoch loss: total 19535.303125, pixel 0.373352, grad 10.440872, laplacian 1683.436365, dIdt 17841.052637
Epoch 54, Epoch SSIM: pixel -0.026038, grad 0.014416, laplacian 0.000011, dIdt 0.000394
10it [00:28, 2.85s/it]
Epoch 55, Epoch loss: total 19538.898535, pixel 0.373484, grad 10.447150, laplacian 1687.564642, dIdt 17840.513184
Epoch 55, Epoch SSIM: pixel -0.026003, grad 0.014402, laplacian 0.000010, dIdt 0.000393
10it [00:28, 2.84s/it]
Epoch 56, Epoch loss: total 19542.524121, pixel 0.373615, grad 10.453469, laplacian 1691.725702, dIdt 17839.971484
Epoch 56, Epoch SSIM: pixel -0.025968, grad 0.014389, laplacian 0.000010, dIdt 0.000393
10it [00:28, 2.83s/it]
Epoch 57, Epoch loss: total 19546.180176, pixel 0.373748, grad 10.459829, laplacian 1695.919421, dIdt 17839.427148
Epoch 57, Epoch SSIM: pixel -0.025933, grad 0.014376, laplacian 0.000011, dIdt 0.000392
10it [00:28, 2.84s/it]
Epoch 58, Epoch loss: total 19549.866992, pixel 0.373881, grad 10.466230, laplacian 1700.146118, dIdt 17838.880664
Epoch 58, Epoch SSIM: pixel -0.025900, grad 0.014363, laplacian 0.000012, dIdt 0.000392
10it [00:28, 2.82s/it]
Epoch 59, Epoch loss: total 19553.584375, pixel 0.374015, grad 10.472671, laplacian 1704.405890, dIdt 17838.331836
Epoch 59, Epoch SSIM: pixel -0.025866, grad 0.014351, laplacian 0.000012, dIdt 0.000391
10it [00:31, 3.19s/it]
Epoch 60, Epoch loss: total 19557.333691, pixel 0.374150, grad 10.479154, laplacian 1708.699268, dIdt 17837.780859
Epoch 60, Epoch SSIM: pixel -0.025833, grad 0.014338, laplacian 0.000012, dIdt 0.000390
10it [00:28, 2.82s/it]
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Epoch 61, Epoch loss: total 19561.112305, pixel 0.374285, grad 10.485678, laplacian 1713.026251, dIdt 17837.226562
Epoch 61, Epoch SSIM: pixel -0.025801, grad 0.014325, laplacian 0.000011, dIdt 0.000390
10it [00:28, 2.84s/it]
Epoch 62, Epoch loss: total 19564.923633, pixel 0.374421, grad 10.492242, laplacian 1717.387061, dIdt 17836.669824
Epoch 62, Epoch SSIM: pixel -0.025769, grad 0.014313, laplacian 0.000012, dIdt 0.000389
10it [00:28, 2.82s/it]
Epoch 63, Epoch loss: total 19568.765820, pixel 0.374558, grad 10.498849, laplacian 1721.782013, dIdt 17836.110742
Epoch 63, Epoch SSIM: pixel -0.025738, grad 0.014300, laplacian 0.000012, dIdt 0.000388
10it [00:28, 2.88s/it]
Epoch 64, Epoch loss: total 19572.640723, pixel 0.374695, grad 10.505496, laplacian 1726.211426, dIdt 17835.548926
Epoch 64, Epoch SSIM: pixel -0.025707, grad 0.014288, laplacian 0.000011, dIdt 0.000387
10it [00:28, 2.82s/it]
Epoch 65, Epoch loss: total 19576.546875, pixel 0.374833, grad 10.512185, laplacian 1730.675598, dIdt 17834.984375
Epoch 65, Epoch SSIM: pixel -0.025676, grad 0.014275, laplacian 0.000011, dIdt 0.000385
10it [00:28, 2.85s/it]
Epoch 66, Epoch loss: total 19580.486035, pixel 0.374971, grad 10.518915, laplacian 1735.174561, dIdt 17834.417773
Epoch 66, Epoch SSIM: pixel -0.025646, grad 0.014262, laplacian 0.000011, dIdt 0.000384
10it [00:28, 2.85s/it]
Epoch 67, Epoch loss: total 19584.457520, pixel 0.375110, grad 10.525687, laplacian 1739.709033, dIdt 17833.847656
Epoch 67, Epoch SSIM: pixel -0.025617, grad 0.014250, laplacian 0.000011, dIdt 0.000382
10it [00:28, 2.86s/it]
Epoch 68, Epoch loss: total 19588.462305, pixel 0.375250, grad 10.532502, laplacian 1744.279230, dIdt 17833.275293
Epoch 68, Epoch SSIM: pixel -0.025588, grad 0.014237, laplacian 0.000011, dIdt 0.000380
10it [00:28, 2.85s/it]
Epoch 69, Epoch loss: total 19592.500098, pixel 0.375390, grad 10.539358, laplacian 1748.885400, dIdt 17832.700098
Epoch 69, Epoch SSIM: pixel -0.025559, grad 0.014225, laplacian 0.000011, dIdt 0.000379
10it [00:31, 3.19s/it]
Epoch 70, Epoch loss: total 19596.572461, pixel 0.375531, grad 10.546258, laplacian 1753.528198, dIdt 17832.122461
Epoch 70, Epoch SSIM: pixel -0.025531, grad 0.014213, laplacian 0.000011, dIdt 0.000377
10it [00:28, 2.84s/it]
Epoch 71, Epoch loss: total 19600.679004, pixel 0.375673, grad 10.553200, laplacian 1758.207867, dIdt 17831.542090
Epoch 71, Epoch SSIM: pixel -0.025504, grad 0.014201, laplacian 0.000011, dIdt 0.000376
10it [00:28, 2.85s/it]
```

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Epoch 72, Epoch loss: total 19604.819727, pixel 0.375815, grad 10.560185, lapl  
acian 1762.924359, dIdt 17830.959180  
Epoch 72, Epoch SSIM: pixel -0.025476, grad 0.014189, laplacian 0.000011, dIdt  
0.000376  
10it [00:28, 2.84s/it]  
Epoch 73, Epoch loss: total 19608.994238, pixel 0.375958, grad 10.567213, lapl  
acian 1767.678192, dIdt 17830.372656  
Epoch 73, Epoch SSIM: pixel -0.025450, grad 0.014178, laplacian 0.000011, dIdt  
0.000375  
10it [00:28, 2.84s/it]  
Epoch 74, Epoch loss: total 19613.203613, pixel 0.376101, grad 10.574285, lapl  
acian 1772.469470, dIdt 17829.783887  
Epoch 74, Epoch SSIM: pixel -0.025424, grad 0.014166, laplacian 0.000010, dIdt  
0.000375  
10it [00:28, 2.84s/it]  
Epoch 75, Epoch loss: total 19617.449316, pixel 0.376245, grad 10.581400, lapl  
acian 1777.298889, dIdt 17829.192773  
Epoch 75, Epoch SSIM: pixel -0.025398, grad 0.014155, laplacian 0.000011, dIdt  
0.000375  
10it [00:28, 2.84s/it]  
Epoch 76, Epoch loss: total 19621.729883, pixel 0.376389, grad 10.588559, lapl  
acian 1782.167108, dIdt 17828.597754  
Epoch 76, Epoch SSIM: pixel -0.025373, grad 0.014144, laplacian 0.000011, dIdt  
0.000376  
10it [00:28, 2.87s/it]  
Epoch 77, Epoch loss: total 19626.047266, pixel 0.376535, grad 10.595762, lapl  
acian 1787.073828, dIdt 17828.000977  
Epoch 77, Epoch SSIM: pixel -0.025348, grad 0.014133, laplacian 0.000010, dIdt  
0.000376  
10it [00:28, 2.84s/it]  
Epoch 78, Epoch loss: total 19630.400977, pixel 0.376680, grad 10.603010, lapl  
acian 1792.020093, dIdt 17827.401172  
Epoch 78, Epoch SSIM: pixel -0.025323, grad 0.014122, laplacian 0.000011, dIdt  
0.000376  
10it [00:28, 2.85s/it]  
Epoch 79, Epoch loss: total 19634.791016, pixel 0.376826, grad 10.610303, lapl  
acian 1797.006012, dIdt 17826.797559  
Epoch 79, Epoch SSIM: pixel -0.025299, grad 0.014112, laplacian 0.000011, dIdt  
0.000376  
10it [00:32, 3.22s/it]  
Epoch 80, Epoch loss: total 19639.218066, pixel 0.376973, grad 10.617641, lapl  
acian 1802.032056, dIdt 17826.191504  
Epoch 80, Epoch SSIM: pixel -0.025276, grad 0.014101, laplacian 0.000010, dIdt  
0.000375  
-----Finished-----  
-----Generating Data-----  
100%|██████████| 10/10 [00:00<00:00, 1275.02it/s]  
-----Finished-----
```

```

10it [00:18,  1.88s/it]
ffmpeg version 4.1.9-0+deb10u1 Copyright (c) 2000-2022 the FFmpeg developers
  built with gcc 8 (Debian 8.3.0-6)
  configuration: --prefix=/usr --extra-version=0+deb10u1 --toolchain=hardened
  --libdir=/usr/lib/x86_64-linux-gnu --incdir=/usr/include/x86_64-linux-gnu --arch=amd64 --enable-gpl --disable-stripping --enable-avresample --disable-filter=resample --enable-avisynth --enable-gnutls --enable-ladspa --enable-libaom --enable-libass --enable-libbluray --enable-libbs2b --enable-libcaca --enable-libcdio --enable-libcodec2 --enable-libflite --enable-libfontconfig --enable-libfreetype --enable-libfribidi --enable-libgme --enable-libgsm --enable-libjack --enable-libmp3lame --enable-libmysofa --enable-libopenjpeg --enable-libopenmp3 --enable-libopus --enable-libpulse --enable-librsvg --enable-librubberband --enable-libshine --enable-libsنappy --enable-libsoxr --enable-libspeex --enable-libssh --enable-libtheora --enable-libtwolame --enable-libvidstab --enable-libvorbis --enable-libvpx --enable-libwavpack --enable-libwebp --enable-libx265 --enable-libxml2 --enable-libxvid --enable-libzmq --enable-libzvbi --enable-lv2 --enable-omx --enable-openal --enable-opengl --enable-sdl2 --enable-libdc1394 --enable-libdrm --enable-libiec61883 --enable-chromaprint --enable-frei0r --enable-libx264 --enable-shared
  libavutil      56. 22.100 / 56. 22.100
  libavcodec     58. 35.100 / 58. 35.100
  libavformat    58. 20.100 / 58. 20.100
  libavdevice     58.  5.100 / 58.  5.100
  libavfilter     7. 40.101 /  7. 40.101
  libavresample   4.  0.  0 /  4.  0.  0
  libswscale      5.  3.100 /  5.  3.100
  libswresample   3.  3.100 /  3.  3.100
  libpostproc    55.  3.100 / 55.  3.100
Input #0, image2, from 'tmp/file%02d.png':
  Duration: 00:00:05.00, start: 0.000000, bitrate: N/A
    Stream #0:0: Video: png, rgba(pc), 1296x432 [SAR 2835:2835 DAR 3:1], 2 fps, 2 tbr, 2 tbn, 2 tbc
    Stream mapping:
      Stream #0:0 -> #0:0 (png (native) -> h264 (libx264))
Press [q] to stop, [?] for help
[libx264 @ 0x560bce691f00] using SAR=1/1
[libx264 @ 0x560bce691f00] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2 AVX FMA3 BMI2 AVX2
[libx264 @ 0x560bce691f00] profile High, level 3.1
[libx264 @ 0x560bce691f00] 264 - core 155 r2917 0a84d98 - H.264/MPEG-4 AVC codec - Copyleft 2003-2018 - http://www.videolan.org/x264.html - options: cabac=1 ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00:0.00 mixed_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast_pskip=1 chroma_qp_offset=-2 threads=3 lookahead_threads=1 sliced_threads=0 nr=0 decimate=1 interlaced=0 bluray_compat=0 constrained_intra=0 bframes=3 b_pyramid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 keyint_min=25 scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=2.3.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ratio=1.40 aq=1:1.00
Output #0, mp4, to '/home/jupyter/videos/runs/cameraman/experiments/1.0_1.0_1.0_1.0/siren_decay_multi_le-04_video.mp4':
  Metadata:
    encoder : Lavf58.20.100
  Stream #0:0: Video: h264 (libx264) (avc1 / 0x31637661), yuv420p, 1296x432 [SAR 1:1 DAR 3:1], q=-1--1, 30 fps, 15360 tbn, 30 tbc
  Metadata:
    encoder : Lavc58.35.100 libx264
  Side data:
    cpb: bitrate max/min/avg: 0/0/0 buffer size: 0 vbv_delay: -1
    frame= 150 fps=104 q=-1.0 Lsize= 225kB time=00:00:04.90 bitrate= 375.6kbit/s dup=140 drop=0 speed=3.39x

```

```
video:222kB audio:0kB subtitle:0kB other streams:0kB global headers:0kB muxing overhead: 1.166068%
[libx264 @ 0x560bce691f00] frame I:1      Avg QP:15.64  size: 45957
[libx264 @ 0x560bce691f00] frame P:38     Avg QP:19.21  size: 4516
[libx264 @ 0x560bce691f00] frame B:111    Avg QP:14.74  size:     83
[libx264 @ 0x560bce691f00] consecutive B-frames: 1.3% 0.0% 0.0% 98.7%
[libx264 @ 0x560bce691f00] mb I  I16..4: 59.8% 16.6% 23.6%
[libx264 @ 0x560bce691f00] mb P  I16..4:  0.5%  2.3%  0.8%  P16..4:  3.9%  1.
0% 1.0% 0.0% 0.0%  skip:90.5%
[libx264 @ 0x560bce691f00] mb B  I16..4:  0.1%  0.0%  0.0%  B16..8:  2.9%  0.
0% 0.0% direct: 0.0% skip:97.0% L0:47.1% L1:52.8% BI: 0.1%
[libx264 @ 0x560bce691f00] 8x8 transform intra:43.0% inter:61.5%
[libx264 @ 0x560bce691f00] coded y,uvDC,uvAC intra: 56.8% 63.7% 60.9% inter:
0.8% 1.2% 0.7%
[libx264 @ 0x560bce691f00] i16 v,h,dc,p: 71% 21% 7% 1%
[libx264 @ 0x560bce691f00] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 18% 13% 14% 5% 11%
11% 10% 8% 10%
[libx264 @ 0x560bce691f00] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 28% 25% 16% 4% 7%
6% 6% 4% 4%
[libx264 @ 0x560bce691f00] i8c dc,h,v,p: 51% 22% 21% 7%
[libx264 @ 0x560bce691f00] Weighted P-Frames: Y:0.0% UV:0.0%
[libx264 @ 0x560bce691f00] ref P L0: 73.0% 19.0% 7.2% 0.8%
[libx264 @ 0x560bce691f00] ref B L0: 71.5% 28.0% 0.6%
[libx264 @ 0x560bce691f00] ref B L1: 98.1% 1.9%
[libx264 @ 0x560bce691f00] kb/s:362.79
```

-----Generating Data-----

100%|██████████| 10/10 [00:00<00:00, 1156.38it/s]

-----Finished-----

-----Begin Training-----

10it [00:27, 2.78s/it]

Epoch 1, Epoch loss: total 17845.014551, pixel 0.848982, grad 7.828457, laplacian 0.016025, dIdt 17836.321289

Epoch 1, Epoch SSIM: pixel 0.172948, grad 0.072527, laplacian 0.077561, dIdt 0.000078

10it [00:28, 2.85s/it]

Epoch 2, Epoch loss: total 17544.579395, pixel 2.105466, grad 7.851943, laplacian 0.017408, dIdt 17534.604785

Epoch 2, Epoch SSIM: pixel 0.127686, grad 0.057628, laplacian 0.068315, dIdt 0.000033

10it [00:28, 2.81s/it]

Epoch 3, Epoch loss: total 16984.784180, pixel 5.771120, grad 8.015386, laplacian 0.021875, dIdt 16970.975879

Epoch 3, Epoch SSIM: pixel 0.034924, grad 0.036089, laplacian 0.087360, dIdt 0.000106

10it [00:28, 2.84s/it]

Epoch 4, Epoch loss: total 16054.395020, pixel 23.445719, grad 8.511076, laplacian 0.041441, dIdt 16022.396582

Epoch 4, Epoch SSIM: pixel 0.015559, grad 0.025272, laplacian 0.029752, dIdt 0.000352

10it [00:28, 2.82s/it]

Epoch 5, Epoch loss: total 14914.842969, pixel 84.757664, grad 9.335526, laplacian 0.093877, dIdt 14820.655957

Epoch 5, Epoch SSIM: pixel 0.011498, grad 0.020205, laplacian 0.011120, dIdt 0.000880

10it [00:28, 2.81s/it]

```
Epoch 6, Epoch loss: total 13854.008691, pixel 198.669277, grad 10.469145, lap  
lacian 0.170421, dIdt 13644.699707  
Epoch 6, Epoch SSIM: pixel -0.003141, grad 0.017126, laplacian 0.010689, dIdt  
0.001701  
10it [00:28, 2.81s/it]  
Epoch 7, Epoch loss: total 13191.785156, pixel 360.497157, grad 12.348960, lap  
lacian 0.270557, dIdt 12818.668555  
Epoch 7, Epoch SSIM: pixel -0.000995, grad 0.014500, laplacian 0.004392, dIdt  
0.002606  
10it [00:28, 2.82s/it]  
Epoch 8, Epoch loss: total 12921.624512, pixel 496.408428, grad 15.203077, lap  
lacian 0.369111, dIdt 12409.643945  
Epoch 8, Epoch SSIM: pixel 0.007400, grad 0.012407, laplacian 0.004941, dIdt  
0.003319  
10it [00:28, 2.83s/it]  
Epoch 9, Epoch loss: total 12806.243066, pixel 527.089569, grad 18.120275, lap  
lacian 0.420875, dIdt 12260.612305  
Epoch 9, Epoch SSIM: pixel 0.005409, grad 0.011118, laplacian 0.004792, dIdt  
0.003674  
10it [00:31, 3.13s/it]  
Epoch 10, Epoch loss: total 12718.076660, pixel 485.535718, grad 19.987640, la  
placian 0.419818, dIdt 12212.133496  
Epoch 10, Epoch SSIM: pixel 0.005235, grad 0.010469, laplacian 0.004478, dIdt  
0.003731  
10it [00:28, 2.81s/it]  
Epoch 11, Epoch loss: total 12663.744727, pixel 437.959565, grad 20.965471, la  
placian 0.397918, dIdt 12204.421680  
Epoch 11, Epoch SSIM: pixel 0.005431, grad 0.010144, laplacian 0.005875, dIdt  
0.003676  
10it [00:28, 2.83s/it]  
Epoch 12, Epoch loss: total 12641.532812, pixel 414.712281, grad 21.275571, la  
placian 0.376956, dIdt 12205.168164  
Epoch 12, Epoch SSIM: pixel 0.002122, grad 0.010051, laplacian 0.006674, dIdt  
0.003634  
10it [00:28, 2.84s/it]  
Epoch 13, Epoch loss: total 12620.651465, pixel 408.093668, grad 21.327120, la  
placian 0.365354, dIdt 12190.865332  
Epoch 13, Epoch SSIM: pixel 0.000780, grad 0.010051, laplacian 0.006649, dIdt  
0.003647  
10it [00:28, 2.82s/it]  
Epoch 14, Epoch loss: total 12596.286328, pixel 407.864974, grad 21.470922, la  
placian 0.362460, dIdt 12166.587988  
Epoch 14, Epoch SSIM: pixel 0.000541, grad 0.010038, laplacian 0.005377, dIdt  
0.003691  
10it [00:28, 2.83s/it]  
Epoch 15, Epoch loss: total 12572.565137, pixel 409.008009, grad 21.786553, la  
placian 0.365824, dIdt 12141.404688  
Epoch 15, Epoch SSIM: pixel 0.000199, grad 0.009989, laplacian 0.005189, dIdt  
0.003737  
10it [00:28, 2.84s/it]  
Epoch 16, Epoch loss: total 12549.710547, pixel 407.565052, grad 22.244309, la  
placian 0.371693, dIdt 12119.529492  
Epoch 16, Epoch SSIM: pixel 0.000354, grad 0.009910, laplacian 0.004762, dIdt  
0.003774  
10it [00:28, 2.88s/it]
```

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Epoch 17, Epoch loss: total 12529.983496, pixel 405.763210, grad 22.814845, la  
placian 0.381724, dIdt 12101.023730  
Epoch 17, Epoch SSIM: pixel 0.000104, grad 0.009811, laplacian 0.005850, dIdt  
0.003799  
10it [00:28, 2.84s/it]  
Epoch 18, Epoch loss: total 12510.853027, pixel 403.135111, grad 23.493091, la  
placian 0.395953, dIdt 12083.828906  
Epoch 18, Epoch SSIM: pixel -0.000056, grad 0.009703, laplacian 0.004480, dIdt  
0.003820  
10it [00:28, 2.82s/it]  
Epoch 19, Epoch loss: total 12494.271387, pixel 402.354042, grad 24.188258, la  
placian 0.415317, dIdt 12067.313672  
Epoch 19, Epoch SSIM: pixel -0.000097, grad 0.009614, laplacian 0.002844, dIdt  
0.003840  
10it [00:31, 3.13s/it]  
Epoch 20, Epoch loss: total 12476.908789, pixel 401.215760, grad 24.928617, la  
placian 0.440851, dIdt 12050.323535  
Epoch 20, Epoch SSIM: pixel -0.000052, grad 0.009527, laplacian 0.002459, dIdt  
0.003861  
10it [00:28, 2.85s/it]  
Epoch 21, Epoch loss: total 12458.860547, pixel 399.625798, grad 25.772797, la  
placian 0.473406, dIdt 12032.988477  
Epoch 21, Epoch SSIM: pixel 0.000075, grad 0.009436, laplacian 0.001762, dIdt  
0.003884  
10it [00:28, 2.82s/it]  
Epoch 22, Epoch loss: total 12442.248047, pixel 399.226698, grad 26.629228, la  
placian 0.514152, dIdt 12015.877930  
Epoch 22, Epoch SSIM: pixel 0.000196, grad 0.009376, laplacian 0.001223, dIdt  
0.003907  
10it [00:28, 2.82s/it]  
Epoch 23, Epoch loss: total 12423.907129, pixel 397.141960, grad 27.432445, la  
placian 0.562329, dIdt 11998.770313  
Epoch 23, Epoch SSIM: pixel 0.000275, grad 0.009351, laplacian 0.001166, dIdt  
0.003930  
10it [00:28, 2.80s/it]  
Epoch 24, Epoch loss: total 12407.546582, pixel 396.696228, grad 28.195279, la  
placian 0.621415, dIdt 11982.033789  
Epoch 24, Epoch SSIM: pixel 0.000308, grad 0.009367, laplacian 0.001010, dIdt  
0.003952  
10it [00:28, 2.82s/it]  
Epoch 25, Epoch loss: total 12389.845801, pixel 395.017390, grad 28.917605, la  
placian 0.692615, dIdt 11965.218164  
Epoch 25, Epoch SSIM: pixel 0.000361, grad 0.009430, laplacian 0.000856, dIdt  
0.003973  
10it [00:28, 2.84s/it]  
Epoch 26, Epoch loss: total 12372.497363, pixel 393.702775, grad 29.549893, la  
placian 0.777712, dIdt 11948.467188  
Epoch 26, Epoch SSIM: pixel 0.000387, grad 0.009568, laplacian 0.000689, dIdt  
0.003996  
10it [00:28, 2.85s/it]  
Epoch 27, Epoch loss: total 12355.527441, pixel 392.737031, grad 30.045206, la  
placian 0.879923, dIdt 11931.865234  
Epoch 27, Epoch SSIM: pixel 0.000454, grad 0.009806, laplacian 0.000573, dIdt  
0.004019  
10it [00:28, 2.82s/it]
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Epoch 28, Epoch loss: total 12338.235449, pixel 391.431487, grad 30.433931, la  
placian 1.002706, dIdt 11915.367383  
Epoch 28, Epoch SSIM: pixel 0.000472, grad 0.010171, laplacian 0.000382, dIdt  
0.004042  
10it [00:28, 2.82s/it]  
Epoch 29, Epoch loss: total 12321.478125, pixel 390.346109, grad 30.706611, la  
placian 1.146225, dIdt 11899.279199  
Epoch 29, Epoch SSIM: pixel 0.000518, grad 0.010747, laplacian 0.000359, dIdt  
0.004065  
10it [00:31, 3.13s/it]  
Epoch 30, Epoch loss: total 12304.670898, pixel 388.921510, grad 30.836346, la  
placian 1.312741, dIdt 11883.600293  
Epoch 30, Epoch SSIM: pixel 0.000964, grad 0.011698, laplacian 0.000278, dIdt  
0.004088  
10it [00:28, 2.84s/it]  
Epoch 31, Epoch loss: total 12289.128320, pixel 388.557121, grad 30.882160, la  
placian 1.509794, dIdt 11868.179199  
Epoch 31, Epoch SSIM: pixel 0.001263, grad 0.013320, laplacian 0.000260, dIdt  
0.004110  
10it [00:28, 2.83s/it]  
Epoch 32, Epoch loss: total 12272.105859, pixel 386.972930, grad 30.915967, la  
placian 1.745317, dIdt 11852.471582  
Epoch 32, Epoch SSIM: pixel 0.001270, grad 0.015526, laplacian 0.000272, dIdt  
0.004134  
10it [00:28, 2.85s/it]  
Epoch 33, Epoch loss: total 12257.617578, pixel 387.413973, grad 30.945990, la  
placian 2.020136, dIdt 11837.237402  
Epoch 33, Epoch SSIM: pixel 0.002022, grad 0.018261, laplacian 0.000277, dIdt  
0.004157  
10it [00:28, 2.87s/it]  
Epoch 34, Epoch loss: total 12241.190234, pixel 385.702869, grad 30.926137, la  
placian 2.338137, dIdt 11822.223242  
Epoch 34, Epoch SSIM: pixel 0.002876, grad 0.019193, laplacian 0.000371, dIdt  
0.004180  
10it [00:28, 2.83s/it]  
Epoch 35, Epoch loss: total 12227.383301, pixel 386.064654, grad 30.950269, la  
placian 2.706915, dIdt 11807.661426  
Epoch 35, Epoch SSIM: pixel 0.004105, grad 0.019547, laplacian 0.001955, dIdt  
0.004202  
10it [00:28, 2.81s/it]  
Epoch 36, Epoch loss: total 12211.572754, pixel 384.423555, grad 31.047322, la  
placian 3.139430, dIdt 11792.962402  
Epoch 36, Epoch SSIM: pixel 0.005851, grad 0.018550, laplacian 0.002584, dIdt  
0.004225  
10it [00:28, 2.82s/it]  
Epoch 37, Epoch loss: total 12199.421875, pixel 385.723474, grad 31.303022, la  
placian 3.643798, dIdt 11778.751367  
Epoch 37, Epoch SSIM: pixel 0.007738, grad 0.018273, laplacian 0.002733, dIdt  
0.004247  
10it [00:28, 2.81s/it]  
Epoch 38, Epoch loss: total 12184.326074, pixel 384.202796, grad 31.667909, la  
placian 4.232487, dIdt 11764.222852  
Epoch 38, Epoch SSIM: pixel 0.010119, grad 0.017043, laplacian 0.003257, dIdt  
0.004270  
10it [00:28, 2.85s/it]
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Epoch 39, Epoch loss: total 12173.535449, pixel 386.072500, grad 32.261935, la  
placian 4.904406, dIdt 11750.296582  
Epoch 39, Epoch SSIM: pixel 0.013001, grad 0.016608, laplacian 0.003658, dIdt  
0.004292  
10it [00:31, 3.13s/it]  
Epoch 40, Epoch loss: total 12159.049121, pixel 384.139264, grad 32.909424, la  
placian 5.658951, dIdt 11736.341504  
Epoch 40, Epoch SSIM: pixel 0.017204, grad 0.016047, laplacian 0.003879, dIdt  
0.004314  
10it [00:28, 2.81s/it]  
Epoch 41, Epoch loss: total 12149.961426, pixel 386.505487, grad 33.822891, la  
placian 6.488718, dIdt 11723.144238  
Epoch 41, Epoch SSIM: pixel 0.021053, grad 0.014903, laplacian 0.003565, dIdt  
0.004335  
10it [00:28, 2.82s/it]  
Epoch 42, Epoch loss: total 12137.251465, pixel 385.003855, grad 34.741333, la  
placian 7.395848, dIdt 11710.110547  
Epoch 42, Epoch SSIM: pixel 0.020884, grad 0.014554, laplacian 0.003727, dIdt  
0.004355  
10it [00:28, 2.88s/it]  
Epoch 43, Epoch loss: total 12129.669922, pixel 387.827613, grad 36.026252, la  
placian 8.389328, dIdt 11697.426758  
Epoch 43, Epoch SSIM: pixel 0.013688, grad 0.014104, laplacian 0.002163, dIdt  
0.004376  
10it [00:28, 2.81s/it]  
Epoch 44, Epoch loss: total 12118.087305, pixel 386.329398, grad 37.354605, la  
placian 9.455819, dIdt 11684.947363  
Epoch 44, Epoch SSIM: pixel 0.003307, grad 0.013243, laplacian 0.002383, dIdt  
0.004396  
10it [00:28, 2.82s/it]  
Epoch 45, Epoch loss: total 12112.143359, pixel 389.381272, grad 38.997948, la  
placian 10.581885, dIdt 11673.182129  
Epoch 45, Epoch SSIM: pixel -0.001635, grad 0.012517, laplacian 0.003179, dIdt  
0.004414  
10it [00:28, 2.84s/it]  
Epoch 46, Epoch loss: total 12101.853223, pixel 388.116197, grad 40.592827, la  
placian 11.741762, dIdt 11661.402344  
Epoch 46, Epoch SSIM: pixel -0.003632, grad 0.012081, laplacian 0.001857, dIdt  
0.004433  
10it [00:28, 2.85s/it]  
Epoch 47, Epoch loss: total 12096.744922, pixel 391.069492, grad 42.491792, la  
placian 12.925119, dIdt 11650.258398  
Epoch 47, Epoch SSIM: pixel -0.003765, grad 0.011703, laplacian 0.001652, dIdt  
0.004450  
10it [00:28, 2.86s/it]  
Epoch 48, Epoch loss: total 12087.980078, pixel 389.978166, grad 44.221461, la  
placian 14.092114, dIdt 11639.688184  
Epoch 48, Epoch SSIM: pixel -0.003275, grad 0.011391, laplacian 0.001850, dIdt  
0.004466  
10it [00:28, 2.87s/it]  
Epoch 49, Epoch loss: total 12083.399805, pixel 392.575965, grad 46.208834, la  
placian 15.246374, dIdt 11629.368555  
Epoch 49, Epoch SSIM: pixel -0.002683, grad 0.011037, laplacian 0.001622, dIdt  
0.004482  
10it [00:31, 3.16s/it]
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Epoch 50, Epoch loss: total 12076.053711, pixel 392.032444, grad 48.008135, la  
placian 16.327803, dIdt 11619.685254  
Epoch 50, Epoch SSIM: pixel -0.002137, grad 0.010690, laplacian 0.000906, dIdt  
0.004495  
10it [00:28, 2.82s/it]  
Epoch 51, Epoch loss: total 12071.484863, pixel 393.854732, grad 49.926650, la  
placian 17.345093, dIdt 11610.358398  
Epoch 51, Epoch SSIM: pixel -0.001550, grad 0.010335, laplacian 0.000944, dIdt  
0.004509  
10it [00:28, 2.83s/it]  
Epoch 52, Epoch loss: total 12065.450000, pixel 393.875448, grad 51.665261, la  
placian 18.263706, dIdt 11601.645508  
Epoch 52, Epoch SSIM: pixel -0.001141, grad 0.010026, laplacian 0.000842, dIdt  
0.004521  
10it [00:28, 2.84s/it]  
Epoch 53, Epoch loss: total 12060.936328, pixel 395.205574, grad 53.449064, la  
placian 19.102846, dIdt 11593.179004  
Epoch 53, Epoch SSIM: pixel -0.000790, grad 0.009749, laplacian 0.000707, dIdt  
0.004533  
10it [00:28, 2.83s/it]  
Epoch 54, Epoch loss: total 12055.657715, pixel 395.518665, grad 55.085962, la  
placian 19.830998, dIdt 11585.221973  
Epoch 54, Epoch SSIM: pixel -0.000568, grad 0.009513, laplacian 0.000618, dIdt  
0.004543  
10it [00:28, 2.83s/it]  
Epoch 55, Epoch loss: total 12051.068262, pixel 396.367876, grad 56.687257, la  
placian 20.466209, dIdt 11577.546973  
Epoch 55, Epoch SSIM: pixel -0.000358, grad 0.009310, laplacian 0.000818, dIdt  
0.004554  
10it [00:28, 2.84s/it]  
Epoch 56, Epoch loss: total 12046.382715, pixel 396.907184, grad 58.168009, la  
placian 21.004193, dIdt 11570.303320  
Epoch 56, Epoch SSIM: pixel -0.000250, grad 0.009139, laplacian 0.001064, dIdt  
0.004563  
10it [00:28, 2.84s/it]  
Epoch 57, Epoch loss: total 12041.784961, pixel 397.431306, grad 59.573679, la  
placian 21.468095, dIdt 11563.311914  
Epoch 57, Epoch SSIM: pixel -0.000188, grad 0.008987, laplacian 0.001095, dIdt  
0.004572  
10it [00:28, 2.85s/it]  
Epoch 58, Epoch loss: total 12037.250098, pixel 397.824597, grad 60.901575, la  
placian 21.868261, dIdt 11556.655762  
Epoch 58, Epoch SSIM: pixel -0.000166, grad 0.008862, laplacian 0.000814, dIdt  
0.004580  
10it [00:28, 2.88s/it]  
Epoch 59, Epoch loss: total 12032.900684, pixel 398.192068, grad 62.163051, la  
placian 22.219387, dIdt 11550.326172  
Epoch 59, Epoch SSIM: pixel -0.000178, grad 0.008770, laplacian 0.001135, dIdt  
0.004588  
10it [00:32, 3.21s/it]  
Epoch 60, Epoch loss: total 12028.632715, pixel 398.479717, grad 63.354614, la  
placian 22.532992, dIdt 11544.265234  
Epoch 60, Epoch SSIM: pixel -0.000237, grad 0.008695, laplacian 0.001256, dIdt  
0.004595  
10it [00:28, 2.85s/it]
```

```
Epoch 61, Epoch loss: total 12024.460645, pixel 398.739760, grad 64.487297, la  
placian 22.822487, dIdt 11538.411230  
Epoch 61, Epoch SSIM: pixel -0.000325, grad 0.008623, laplacian 0.001289, dIdt  
0.004603  
10it [00:28, 2.87s/it]  
Epoch 62, Epoch loss: total 12020.454980, pixel 398.974998, grad 65.562643, la  
placian 23.096253, dIdt 11532.820996  
Epoch 62, Epoch SSIM: pixel -0.000435, grad 0.008544, laplacian 0.001101, dIdt  
0.004609  
10it [00:28, 2.85s/it]  
Epoch 63, Epoch loss: total 12016.501074, pixel 399.067047, grad 66.577919, la  
placian 23.362510, dIdt 11527.493457  
Epoch 63, Epoch SSIM: pixel -0.000563, grad 0.008481, laplacian 0.001395, dIdt  
0.004616  
10it [00:28, 2.87s/it]  
Epoch 64, Epoch loss: total 12012.754590, pixel 399.182101, grad 67.543547, la  
placian 23.629218, dIdt 11522.399512  
Epoch 64, Epoch SSIM: pixel -0.000691, grad 0.008449, laplacian 0.001616, dIdt  
0.004622  
10it [00:28, 2.87s/it]  
Epoch 65, Epoch loss: total 12009.087305, pixel 399.213956, grad 68.444961, la  
placian 23.898366, dIdt 11517.529883  
Epoch 65, Epoch SSIM: pixel -0.000805, grad 0.008408, laplacian 0.000954, dIdt  
0.004627  
10it [00:28, 2.84s/it]  
Epoch 66, Epoch loss: total 12005.494238, pixel 399.156843, grad 69.301235, la  
placian 24.178212, dIdt 11512.858105  
Epoch 66, Epoch SSIM: pixel -0.000898, grad 0.008352, laplacian 0.000884, dIdt  
0.004633  
10it [00:28, 2.86s/it]  
Epoch 67, Epoch loss: total 12002.096680, pixel 399.102657, grad 70.114675, la  
placian 24.467079, dIdt 11508.412207  
Epoch 67, Epoch SSIM: pixel -0.000947, grad 0.008321, laplacian 0.000598, dIdt  
0.004638  
10it [00:28, 2.87s/it]  
Epoch 68, Epoch loss: total 11998.680664, pixel 398.908008, grad 70.868688, la  
placian 24.758235, dIdt 11504.145801  
Epoch 68, Epoch SSIM: pixel -0.000954, grad 0.008250, laplacian 0.000575, dIdt  
0.004642  
10it [00:28, 2.86s/it]  
Epoch 69, Epoch loss: total 11995.584668, pixel 398.907824, grad 71.598090, la  
placian 25.060018, dIdt 11500.018652  
Epoch 69, Epoch SSIM: pixel -0.000914, grad 0.008173, laplacian 0.000579, dIdt  
0.004647  
10it [00:31, 3.17s/it]  
Epoch 70, Epoch loss: total 11992.441699, pixel 398.715449, grad 72.265743, la  
placian 25.359841, dIdt 11496.100684  
Epoch 70, Epoch SSIM: pixel -0.000797, grad 0.008118, laplacian 0.000551, dIdt  
0.004651  
10it [00:28, 2.87s/it]  
Epoch 71, Epoch loss: total 11989.425000, pixel 398.539259, grad 72.898365, la  
placian 25.668962, dIdt 11492.318457  
Epoch 71, Epoch SSIM: pixel -0.000612, grad 0.008080, laplacian 0.000500, dIdt  
0.004655  
10it [00:28, 2.90s/it]
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Epoch 72, Epoch loss: total 11986.590918, pixel 398.393930, grad 73.510323, la  
placian 25.990922, dIIdt 11488.695801  
Epoch 72, Epoch SSIM: pixel -0.000321, grad 0.008053, laplacian 0.000596, dIIdt  
0.004659  
10it [00:28, 2.86s/it]  
Epoch 73, Epoch loss: total 11983.587402, pixel 397.990435, grad 74.067587, la  
placian 26.318883, dIIdt 11485.210547  
Epoch 73, Epoch SSIM: pixel 0.000035, grad 0.008031, laplacian 0.000662, dIIdt  
0.004663  
10it [00:28, 2.86s/it]  
Epoch 74, Epoch loss: total 11980.892383, pixel 397.798205, grad 74.622654, la  
placian 26.667215, dIIdt 11481.804492  
Epoch 74, Epoch SSIM: pixel 0.000389, grad 0.008004, laplacian 0.000649, dIIdt  
0.004666  
10it [00:28, 2.85s/it]  
Epoch 75, Epoch loss: total 11978.184375, pixel 397.461771, grad 75.129563, la  
placian 27.021233, dIIdt 11478.571680  
Epoch 75, Epoch SSIM: pixel 0.000811, grad 0.007971, laplacian 0.000617, dIIdt  
0.004669  
10it [00:28, 2.84s/it]  
Epoch 76, Epoch loss: total 11975.595215, pixel 397.158518, grad 75.611684, la  
placian 27.384790, dIIdt 11475.440332  
Epoch 76, Epoch SSIM: pixel 0.001271, grad 0.007936, laplacian 0.000665, dIIdt  
0.004672  
10it [00:28, 2.84s/it]  
Epoch 77, Epoch loss: total 11973.043066, pixel 396.821339, grad 76.071454, la  
placian 27.756009, dIIdt 11472.394336  
Epoch 77, Epoch SSIM: pixel 0.001780, grad 0.007902, laplacian 0.000584, dIIdt  
0.004675  
10it [00:28, 2.84s/it]  
Epoch 78, Epoch loss: total 11970.529297, pixel 396.433896, grad 76.507248, la  
placian 28.137413, dIIdt 11469.450781  
Epoch 78, Epoch SSIM: pixel 0.002269, grad 0.007874, laplacian 0.000515, dIIdt  
0.004677  
10it [00:28, 2.85s/it]  
Epoch 79, Epoch loss: total 11968.017285, pixel 395.975354, grad 76.908742, la  
placian 28.521496, dIIdt 11466.611719  
Epoch 79, Epoch SSIM: pixel 0.002627, grad 0.007843, laplacian 0.000539, dIIdt  
0.004679  
10it [00:31, 3.16s/it]  
Epoch 80, Epoch loss: total 11965.755664, pixel 395.687305, grad 77.301189, la  
placian 28.917309, dIIdt 11463.849902  
Epoch 80, Epoch SSIM: pixel 0.002920, grad 0.007815, laplacian 0.000218, dIIdt  
0.004681  
-----Finished-----  
-----Generating Data-----  
100%|██████████| 10/10 [00:00<00:00, 1275.41it/s]  
-----Finished-----
```

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10it [00:19,  1.93s/it]
ffmpeg version 4.1.9-0+deb10u1 Copyright (c) 2000-2022 the FFmpeg developers
  built with gcc 8 (Debian 8.3.0-6)
  configuration: --prefix=/usr --extra-version=0+deb10u1 --toolchain=hardened
  --libdir=/usr/lib/x86_64-linux-gnu --incdir=/usr/include/x86_64-linux-gnu --arch=amd64 --enable-gpl --disable-stripping --enable-avresample --disable-filter=resample --enable-avisynth --enable-gnutls --enable-ladspa --enable-libaom --enable-libass --enable-libbluray --enable-libbs2b --enable-libcaca --enable-libcdio --enable-libcodec2 --enable-libflite --enable-libfontconfig --enable-libfreetype --enable-libfribidi --enable-libgme --enable-libgsm --enable-libjack --enable-libmp3lame --enable-libmysofa --enable-libopenjpeg --enable-libopenmp3 --enable-libopus --enable-libpulse --enable-librsvg --enable-librubberband --enable-libshine --enable-libsنappy --enable-libsoxr --enable-libspeex --enable-libssh --enable-libtheora --enable-libtwolame --enable-libvidstab --enable-libvorbis --enable-libvpx --enable-libwavpack --enable-libwebp --enable-libx265 --enable-libxml2 --enable-libxvid --enable-libzmq --enable-libzvbi --enable-lv2 --enable-omx --enable-openal --enable-opengl --enable-sdl2 --enable-libdc1394 --enable-libdrm --enable-libiec61883 --enable-chromaprint --enable-frei0r --enable-libx264 --enable-shared

  libavutil      56. 22.100 / 56. 22.100
  libavcodec     58. 35.100 / 58. 35.100
  libavformat    58. 20.100 / 58. 20.100
  libavdevice     58.  5.100 / 58.  5.100
  libavfilter     7. 40.101 /  7. 40.101
  libavresample    4.  0.  0 /  4.  0.  0
  libswscale       5.  3.100 /  5.  3.100
  libswresample    3.  3.100 /  3.  3.100
  libpostproc     55.  3.100 / 55.  3.100

Input #0, image2, from 'tmp/file%02d.png':
  Duration: 00:00:05.00, start: 0.000000, bitrate: N/A
    Stream #0:0: Video: png, rgba(pc), 1296x432 [SAR 2835:2835 DAR 3:1], 2 fps, 2 tbr, 2 tbn, 2 tbc
    Stream mapping:
      Stream #0:0 -> #0:0 (png (native) -> h264 (libx264))
    Press [q] to stop, [?] for help
    [libx264 @ 0x564a423e3f00] using SAR=1/1
    [libx264 @ 0x564a423e3f00] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2 AVX FMA3 BMI2 AVX2
    [libx264 @ 0x564a423e3f00] profile High, level 3.1
    [libx264 @ 0x564a423e3f00] 264 - core 155 r2917 0a84d98 - H.264/MPEG-4 AVC codec - Copyleft 2003-2018 - http://www.videolan.org/x264.html - options: cabac=1 ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00:0.00 mixed_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast_pskip=1 chroma_qp_offset=-2 threads=3 lookahead_threads=1 sliced_threads=0 nr=0 decimate=1 interlaced=0 bluray_compat=0 constrained_intra=0 bframes=3 b_pyr amid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 keyint_min=25 scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=2.3.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ratio=1.40 aq=1:1.00
    Output #0, mp4, to '/home/jupyter/videos/runs/cameraman/experiments/elu_uniform_lr_1e-04_video.mp4':

    Metadata:
      encoder : Lavf58.20.100
    Stream #0:0: Video: h264 (libx264) (avc1 / 0x31637661), yuv420p, 1296x432 [SAR 1:1 DAR 3:1], q=-1--1, 30 fps, 15360 tbn, 30 tbc
    Metadata:
      encoder : Lavc58.35.100 libx264
    Side data:
      cpb: bitrate max/min/avg: 0/0/0 buffer size: 0 vbv_delay: -1
      frame= 150 fps=105 q=-1.0 Lsize= 162kB time=00:00:04.90 bitrate= 270.3kbit/s dup=140 drop=0 speed=3.43x

```

```
video:159kB audio:0kB subtitle:0kB other streams:0kB global headers:0kB muxing overhead: 1.627993%
[libx264 @ 0x564a423e3f00] frame I:1      Avg QP:18.18  size: 39895
[libx264 @ 0x564a423e3f00] frame P:38     Avg QP:18.93  size: 2984
[libx264 @ 0x564a423e3f00] frame B:111    Avg QP:15.03  size:     80
[libx264 @ 0x564a423e3f00] consecutive B-frames: 1.3% 0.0% 0.0% 98.7%
[libx264 @ 0x564a423e3f00] mb I  I16..4: 48.6% 27.5% 23.9%
[libx264 @ 0x564a423e3f00] mb P  I16..4:  1.2%  0.7%  0.3%  P16..4:  4.9%  1.5%
[libx264 @ 0x564a423e3f00] 1.0%  0.0%  0.0%   skip:90.5%
[libx264 @ 0x564a423e3f00] mb B  I16..4:  0.1%  0.0%  0.0%  B16..8:  2.8%  0.0%  0.0%   direct: 0.0%  skip:97.2%  L0:44.9%  L1:54.9%  BI: 0.1%
[libx264 @ 0x564a423e3f00] 8x8 transform intra:29.7% inter:62.3%
[libx264 @ 0x564a423e3f00] coded y,uvDC,uvAC intra: 28.3% 51.7% 36.6% inter: 0.7% 1.2% 0.5%
[libx264 @ 0x564a423e3f00] i16 v,h,dc,p: 42% 20%  5% 33%
[libx264 @ 0x564a423e3f00] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 28% 16% 28%  2%  1% 2%  1% 20%
[libx264 @ 0x564a423e3f00] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 31% 31% 18%  4%  3% 3%  3%  2%  5%
[libx264 @ 0x564a423e3f00] i8c dc,h,v,p: 44% 21% 11% 24%
[libx264 @ 0x564a423e3f00] Weighted P-Frames: Y:0.0% UV:0.0%
[libx264 @ 0x564a423e3f00] ref P L0: 78.8% 13.2%  7.3%  0.7%
[libx264 @ 0x564a423e3f00] ref B L0: 73.0% 26.8%  0.2%
[libx264 @ 0x564a423e3f00] ref B L1: 98.1%  1.9%
[libx264 @ 0x564a423e3f00] kb/s:259.54
```

-----Generating Data-----

100%|██████████| 10/10 [00:00<00:00, 1309.86it/s]

-----Finished-----

-----Begin Training-----

10it [00:27, 2.79s/it]

Epoch 1, Epoch loss: total 17914.921875, pixel 0.328373, grad 7.823923, laplacian 0.015306, dIdt 17906.754297

Epoch 1, Epoch SSIM: pixel 0.245742, grad 0.073634, laplacian 0.384855, dIdt 0.000910

10it [00:28, 2.84s/it]

Epoch 2, Epoch loss: total 17893.713477, pixel 0.361053, grad 7.823536, laplacian 0.015315, dIdt 17885.513770

Epoch 2, Epoch SSIM: pixel 0.251569, grad 0.075022, laplacian 0.369189, dIdt 0.000269

10it [00:28, 2.86s/it]

Epoch 3, Epoch loss: total 17872.010449, pixel 0.405366, grad 7.823641, laplacian 0.015332, dIdt 17863.766309

Epoch 3, Epoch SSIM: pixel 0.243153, grad 0.075124, laplacian 0.343494, dIdt 0.000145

10it [00:28, 2.85s/it]

Epoch 4, Epoch loss: total 17849.216211, pixel 0.462844, grad 7.824319, laplacian 0.015359, dIdt 17840.913574

Epoch 4, Epoch SSIM: pixel 0.229702, grad 0.074076, laplacian 0.311549, dIdt 0.000095

10it [00:28, 2.83s/it]

Epoch 5, Epoch loss: total 17824.729492, pixel 0.535244, grad 7.825708, laplacian 0.015394, dIdt 17816.353125

Epoch 5, Epoch SSIM: pixel 0.214545, grad 0.072122, laplacian 0.280802, dIdt 0.000069

10it [00:28, 2.86s/it]

```
Epoch 6, Epoch loss: total 17797.961914, pixel 0.624381, grad 7.827927, laplacian 0.015442, dIdt 17789.494141
Epoch 6, Epoch SSIM: pixel 0.199355, grad 0.069514, laplacian 0.254725, dIdt 0.000053
10it [00:28, 2.84s/it]
Epoch 7, Epoch loss: total 17768.336523, pixel 0.733835, grad 7.831100, laplacian 0.015507, dIdt 17759.756152
Epoch 7, Epoch SSIM: pixel 0.184922, grad 0.066512, laplacian 0.230018, dIdt 0.000043
10it [00:28, 2.84s/it]
Epoch 8, Epoch loss: total 17735.191504, pixel 0.868539, grad 7.835425, laplacian 0.015597, dIdt 17726.471973
Epoch 8, Epoch SSIM: pixel 0.171307, grad 0.063319, laplacian 0.204915, dIdt 0.000036
10it [00:28, 2.86s/it]
Epoch 9, Epoch loss: total 17697.864160, pixel 1.032466, grad 7.841093, laplacian 0.015723, dIdt 17688.975000
Epoch 9, Epoch SSIM: pixel 0.158767, grad 0.060073, laplacian 0.179756, dIdt 0.000032
10it [00:31, 3.15s/it]
Epoch 10, Epoch loss: total 17655.743945, pixel 1.227561, grad 7.848367, laplacian 0.015896, dIdt 17646.651855
Epoch 10, Epoch SSIM: pixel 0.147485, grad 0.056863, laplacian 0.157536, dIdt 0.000030
10it [00:28, 2.84s/it]
Epoch 11, Epoch loss: total 17608.286719, pixel 1.454749, grad 7.857451, laplacian 0.016116, dIdt 17598.958691
Epoch 11, Epoch SSIM: pixel 0.137267, grad 0.053753, laplacian 0.140268, dIdt 0.000031
10it [00:28, 2.87s/it]
Epoch 12, Epoch loss: total 17554.968066, pixel 1.713222, grad 7.868519, laplacian 0.016376, dIdt 17545.369629
Epoch 12, Epoch SSIM: pixel 0.126742, grad 0.050794, laplacian 0.126917, dIdt 0.000033
10it [00:28, 2.87s/it]
Epoch 13, Epoch loss: total 17495.195410, pixel 2.002803, grad 7.881932, laplacian 0.016680, dIdt 17485.293945
Epoch 13, Epoch SSIM: pixel 0.114688, grad 0.048009, laplacian 0.115163, dIdt 0.000036
10it [00:28, 2.84s/it]
Epoch 14, Epoch loss: total 17428.324512, pixel 2.328624, grad 7.898037, laplacian 0.017052, dIdt 17418.080762
Epoch 14, Epoch SSIM: pixel 0.101797, grad 0.045413, laplacian 0.104521, dIdt 0.000042
10it [00:28, 2.84s/it]
Epoch 15, Epoch loss: total 17353.772949, pixel 2.700754, grad 7.916953, laplacian 0.017519, dIdt 17343.137695
Epoch 15, Epoch SSIM: pixel 0.088417, grad 0.043037, laplacian 0.093733, dIdt 0.000049
10it [00:28, 2.84s/it]
Epoch 16, Epoch loss: total 17271.032910, pixel 3.132453, grad 7.938567, laplacian 0.018096, dIdt 17259.943945
Epoch 16, Epoch SSIM: pixel 0.073339, grad 0.040903, laplacian 0.083902, dIdt 0.000059
10it [00:28, 2.88s/it]
```

```
Epoch 17, Epoch loss: total 17179.705762, pixel 3.649111, grad 7.962657, lapla
cian 0.018807, dIdt 17168.075293
Epoch 17, Epoch SSIM: pixel 0.062350, grad 0.039014, laplacian 0.074712, dIdt
0.000072
10it [00:28, 2.84s/it]
Epoch 18, Epoch loss: total 17079.598145, pixel 4.297895, grad 7.988769, lapla
cian 0.019708, dIdt 17067.291504
Epoch 18, Epoch SSIM: pixel 0.054166, grad 0.037365, laplacian 0.067190, dIdt
0.000087
10it [00:28, 2.86s/it]
Epoch 19, Epoch loss: total 16970.539746, pixel 5.116725, grad 8.016360, lapla
cian 0.020838, dIdt 16957.385742
Epoch 19, Epoch SSIM: pixel 0.043642, grad 0.035938, laplacian 0.060705, dIdt
0.000106
10it [00:31, 3.15s/it]
Epoch 20, Epoch loss: total 16852.560156, pixel 6.141965, grad 8.044872, lapla
cian 0.022238, dIdt 16838.350879
Epoch 20, Epoch SSIM: pixel 0.035406, grad 0.034711, laplacian 0.055316, dIdt
0.000129
10it [00:28, 2.88s/it]
Epoch 21, Epoch loss: total 16725.884375, pixel 7.398488, grad 8.073575, lapla
cian 0.023928, dIdt 16710.388086
Epoch 21, Epoch SSIM: pixel 0.031825, grad 0.033660, laplacian 0.049624, dIdt
0.000156
10it [00:28, 2.84s/it]
Epoch 22, Epoch loss: total 16590.891602, pixel 8.911892, grad 8.101572, lapla
cian 0.025912, dIdt 16573.852246
Epoch 22, Epoch SSIM: pixel 0.030114, grad 0.032773, laplacian 0.045460, dIdt
0.000188
10it [00:28, 2.85s/it]
Epoch 23, Epoch loss: total 16448.231836, pixel 10.724130, grad 8.127653, lapl
acian 0.028196, dIdt 16429.351855
Epoch 23, Epoch SSIM: pixel 0.028218, grad 0.032046, laplacian 0.041064, dIdt
0.000225
10it [00:28, 2.83s/it]
Epoch 24, Epoch loss: total 16298.869141, pixel 12.913545, grad 8.150436, lapl
acian 0.030812, dIdt 16277.774414
Epoch 24, Epoch SSIM: pixel 0.024372, grad 0.031481, laplacian 0.036766, dIdt
0.000267
10it [00:28, 2.86s/it]
Epoch 25, Epoch loss: total 16143.776270, pixel 15.526716, grad 8.168750, lapl
acian 0.033761, dIdt 16120.047070
Epoch 25, Epoch SSIM: pixel 0.018647, grad 0.031073, laplacian 0.033705, dIdt
0.000315
10it [00:28, 2.87s/it]
Epoch 26, Epoch loss: total 15984.082422, pixel 18.611850, grad 8.181779, lapl
acian 0.037026, dIdt 15957.251855
Epoch 26, Epoch SSIM: pixel 0.012422, grad 0.030815, laplacian 0.031140, dIdt
0.000369
10it [00:28, 2.84s/it]
Epoch 27, Epoch loss: total 15821.069238, pixel 22.211356, grad 8.189286, lapl
acian 0.040623, dIdt 15790.628027
Epoch 27, Epoch SSIM: pixel 0.007385, grad 0.030698, laplacian 0.028781, dIdt
0.000428
10it [00:28, 2.83s/it]
```

```
Epoch 28, Epoch loss: total 15655.909863, pixel 26.325176, grad 8.191467, laplacian 0.044485, dIdt 15621.348926
Epoch 28, Epoch SSIM: pixel 0.003758, grad 0.030707, laplacian 0.026768, dIdt 0.000493
10it [00:28, 2.83s/it]
Epoch 29, Epoch loss: total 15489.739844, pixel 30.944120, grad 8.188525, laplacian 0.048591, dIdt 15450.558691
Epoch 29, Epoch SSIM: pixel 0.001064, grad 0.030837, laplacian 0.024918, dIdt 0.000564
10it [00:31, 3.18s/it]
Epoch 30, Epoch loss: total 15323.774902, pixel 36.088213, grad 8.181282, laplacian 0.052967, dIdt 15279.452637
Epoch 30, Epoch SSIM: pixel -0.001040, grad 0.031076, laplacian 0.023634, dIdt 0.000639
10it [00:28, 2.86s/it]
Epoch 31, Epoch loss: total 15159.212305, pixel 41.791011, grad 8.171005, laplacian 0.057619, dIdt 15109.192676
Epoch 31, Epoch SSIM: pixel -0.002745, grad 0.031406, laplacian 0.022692, dIdt 0.000720
10it [00:28, 2.84s/it]
Epoch 32, Epoch loss: total 14997.167187, pixel 48.086547, grad 8.159212, laplacian 0.062545, dIdt 14940.858887
Epoch 32, Epoch SSIM: pixel -0.003927, grad 0.031801, laplacian 0.021904, dIdt 0.000805
10it [00:28, 2.83s/it]
Epoch 33, Epoch loss: total 14838.586719, pixel 54.980596, grad 8.147733, laplacian 0.067712, dIdt 14775.390723
Epoch 33, Epoch SSIM: pixel -0.004719, grad 0.032227, laplacian 0.021109, dIdt 0.000895
10it [00:28, 2.86s/it]
Epoch 34, Epoch loss: total 14684.299512, pixel 62.460956, grad 8.138525, laplacian 0.073101, dIdt 14613.626758
Epoch 34, Epoch SSIM: pixel -0.005179, grad 0.032636, laplacian 0.020362, dIdt 0.000987
10it [00:28, 2.84s/it]
Epoch 35, Epoch loss: total 14535.008984, pixel 70.503520, grad 8.133252, laplacian 0.078703, dIdt 14456.293457
Epoch 35, Epoch SSIM: pixel -0.005450, grad 0.032976, laplacian 0.019317, dIdt 0.001083
10it [00:28, 2.84s/it]
Epoch 36, Epoch loss: total 14391.350684, pixel 79.080706, grad 8.133286, laplacian 0.084536, dIdt 14304.052051
Epoch 36, Epoch SSIM: pixel -0.005560, grad 0.033199, laplacian 0.017709, dIdt 0.001181
10it [00:28, 2.83s/it]
Epoch 37, Epoch loss: total 14253.863184, pixel 88.172190, grad 8.140044, laplacian 0.090573, dIdt 14157.460156
Epoch 37, Epoch SSIM: pixel -0.005627, grad 0.033246, laplacian 0.016088, dIdt 0.001281
10it [00:28, 2.85s/it]
Epoch 38, Epoch loss: total 14123.001855, pixel 97.761364, grad 8.154699, laplacian 0.096828, dIdt 14016.989063
Epoch 38, Epoch SSIM: pixel -0.005514, grad 0.033073, laplacian 0.014636, dIdt 0.001381
10it [00:28, 2.84s/it]
```

```
Epoch 39, Epoch loss: total 13999.099219, pixel 107.808462, grad 8.178106, lap  
lacian 0.103283, dIdt 13883.009375  
Epoch 39, Epoch SSIM: pixel -0.005485, grad 0.032661, laplacian 0.013300, dIdt  
0.001483  
10it [00:31, 3.16s/it]  
Epoch 40, Epoch loss: total 13882.361914, pixel 118.264324, grad 8.211051, lap  
lacian 0.109903, dIdt 13755.776562  
Epoch 40, Epoch SSIM: pixel -0.005384, grad 0.032019, laplacian 0.012319, dIdt  
0.001584  
10it [00:28, 2.84s/it]  
Epoch 41, Epoch loss: total 13772.921973, pixel 129.089789, grad 8.254196, lap  
lacian 0.116686, dIdt 13635.461230  
Epoch 41, Epoch SSIM: pixel -0.005178, grad 0.031186, laplacian 0.011159, dIdt  
0.001685  
10it [00:28, 2.88s/it]  
Epoch 42, Epoch loss: total 13670.734766, pixel 140.212302, grad 8.307921, lap  
lacian 0.123601, dIdt 13522.090918  
Epoch 42, Epoch SSIM: pixel -0.005141, grad 0.030222, laplacian 0.010230, dIdt  
0.001784  
10it [00:28, 2.83s/it]  
Epoch 43, Epoch loss: total 13575.783105, pixel 151.562932, grad 8.372630, lap  
lacian 0.130641, dIdt 13415.716797  
Epoch 43, Epoch SSIM: pixel -0.005094, grad 0.029184, laplacian 0.009442, dIdt  
0.001882  
10it [00:28, 2.84s/it]  
Epoch 44, Epoch loss: total 13487.955957, pixel 163.077916, grad 8.448604, lap  
lacian 0.137802, dIdt 13316.291504  
Epoch 44, Epoch SSIM: pixel -0.004577, grad 0.028121, laplacian 0.008987, dIdt  
0.001972  
10it [00:28, 2.84s/it]  
Epoch 45, Epoch loss: total 13407.068359, pixel 174.693118, grad 8.535890, lap  
lacian 0.145040, dIdt 13223.694336  
Epoch 45, Epoch SSIM: pixel -0.004721, grad 0.027072, laplacian 0.008735, dIdt  
0.002072  
10it [00:28, 2.83s/it]  
Epoch 46, Epoch loss: total 13332.899902, pixel 186.339678, grad 8.634190, lap  
lacian 0.152354, dIdt 13137.773535  
Epoch 46, Epoch SSIM: pixel -0.003735, grad 0.026064, laplacian 0.008409, dIdt  
0.002164  
10it [00:29, 2.90s/it]  
Epoch 47, Epoch loss: total 13265.244922, pixel 197.989416, grad 8.742944, lap  
lacian 0.159727, dIdt 13058.352930  
Epoch 47, Epoch SSIM: pixel -0.003311, grad 0.025112, laplacian 0.008063, dIdt  
0.002252  
10it [00:28, 2.84s/it]  
Epoch 48, Epoch loss: total 13203.763770, pixel 209.598011, grad 8.861632, lap  
lacian 0.167123, dIdt 12985.137109  
Epoch 48, Epoch SSIM: pixel -0.002217, grad 0.024224, laplacian 0.007849, dIdt  
0.002337  
10it [00:28, 2.85s/it]  
Epoch 49, Epoch loss: total 13148.103320, pixel 221.117847, grad 8.989660, lap  
lacian 0.174516, dIdt 12917.821387  
Epoch 49, Epoch SSIM: pixel -0.000053, grad 0.023399, laplacian 0.007813, dIdt  
0.002419  
10it [00:31, 3.15s/it]
```

```
Epoch 50, Epoch loss: total 13097.881445, pixel 232.493686, grad 9.126675, lap  
lacian 0.181871, dIdt 12856.079395  
Epoch 50, Epoch SSIM: pixel 0.001856, grad 0.022635, laplacian 0.007841, dIdt  
0.002497  
10it [00:28, 2.84s/it]  
Epoch 51, Epoch loss: total 13052.716504, pixel 243.671024, grad 9.272366, lap  
lacian 0.189151, dIdt 12799.583887  
Epoch 51, Epoch SSIM: pixel 0.004078, grad 0.021926, laplacian 0.007732, dIdt  
0.002572  
10it [00:28, 2.83s/it]  
Epoch 52, Epoch loss: total 13012.219434, pixel 254.588034, grad 9.426320, lap  
lacian 0.196339, dIdt 12748.008594  
Epoch 52, Epoch SSIM: pixel 0.006521, grad 0.021268, laplacian 0.007472, dIdt  
0.002644  
10it [00:28, 2.86s/it]  
Epoch 53, Epoch loss: total 12976.043262, pixel 265.210086, grad 9.587360, lap  
lacian 0.203418, dIdt 12701.042187  
Epoch 53, Epoch SSIM: pixel 0.008624, grad 0.020659, laplacian 0.007061, dIdt  
0.002711  
10it [00:28, 2.84s/it]  
Epoch 54, Epoch loss: total 12943.820117, pixel 275.508110, grad 9.754287, lap  
lacian 0.210353, dIdt 12658.347168  
Epoch 54, Epoch SSIM: pixel 0.009911, grad 0.020096, laplacian 0.006773, dIdt  
0.002776  
10it [00:28, 2.85s/it]  
Epoch 55, Epoch loss: total 12915.147754, pixel 285.432955, grad 9.926096, lap  
lacian 0.217127, dIdt 12619.571484  
Epoch 55, Epoch SSIM: pixel 0.011180, grad 0.019576, laplacian 0.006609, dIdt  
0.002836  
10it [00:28, 2.86s/it]  
Epoch 56, Epoch loss: total 12889.575586, pixel 294.869762, grad 10.102216, la  
placian 0.223697, dIdt 12584.379883  
Epoch 56, Epoch SSIM: pixel 0.011844, grad 0.019095, laplacian 0.006465, dIdt  
0.002893  
10it [00:28, 2.83s/it]  
Epoch 57, Epoch loss: total 12866.961230, pixel 303.847456, grad 10.282167, la  
placian 0.230098, dIdt 12552.601465  
Epoch 57, Epoch SSIM: pixel 0.012134, grad 0.018647, laplacian 0.006295, dIdt  
0.002947  
10it [00:28, 2.82s/it]  
Epoch 58, Epoch loss: total 12847.010547, pixel 312.403469, grad 10.465555, la  
placian 0.236333, dIdt 12523.905078  
Epoch 58, Epoch SSIM: pixel 0.014152, grad 0.018230, laplacian 0.006054, dIdt  
0.002997  
10it [00:28, 2.83s/it]  
Epoch 59, Epoch loss: total 12829.369238, pixel 320.534798, grad 10.651839, la  
placian 0.242361, dIdt 12497.940137  
Epoch 59, Epoch SSIM: pixel 0.012320, grad 0.017840, laplacian 0.005848, dIdt  
0.003044  
10it [00:31, 3.15s/it]  
Epoch 60, Epoch loss: total 12813.740234, pixel 328.227210, grad 10.840331, la  
placian 0.248175, dIdt 12474.424512  
Epoch 60, Epoch SSIM: pixel 0.012024, grad 0.017477, laplacian 0.005670, dIdt  
0.003088  
10it [00:28, 2.84s/it]
```

```
Epoch 61, Epoch loss: total 12799.873730, pixel 335.469429, grad 11.030294, la  
placian 0.253761, dIdt 12453.120410  
Epoch 61, Epoch SSIM: pixel 0.011757, grad 0.017138, laplacian 0.005569, dIdt  
0.003129  
10it [00:28, 2.86s/it]  
Epoch 62, Epoch loss: total 12787.549023, pixel 342.259245, grad 11.221272, la  
placian 0.259124, dIdt 12433.809570  
Epoch 62, Epoch SSIM: pixel 0.011463, grad 0.016820, laplacian 0.005592, dIdt  
0.003167  
10it [00:28, 2.85s/it]  
Epoch 63, Epoch loss: total 12776.568359, pixel 348.601061, grad 11.412977, la  
placian 0.264264, dIdt 12416.290039  
Epoch 63, Epoch SSIM: pixel 0.011102, grad 0.016523, laplacian 0.005604, dIdt  
0.003203  
10it [00:28, 2.84s/it]  
Epoch 64, Epoch loss: total 12766.748828, pixel 354.501382, grad 11.605222, la  
placian 0.269197, dIdt 12400.372949  
Epoch 64, Epoch SSIM: pixel 0.010492, grad 0.016243, laplacian 0.005623, dIdt  
0.003236  
10it [00:28, 2.84s/it]  
Epoch 65, Epoch loss: total 12757.930371, pixel 359.969480, grad 11.797714, la  
placian 0.273917, dIdt 12385.889160  
Epoch 65, Epoch SSIM: pixel 0.010408, grad 0.015979, laplacian 0.005580, dIdt  
0.003266  
10it [00:28, 2.86s/it]  
Epoch 66, Epoch loss: total 12749.966309, pixel 365.011073, grad 11.990076, la  
placian 0.278430, dIdt 12372.686719  
Epoch 66, Epoch SSIM: pixel 0.010143, grad 0.015730, laplacian 0.005505, dIdt  
0.003295  
10it [00:28, 2.86s/it]  
Epoch 67, Epoch loss: total 12742.728906, pixel 369.632684, grad 12.181752, la  
placian 0.282742, dIdt 12360.631641  
Epoch 67, Epoch SSIM: pixel 0.009496, grad 0.015495, laplacian 0.005445, dIdt  
0.003321  
10it [00:28, 2.88s/it]  
Epoch 68, Epoch loss: total 12736.117871, pixel 373.848070, grad 12.372054, la  
placian 0.286849, dIdt 12349.610937  
Epoch 68, Epoch SSIM: pixel 0.009390, grad 0.015274, laplacian 0.005483, dIdt  
0.003346  
10it [00:28, 2.87s/it]  
Epoch 69, Epoch loss: total 12730.049121, pixel 377.675234, grad 12.561023, la  
placian 0.290770, dIdt 12339.522168  
Epoch 69, Epoch SSIM: pixel 0.008973, grad 0.015065, laplacian 0.005563, dIdt  
0.003369  
10it [00:31, 3.15s/it]  
Epoch 70, Epoch loss: total 12724.462109, pixel 381.153790, grad 12.749026, la  
placian 0.294519, dIdt 12330.264844  
Epoch 70, Epoch SSIM: pixel 0.008829, grad 0.014867, laplacian 0.005630, dIdt  
0.003389  
10it [00:28, 2.84s/it]  
Epoch 71, Epoch loss: total 12719.274609, pixel 384.312140, grad 12.936450, la  
placian 0.298105, dIdt 12321.727832  
Epoch 71, Epoch SSIM: pixel 0.008393, grad 0.014678, laplacian 0.005716, dIdt  
0.003409  
10it [00:28, 2.83s/it]
```

```
Epoch 72, Epoch loss: total 12714.410840, pixel 387.165888, grad 13.123386, la  
placian 0.301539, dIdt 12313.819922  
Epoch 72, Epoch SSIM: pixel 0.008409, grad 0.014497, laplacian 0.005734, dIdt  
0.003427  
10it [00:28, 2.84s/it]  
Epoch 73, Epoch loss: total 12709.809180, pixel 389.721984, grad 13.309595, la  
placian 0.304806, dIdt 12306.472754  
Epoch 73, Epoch SSIM: pixel 0.008005, grad 0.014325, laplacian 0.005692, dIdt  
0.003444  
10it [00:28, 2.80s/it]  
Epoch 74, Epoch loss: total 12705.457910, pixel 392.017178, grad 13.494436, la  
placian 0.307925, dIdt 12299.638379  
Epoch 74, Epoch SSIM: pixel 0.007998, grad 0.014160, laplacian 0.005592, dIdt  
0.003459  
10it [00:28, 2.82s/it]  
Epoch 75, Epoch loss: total 12701.288281, pixel 394.046901, grad 13.677598, la  
placian 0.310890, dIdt 12293.252734  
Epoch 75, Epoch SSIM: pixel 0.007810, grad 0.014004, laplacian 0.005563, dIdt  
0.003474  
10it [00:28, 2.85s/it]  
Epoch 76, Epoch loss: total 12697.275488, pixel 395.816637, grad 13.858778, la  
placian 0.313711, dIdt 12287.286426  
Epoch 76, Epoch SSIM: pixel 0.007453, grad 0.013854, laplacian 0.005604, dIdt  
0.003487  
10it [00:28, 2.80s/it]  
Epoch 77, Epoch loss: total 12693.403418, pixel 397.339405, grad 14.037768, la  
placian 0.316403, dIdt 12281.709961  
Epoch 77, Epoch SSIM: pixel 0.007422, grad 0.013712, laplacian 0.005623, dIdt  
0.003500  
10it [00:28, 2.81s/it]  
Epoch 78, Epoch loss: total 12689.657812, pixel 398.633187, grad 14.214413, la  
placian 0.318973, dIdt 12276.491211  
Epoch 78, Epoch SSIM: pixel 0.007632, grad 0.013576, laplacian 0.005633, dIdt  
0.003511  
10it [00:28, 2.81s/it]  
Epoch 79, Epoch loss: total 12686.024219, pixel 399.719844, grad 14.388507, la  
placian 0.321411, dIdt 12271.594434  
Epoch 79, Epoch SSIM: pixel 0.007304, grad 0.013446, laplacian 0.005645, dIdt  
0.003522  
10it [00:31, 3.13s/it]  
Epoch 80, Epoch loss: total 12682.493652, pixel 400.625469, grad 14.559764, la  
placian 0.323720, dIdt 12266.984668  
Epoch 80, Epoch SSIM: pixel 0.007159, grad 0.013323, laplacian 0.005674, dIdt  
0.003532  
-----Finished-----  
-----Generating Data-----  
100%|██████████| 10/10 [00:00<00:00, 1251.17it/s]  
-----Finished-----
```

```

10it [00:18,  1.83s/it]
ffmpeg version 4.1.9-0+deb10u1 Copyright (c) 2000-2022 the FFmpeg developers
  built with gcc 8 (Debian 8.3.0-6)
  configuration: --prefix=/usr --extra-version=0+deb10u1 --toolchain=hardened
  --libdir=/usr/lib/x86_64-linux-gnu --incdir=/usr/include/x86_64-linux-gnu --arch=amd64 --enable-gpl --disable-stripping --enable-avresample --disable-filter=resample --enable-avisynth --enable-gnutls --enable-ladspa --enable-libaom --enable-libass --enable-libbluray --enable-libbs2b --enable-libcaca --enable-libcdio --enable-libcodec2 --enable-libflite --enable-libfontconfig --enable-libfreetype --enable-libfribidi --enable-libgme --enable-libgsm --enable-libjack --enable-libmp3lame --enable-libmysofa --enable-libopenjpeg --enable-libopenmp3 --enable-libopus --enable-libpulse --enable-librsvg --enable-librubberband --enable-libshine --enable-libsنappy --enable-libsoxr --enable-libspeex --enable-libssh --enable-libtheora --enable-libtwolame --enable-libvidstab --enable-libvorbis --enable-libvpx --enable-libwavpack --enable-libwebp --enable-libx265 --enable-libxml2 --enable-libxvid --enable-libzmq --enable-libzvbi --enable-lv2 --enable-omx --enable-openal --enable-opengl --enable-sdl2 --enable-libdc1394 --enable-libdrm --enable-libiec61883 --enable-chromaprint --enable-frei0r --enable-libx264 --enable-shared
  libavutil      56. 22.100 / 56. 22.100
  libavcodec     58. 35.100 / 58. 35.100
  libavformat    58. 20.100 / 58. 20.100
  libavdevice     58.  5.100 / 58.  5.100
  libavfilter     7. 40.101 /  7. 40.101
  libavresample    4.  0.  0 /  4.  0.  0
  libswscale       5.  3.100 /  5.  3.100
  libswresample    3.  3.100 /  3.  3.100
  libpostproc     55.  3.100 / 55.  3.100
Input #0, image2, from 'tmp/file%02d.png':
  Duration: 00:00:05.00, start: 0.000000, bitrate: N/A
    Stream #0:0: Video: png, rgba(pc), 1296x432 [SAR 2835:2835 DAR 3:1], 2 fps, 2 tbr, 2 tbn, 2 tbc
    Stream mapping:
      Stream #0:0 -> #0:0 (png (native) -> h264 (libx264))
Press [q] to stop, [?] for help
[libx264 @ 0x55b379ad8f00] using SAR=1/1
[libx264 @ 0x55b379ad8f00] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2 AVX FMA3 BMI2 AVX2
[libx264 @ 0x55b379ad8f00] profile High, level 3.1
[libx264 @ 0x55b379ad8f00] 264 - core 155 r2917 0a84d98 - H.264/MPEG-4 AVC codec - Copyleft 2003-2018 - http://www.videolan.org/x264.html - options: cabac=1 ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00:0.00 mixed_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast_pskip=1 chroma_qp_offset=-2 threads=3 lookahead_threads=1 sliced_threads=0 nr=0 decimate=1 interlaced=0 bluray_compat=0 constrained_intra=0 bframes=3 b_pyramid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 keyint_min=25 scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=2.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ratio=1.40 aq=1:1.00
Output #0, mp4, to '/home/jupyter/videos/runs/cameraman/experiments/elu_uniform_lr_1e-05_video.mp4':
  Metadata:
    encoder : Lavf58.20.100
  Stream #0:0: Video: h264 (libx264) (avc1 / 0x31637661), yuv420p, 1296x432 [SAR 1:1 DAR 3:1], q=-1--1, 30 fps, 15360 tbn, 30 tbc
  Metadata:
    encoder : Lavc58.35.100 libx264
  Side data:
    cpb: bitrate max/min/avg: 0/0/0 buffer size: 0 vbv_delay: -1
    frame= 150 fps= 92 q=-1.0 Lsize=      155kB time=00:00:04.90 bitrate= 259.7kbit/s dup=140 drop=0 speed=   3x

```

```
video:153kB audio:0kB subtitle:0kB other streams:0kB global headers:0kB muxing overhead: 1.695359%
[libx264 @ 0x55b379ad8f00] frame I:1      Avg QP:18.98  size: 40196
[libx264 @ 0x55b379ad8f00] frame P:38     Avg QP:18.81  size: 2809
[libx264 @ 0x55b379ad8f00] frame B:111    Avg QP:14.90  size:     79
[libx264 @ 0x55b379ad8f00] consecutive B-frames: 1.3% 0.0% 0.0% 98.7%
[libx264 @ 0x55b379ad8f00] mb I  I16..4: 44.3% 32.9% 22.8%
[libx264 @ 0x55b379ad8f00] mb P  I16..4: 1.2% 0.7% 0.2%  P16..4: 4.9% 1.3% 1.0% 0.0% 0.0%  skip:90.7%
[libx264 @ 0x55b379ad8f00] mb B  I16..4: 0.1% 0.0% 0.0%  B16..8: 2.6% 0.0% 0.0%  direct: 0.0%  skip:97.3%  L0:44.1%  L1:55.8%  BI: 0.1%
[libx264 @ 0x55b379ad8f00] 8x8 transform intra:31.5% inter:62.5%
[libx264 @ 0x55b379ad8f00] coded y,uvDC,uvAC intra: 26.2% 50.5% 32.0% inter: 0.7% 1.1% 0.5%
[libx264 @ 0x55b379ad8f00] i16 v,h,dc,p: 36% 23% 6% 35%
[libx264 @ 0x55b379ad8f00] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 33% 15% 30% 5% 2% 2% 3% 8%
[libx264 @ 0x55b379ad8f00] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 30% 29% 19% 5% 3% 3% 4% 3% 4%
[libx264 @ 0x55b379ad8f00] i8c dc,h,v,p: 45% 20% 11% 23%
[libx264 @ 0x55b379ad8f00] Weighted P-Frames: Y:0.0% UV:0.0%
[libx264 @ 0x55b379ad8f00] ref P L0: 80.8% 12.7% 5.8% 0.7%
[libx264 @ 0x55b379ad8f00] ref B L0: 75.3% 24.3% 0.4%
[libx264 @ 0x55b379ad8f00] ref B L1: 97.8% 2.2%
[libx264 @ 0x55b379ad8f00] kb/s:249.18
```

-----Generating Data-----

100%|██████████| 10/10 [00:00<00:00, 1282.23it/s]

-----Finished-----

-----Begin Training-----

10it [00:27, 2.78s/it]

Epoch 1, Epoch loss: total 17945.103027, pixel 0.771775, grad 7.836600, laplacian 0.015439, dIdt 17936.479102

Epoch 1, Epoch SSIM: pixel -0.103785, grad 0.047544, laplacian 0.215269, dIdt 0.002656

10it [00:28, 2.80s/it]

Epoch 2, Epoch loss: total 17942.992188, pixel 0.767353, grad 7.836583, laplacian 0.015439, dIdt 17934.372754

Epoch 2, Epoch SSIM: pixel -0.104417, grad 0.047107, laplacian 0.215098, dIdt 0.004125

10it [00:28, 2.82s/it]

Epoch 3, Epoch loss: total 17940.876953, pixel 0.763097, grad 7.836565, laplacian 0.015440, dIdt 17932.262012

Epoch 3, Epoch SSIM: pixel -0.105044, grad 0.046684, laplacian 0.214820, dIdt 0.007153

10it [00:28, 2.87s/it]

Epoch 4, Epoch loss: total 17938.755859, pixel 0.758975, grad 7.836549, laplacian 0.015440, dIdt 17930.145020

Epoch 4, Epoch SSIM: pixel -0.105665, grad 0.046284, laplacian 0.214563, dIdt 0.014828

10it [00:28, 2.82s/it]

Epoch 5, Epoch loss: total 17936.630273, pixel 0.755009, grad 7.836533, laplacian 0.015440, dIdt 17928.023535

Epoch 5, Epoch SSIM: pixel -0.106279, grad 0.045910, laplacian 0.214315, dIdt 0.041936

10it [00:28, 2.81s/it]

```
Epoch 6, Epoch loss: total 17934.499414, pixel 0.751209, grad 7.836518, laplacian 0.015441, dIdt 17925.896387
Epoch 6, Epoch SSIM: pixel -0.106881, grad 0.045566, laplacian 0.214092, dIdt 0.123039
10it [00:28, 2.82s/it]
Epoch 7, Epoch loss: total 17932.364551, pixel 0.747568, grad 7.836504, laplacian 0.015441, dIdt 17923.765039
Epoch 7, Epoch SSIM: pixel -0.107472, grad 0.045254, laplacian 0.213892, dIdt 0.081321
10it [00:28, 2.81s/it]
Epoch 8, Epoch loss: total 17930.225488, pixel 0.744068, grad 7.836491, laplacian 0.015442, dIdt 17921.629688
Epoch 8, Epoch SSIM: pixel -0.108058, grad 0.044976, laplacian 0.213690, dIdt 0.024837
10it [00:28, 2.83s/it]
Epoch 9, Epoch loss: total 17928.080566, pixel 0.740693, grad 7.836479, laplacian 0.015442, dIdt 17919.488281
Epoch 9, Epoch SSIM: pixel -0.108639, grad 0.044734, laplacian 0.213491, dIdt 0.010599
10it [00:31, 3.11s/it]
Epoch 10, Epoch loss: total 17925.930957, pixel 0.737429, grad 7.836469, laplacian 0.015443, dIdt 17917.341504
Epoch 10, Epoch SSIM: pixel -0.109222, grad 0.044533, laplacian 0.213320, dIdt 0.005770
10it [00:28, 2.82s/it]
Epoch 11, Epoch loss: total 17923.774414, pixel 0.734268, grad 7.836461, laplacian 0.015443, dIdt 17915.188281
Epoch 11, Epoch SSIM: pixel -0.109805, grad 0.044374, laplacian 0.213157, dIdt 0.003616
10it [00:28, 2.83s/it]
Epoch 12, Epoch loss: total 17921.611621, pixel 0.731205, grad 7.836455, laplacian 0.015444, dIdt 17913.028516
Epoch 12, Epoch SSIM: pixel -0.110388, grad 0.044261, laplacian 0.213013, dIdt 0.002481
10it [00:28, 2.83s/it]
Epoch 13, Epoch loss: total 17919.441406, pixel 0.728236, grad 7.836451, laplacian 0.015444, dIdt 17910.861230
Epoch 13, Epoch SSIM: pixel -0.110971, grad 0.044195, laplacian 0.212868, dIdt 0.001812
10it [00:28, 2.82s/it]
Epoch 14, Epoch loss: total 17917.262305, pixel 0.725359, grad 7.836451, laplacian 0.015445, dIdt 17908.685059
Epoch 14, Epoch SSIM: pixel -0.111552, grad 0.044179, laplacian 0.212700, dIdt 0.001387
10it [00:28, 2.81s/it]
Epoch 15, Epoch loss: total 17915.074316, pixel 0.722567, grad 7.836453, laplacian 0.015445, dIdt 17906.499707
Epoch 15, Epoch SSIM: pixel -0.112136, grad 0.044213, laplacian 0.212547, dIdt 0.001099
10it [00:28, 2.82s/it]
Epoch 16, Epoch loss: total 17912.877441, pixel 0.719858, grad 7.836459, laplacian 0.015446, dIdt 17904.305762
Epoch 16, Epoch SSIM: pixel -0.112722, grad 0.044297, laplacian 0.212381, dIdt 0.000896
10it [00:28, 2.85s/it]
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Epoch 17, Epoch loss: total 17910.668848, pixel 0.717224, grad 7.836469, lapla
cian 0.015447, dIdt 17902.099512
Epoch 17, Epoch SSIM: pixel -0.113313, grad 0.044431, laplacian 0.212244, dIdt
0.000747
10it [00:28, 2.81s/it]
Epoch 18, Epoch loss: total 17908.448437, pixel 0.714660, grad 7.836482, lapla
cian 0.015448, dIdt 17899.881934
Epoch 18, Epoch SSIM: pixel -0.113907, grad 0.044614, laplacian 0.212121, dIdt
0.000634
10it [00:28, 2.83s/it]
Epoch 19, Epoch loss: total 17906.215430, pixel 0.712161, grad 7.836498, lapla
cian 0.015449, dIdt 17897.651270
Epoch 19, Epoch SSIM: pixel -0.114507, grad 0.044844, laplacian 0.212015, dIdt
0.000547
10it [00:31, 3.12s/it]
Epoch 20, Epoch loss: total 17903.970117, pixel 0.709719, grad 7.836519, lapla
cian 0.015450, dIdt 17895.408203
Epoch 20, Epoch SSIM: pixel -0.115117, grad 0.045119, laplacian 0.211969, dIdt
0.000478
10it [00:28, 2.86s/it]
Epoch 21, Epoch loss: total 17901.711426, pixel 0.707327, grad 7.836542, lapla
cian 0.015451, dIdt 17893.151758
Epoch 21, Epoch SSIM: pixel -0.115731, grad 0.045437, laplacian 0.211982, dIdt
0.000422
10it [00:28, 2.82s/it]
Epoch 22, Epoch loss: total 17899.437988, pixel 0.704981, grad 7.836570, lapla
cian 0.015452, dIdt 17890.881055
Epoch 22, Epoch SSIM: pixel -0.116354, grad 0.045796, laplacian 0.212063, dIdt
0.000376
10it [00:28, 2.82s/it]
Epoch 23, Epoch loss: total 17897.150098, pixel 0.702674, grad 7.836600, lapla
cian 0.015453, dIdt 17888.595410
Epoch 23, Epoch SSIM: pixel -0.116986, grad 0.046193, laplacian 0.212164, dIdt
0.000338
10it [00:28, 2.81s/it]
Epoch 24, Epoch loss: total 17894.845215, pixel 0.700405, grad 7.836635, lapla
cian 0.015454, dIdt 17886.292676
Epoch 24, Epoch SSIM: pixel -0.117626, grad 0.046626, laplacian 0.212304, dIdt
0.000307
10it [00:28, 2.80s/it]
Epoch 25, Epoch loss: total 17892.524707, pixel 0.698174, grad 7.836672, lapla
cian 0.015455, dIdt 17883.974219
Epoch 25, Epoch SSIM: pixel -0.118277, grad 0.047092, laplacian 0.212463, dIdt
0.000280
10it [00:28, 2.83s/it]
Epoch 26, Epoch loss: total 17890.188379, pixel 0.695988, grad 7.836712, lapla
cian 0.015457, dIdt 17881.640039
Epoch 26, Epoch SSIM: pixel -0.118938, grad 0.047587, laplacian 0.212689, dIdt
0.000256
10it [00:28, 2.81s/it]
Epoch 27, Epoch loss: total 17887.834863, pixel 0.693845, grad 7.836755, lapla
cian 0.015458, dIdt 17879.288867
Epoch 27, Epoch SSIM: pixel -0.119604, grad 0.048109, laplacian 0.212911, dIdt
0.000236
10it [00:28, 2.83s/it]
```

```
Epoch 28, Epoch loss: total 17885.463281, pixel 0.691747, grad 7.836800, lapla
cian 0.015459, dIdt 17876.919531
Epoch 28, Epoch SSIM: pixel -0.120279, grad 0.048655, laplacian 0.213119, dIdt
0.000219
10it [00:28, 2.83s/it]
Epoch 29, Epoch loss: total 17883.074219, pixel 0.689690, grad 7.836847, lapla
cian 0.015460, dIdt 17874.532520
Epoch 29, Epoch SSIM: pixel -0.120961, grad 0.049221, laplacian 0.213329, dIdt
0.000203
10it [00:31, 3.15s/it]
Epoch 30, Epoch loss: total 17880.666699, pixel 0.687672, grad 7.836896, lapla
cian 0.015461, dIdt 17872.126758
Epoch 30, Epoch SSIM: pixel -0.121651, grad 0.049807, laplacian 0.213524, dIdt
0.000190
10it [00:28, 2.83s/it]
Epoch 31, Epoch loss: total 17878.238574, pixel 0.685694, grad 7.836948, lapla
cian 0.015462, dIdt 17869.700488
Epoch 31, Epoch SSIM: pixel -0.122352, grad 0.050408, laplacian 0.213714, dIdt
0.000178
10it [00:28, 2.84s/it]
Epoch 32, Epoch loss: total 17875.790430, pixel 0.683753, grad 7.837002, lapla
cian 0.015464, dIdt 17867.254297
Epoch 32, Epoch SSIM: pixel -0.123060, grad 0.051023, laplacian 0.213873, dIdt
0.000167
10it [00:28, 2.80s/it]
Epoch 33, Epoch loss: total 17873.321777, pixel 0.681847, grad 7.837058, lapla
cian 0.015465, dIdt 17864.787500
Epoch 33, Epoch SSIM: pixel -0.123777, grad 0.051650, laplacian 0.214056, dIdt
0.000157
10it [00:28, 2.85s/it]
Epoch 34, Epoch loss: total 17870.831445, pixel 0.679979, grad 7.837116, lapla
cian 0.015466, dIdt 17862.298633
Epoch 34, Epoch SSIM: pixel -0.124501, grad 0.052287, laplacian 0.214200, dIdt
0.000148
10it [00:28, 2.86s/it]
Epoch 35, Epoch loss: total 17868.319336, pixel 0.678148, grad 7.837177, lapla
cian 0.015468, dIdt 17859.788477
Epoch 35, Epoch SSIM: pixel -0.125231, grad 0.052933, laplacian 0.214347, dIdt
0.000140
10it [00:28, 2.83s/it]
Epoch 36, Epoch loss: total 17865.783301, pixel 0.676355, grad 7.837240, lapla
cian 0.015469, dIdt 17857.254004
Epoch 36, Epoch SSIM: pixel -0.125967, grad 0.053584, laplacian 0.214522, dIdt
0.000133
10it [00:28, 2.82s/it]
Epoch 37, Epoch loss: total 17863.225488, pixel 0.674596, grad 7.837304, lapla
cian 0.015471, dIdt 17854.698047
Epoch 37, Epoch SSIM: pixel -0.126709, grad 0.054241, laplacian 0.214817, dIdt
0.000126
10it [00:28, 2.84s/it]
Epoch 38, Epoch loss: total 17860.641406, pixel 0.672875, grad 7.837371, lapla
cian 0.015472, dIdt 17852.115820
Epoch 38, Epoch SSIM: pixel -0.127457, grad 0.054901, laplacian 0.215163, dIdt
0.000120
10it [00:28, 2.87s/it]
```

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Epoch 39, Epoch loss: total 17858.035254, pixel 0.671194, grad 7.837439, lapla  
cian 0.015474, dIdt 17849.511133  
Epoch 39, Epoch SSIM: pixel -0.128209, grad 0.055563, laplacian 0.215634, dIdt  
0.000114  
10it [00:31, 3.13s/it]  
Epoch 40, Epoch loss: total 17855.401660, pixel 0.669553, grad 7.837510, lapla  
cian 0.015475, dIdt 17846.879102  
Epoch 40, Epoch SSIM: pixel -0.128964, grad 0.056226, laplacian 0.216195, dIdt  
0.000109  
10it [00:28, 2.81s/it]  
Epoch 41, Epoch loss: total 17852.743359, pixel 0.667955, grad 7.837581, lapla  
cian 0.015477, dIdt 17844.222461  
Epoch 41, Epoch SSIM: pixel -0.129719, grad 0.056888, laplacian 0.216912, dIdt  
0.000104  
10it [00:28, 2.81s/it]  
Epoch 42, Epoch loss: total 17850.059277, pixel 0.666399, grad 7.837655, lapla  
cian 0.015478, dIdt 17841.539746  
Epoch 42, Epoch SSIM: pixel -0.130473, grad 0.057548, laplacian 0.217761, dIdt  
0.000100  
10it [00:28, 2.86s/it]  
Epoch 43, Epoch loss: total 17847.347754, pixel 0.664891, grad 7.837730, lapla  
cian 0.015480, dIdt 17838.829785  
Epoch 43, Epoch SSIM: pixel -0.131223, grad 0.058205, laplacian 0.218790, dIdt  
0.000096  
10it [00:28, 2.82s/it]  
Epoch 44, Epoch loss: total 17844.609668, pixel 0.663433, grad 7.837808, lapla  
cian 0.015481, dIdt 17836.093066  
Epoch 44, Epoch SSIM: pixel -0.131967, grad 0.058859, laplacian 0.219965, dIdt  
0.000092  
10it [00:28, 2.85s/it]  
Epoch 45, Epoch loss: total 17841.844336, pixel 0.662035, grad 7.837887, lapla  
cian 0.015482, dIdt 17833.328906  
Epoch 45, Epoch SSIM: pixel -0.132701, grad 0.059509, laplacian 0.221254, dIdt  
0.000088  
10it [00:28, 2.81s/it]  
Epoch 46, Epoch loss: total 17839.050098, pixel 0.660702, grad 7.837969, lapla  
cian 0.015484, dIdt 17830.535742  
Epoch 46, Epoch SSIM: pixel -0.133419, grad 0.060154, laplacian 0.222631, dIdt  
0.000085  
10it [00:28, 2.81s/it]  
Epoch 47, Epoch loss: total 17836.226562, pixel 0.659440, grad 7.838053, lapla  
cian 0.015485, dIdt 17827.713672  
Epoch 47, Epoch SSIM: pixel -0.134122, grad 0.060792, laplacian 0.224105, dIdt  
0.000081  
10it [00:28, 2.84s/it]  
Epoch 48, Epoch loss: total 17833.375684, pixel 0.658256, grad 7.838140, lapla  
cian 0.015487, dIdt 17824.863867  
Epoch 48, Epoch SSIM: pixel -0.134799, grad 0.061424, laplacian 0.225680, dIdt  
0.000078  
10it [00:28, 2.81s/it]  
Epoch 49, Epoch loss: total 17830.494531, pixel 0.657157, grad 7.838230, lapla  
cian 0.015488, dIdt 17821.983691  
Epoch 49, Epoch SSIM: pixel -0.135449, grad 0.062049, laplacian 0.227332, dIdt  
0.000076  
10it [00:31, 3.12s/it]
```

```
Epoch 50, Epoch loss: total 17827.583496, pixel 0.656149, grad 7.838322, lapla
cian 0.015489, dIdt 17819.073437
Epoch 50, Epoch SSIM: pixel -0.136064, grad 0.062664, laplacian 0.229030, dIdt
0.000073
10it [00:28, 2.84s/it]
Epoch 51, Epoch loss: total 17824.641602, pixel 0.655241, grad 7.838418, lapla
cian 0.015491, dIdt 17816.132520
Epoch 51, Epoch SSIM: pixel -0.136639, grad 0.063271, laplacian 0.230778, dIdt
0.000070
10it [00:28, 2.81s/it]
Epoch 52, Epoch loss: total 17821.669043, pixel 0.654438, grad 7.838517, lapla
cian 0.015492, dIdt 17813.160645
Epoch 52, Epoch SSIM: pixel -0.137168, grad 0.063867, laplacian 0.232605, dIdt
0.000068
10it [00:28, 2.82s/it]
Epoch 53, Epoch loss: total 17818.664941, pixel 0.653745, grad 7.838620, lapla
cian 0.015494, dIdt 17810.157129
Epoch 53, Epoch SSIM: pixel -0.137644, grad 0.064452, laplacian 0.234430, dIdt
0.000066
10it [00:28, 2.82s/it]
Epoch 54, Epoch loss: total 17815.629688, pixel 0.653168, grad 7.838727, lapla
cian 0.015495, dIdt 17807.122070
Epoch 54, Epoch SSIM: pixel -0.138059, grad 0.065026, laplacian 0.236293, dIdt
0.000064
10it [00:28, 2.81s/it]
Epoch 55, Epoch loss: total 17812.560449, pixel 0.652709, grad 7.838837, lapla
cian 0.015496, dIdt 17804.053613
Epoch 55, Epoch SSIM: pixel -0.138402, grad 0.065589, laplacian 0.238214, dIdt
0.000062
10it [00:28, 2.86s/it]
Epoch 56, Epoch loss: total 17809.459668, pixel 0.652371, grad 7.838951, lapla
cian 0.015498, dIdt 17800.952930
Epoch 56, Epoch SSIM: pixel -0.138665, grad 0.066138, laplacian 0.240084, dIdt
0.000060
10it [00:28, 2.81s/it]
Epoch 57, Epoch loss: total 17806.325781, pixel 0.652153, grad 7.839068, lapla
cian 0.015500, dIdt 17797.818848
Epoch 57, Epoch SSIM: pixel -0.138838, grad 0.066674, laplacian 0.242040, dIdt
0.000058
10it [00:28, 2.82s/it]
Epoch 58, Epoch loss: total 17803.157520, pixel 0.652054, grad 7.839190, lapla
cian 0.015502, dIdt 17794.650684
Epoch 58, Epoch SSIM: pixel -0.138908, grad 0.067196, laplacian 0.243927, dIdt
0.000056
10it [00:28, 2.81s/it]
Epoch 59, Epoch loss: total 17799.954590, pixel 0.652070, grad 7.839315, lapla
cian 0.015503, dIdt 17791.447656
Epoch 59, Epoch SSIM: pixel -0.138863, grad 0.067704, laplacian 0.245758, dIdt
0.000055
10it [00:31, 3.19s/it]
Epoch 60, Epoch loss: total 17796.717871, pixel 0.652195, grad 7.839443, lapla
cian 0.015505, dIdt 17788.210742
Epoch 60, Epoch SSIM: pixel -0.138689, grad 0.068197, laplacian 0.247468, dIdt
0.000053
10it [00:28, 2.81s/it]
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```
Epoch 61, Epoch loss: total 17793.444922, pixel 0.652426, grad 7.839576, lapla  
cian 0.015507, dIdt 17784.937305  
Epoch 61, Epoch SSIM: pixel -0.138368, grad 0.068675, laplacian 0.249169, dIdt  
0.000052  
10it [00:28, 2.80s/it]  
Epoch 62, Epoch loss: total 17790.137012, pixel 0.652760, grad 7.839712, lapla  
cian 0.015510, dIdt 17781.629297  
Epoch 62, Epoch SSIM: pixel -0.137885, grad 0.069138, laplacian 0.250773, dIdt  
0.000050  
10it [00:28, 2.83s/it]  
Epoch 63, Epoch loss: total 17786.794238, pixel 0.653199, grad 7.839851, lapla  
cian 0.015512, dIdt 17778.285449  
Epoch 63, Epoch SSIM: pixel -0.137220, grad 0.069585, laplacian 0.252228, dIdt  
0.000049  
10it [00:28, 2.89s/it]  
Epoch 64, Epoch loss: total 17783.413477, pixel 0.653747, grad 7.839995, lapla  
cian 0.015515, dIdt 17774.904297  
Epoch 64, Epoch SSIM: pixel -0.136354, grad 0.070017, laplacian 0.253635, dIdt  
0.000048  
10it [00:28, 2.82s/it]  
Epoch 65, Epoch loss: total 17779.996875, pixel 0.654410, grad 7.840142, lapla  
cian 0.015517, dIdt 17771.486719  
Epoch 65, Epoch SSIM: pixel -0.135268, grad 0.070433, laplacian 0.254963, dIdt  
0.000047  
10it [00:28, 2.82s/it]  
Epoch 66, Epoch loss: total 17776.542480, pixel 0.655196, grad 7.840294, lapla  
cian 0.015520, dIdt 17768.031543  
Epoch 66, Epoch SSIM: pixel -0.133947, grad 0.070834, laplacian 0.256093, dIdt  
0.000046  
10it [00:28, 2.82s/it]  
Epoch 67, Epoch loss: total 17773.050098, pixel 0.656115, grad 7.840449, lapla  
cian 0.015523, dIdt 17764.537793  
Epoch 67, Epoch SSIM: pixel -0.132374, grad 0.071219, laplacian 0.257050, dIdt  
0.000044  
10it [00:28, 2.86s/it]  
Epoch 68, Epoch loss: total 17769.519141, pixel 0.657177, grad 7.840609, lapla  
cian 0.015526, dIdt 17761.005957  
Epoch 68, Epoch SSIM: pixel -0.130545, grad 0.071587, laplacian 0.257778, dIdt  
0.000043  
10it [00:28, 2.81s/it]  
Epoch 69, Epoch loss: total 17765.950195, pixel 0.658388, grad 7.840773, lapla  
cian 0.015529, dIdt 17757.435449  
Epoch 69, Epoch SSIM: pixel -0.128463, grad 0.071940, laplacian 0.258306, dIdt  
0.000043  
10it [00:31, 3.13s/it]  
Epoch 70, Epoch loss: total 17762.341113, pixel 0.659757, grad 7.840941, lapla  
cian 0.015532, dIdt 17753.824805  
Epoch 70, Epoch SSIM: pixel -0.126102, grad 0.072276, laplacian 0.258574, dIdt  
0.000042  
10it [00:28, 2.81s/it]  
Epoch 71, Epoch loss: total 17758.692383, pixel 0.661294, grad 7.841113, lapla  
cian 0.015535, dIdt 17750.174414  
Epoch 71, Epoch SSIM: pixel -0.123389, grad 0.072595, laplacian 0.258585, dIdt  
0.000041  
10it [00:28, 2.82s/it]
```

```
Epoch 72, Epoch loss: total 17755.002734, pixel 0.663007, grad 7.841289, lapla  
cian 0.015539, dIdt 17746.482910  
Epoch 72, Epoch SSIM: pixel -0.120346, grad 0.072897, laplacian 0.258363, dIdt  
0.000040  
10it [00:28, 2.81s/it]  
Epoch 73, Epoch loss: total 17751.273145, pixel 0.664905, grad 7.841470, lapla  
cian 0.015543, dIdt 17742.751074  
Epoch 73, Epoch SSIM: pixel -0.117014, grad 0.073182, laplacian 0.257992, dIdt  
0.000039  
10it [00:28, 2.82s/it]  
Epoch 74, Epoch loss: total 17747.502051, pixel 0.666992, grad 7.841654, lapla  
cian 0.015547, dIdt 17738.977930  
Epoch 74, Epoch SSIM: pixel -0.113441, grad 0.073449, laplacian 0.257433, dIdt  
0.000038  
10it [00:28, 2.81s/it]  
Epoch 75, Epoch loss: total 17743.688086, pixel 0.669272, grad 7.841844, lapla  
cian 0.015552, dIdt 17735.161523  
Epoch 75, Epoch SSIM: pixel -0.109649, grad 0.073699, laplacian 0.256703, dIdt  
0.000038  
10it [00:28, 2.81s/it]  
Epoch 76, Epoch loss: total 17739.832617, pixel 0.671747, grad 7.842037, lapla  
cian 0.015556, dIdt 17731.303418  
Epoch 76, Epoch SSIM: pixel -0.105679, grad 0.073932, laplacian 0.255801, dIdt  
0.000037  
10it [00:28, 2.87s/it]  
Epoch 77, Epoch loss: total 17735.935156, pixel 0.674419, grad 7.842235, lapla  
cian 0.015561, dIdt 17727.403027  
Epoch 77, Epoch SSIM: pixel -0.101588, grad 0.074146, laplacian 0.254802, dIdt  
0.000037  
10it [00:28, 2.80s/it]  
Epoch 78, Epoch loss: total 17731.993164, pixel 0.677285, grad 7.842437, lapla  
cian 0.015566, dIdt 17723.458008  
Epoch 78, Epoch SSIM: pixel -0.097436, grad 0.074343, laplacian 0.253718, dIdt  
0.000036  
10it [00:28, 2.80s/it]  
Epoch 79, Epoch loss: total 17728.008203, pixel 0.680345, grad 7.842644, lapla  
cian 0.015571, dIdt 17719.469629  
Epoch 79, Epoch SSIM: pixel -0.093285, grad 0.074523, laplacian 0.252600, dIdt  
0.000035  
10it [00:31, 3.12s/it]  
Epoch 80, Epoch loss: total 17723.979102, pixel 0.683599, grad 7.842856, lapla  
cian 0.015576, dIdt 17715.436816  
Epoch 80, Epoch SSIM: pixel -0.089153, grad 0.074685, laplacian 0.251391, dIdt  
0.000035  
-----Finished-----  
-----Generating Data-----  
100%|██████████| 10/10 [00:00<00:00, 1253.49it/s]  
-----Finished-----
```

```

10it [00:18,  1.84s/it]
ffmpeg version 4.1.9-0+deb10u1 Copyright (c) 2000-2022 the FFmpeg developers
  built with gcc 8 (Debian 8.3.0-6)
  configuration: --prefix=/usr --extra-version=0+deb10u1 --toolchain=hardened
  --libdir=/usr/lib/x86_64-linux-gnu --incdir=/usr/include/x86_64-linux-gnu --arch=amd64 --enable-gpl --disable-stripping --enable-avresample --disable-filter=resample --enable-avisynth --enable-gnutls --enable-ladspa --enable-libaom --enable-libass --enable-libbluray --enable-libbs2b --enable-libcaca --enable-libcdio --enable-libcodec2 --enable-libflite --enable-libfontconfig --enable-libfreetype --enable-libfribidi --enable-libgme --enable-libgsm --enable-libjack --enable-libmp3lame --enable-libmysofa --enable-libopenjpeg --enable-libopenmp3 --enable-libopus --enable-libpulse --enable-librsvg --enable-librubberband --enable-libshine --enable-libsنappy --enable-libsoxr --enable-libspeex --enable-libssh --enable-libtheora --enable-libtwolame --enable-libvidstab --enable-libvorbis --enable-libvpx --enable-libwavpack --enable-libwebp --enable-libx265 --enable-libxml2 --enable-libxvid --enable-libzmq --enable-libzvbi --enable-lv2 --enable-omx --enable-openal --enable-opengl --enable-sdl2 --enable-libdc1394 --enable-libdrm --enable-libiec61883 --enable-chromaprint --enable-frei0r --enable-libx264 --enable-shared
  libavutil      56. 22.100 / 56. 22.100
  libavcodec     58. 35.100 / 58. 35.100
  libavformat    58. 20.100 / 58. 20.100
  libavdevice     58.  5.100 / 58.  5.100
  libavfilter     7. 40.101 /  7. 40.101
  libavresample   4.  0.  0 /  4.  0.  0
  libswscale      5.  3.100 /  5.  3.100
  libswresample   3.  3.100 /  3.  3.100
  libpostproc    55.  3.100 / 55.  3.100
Input #0, image2, from 'tmp/file%02d.png':
  Duration: 00:00:05.00, start: 0.000000, bitrate: N/A
    Stream #0:0: Video: png, rgba(pc), 1296x432 [SAR 2835:2835 DAR 3:1], 2 fps, 2 tbr, 2 tbn, 2 tbc
    Stream mapping:
      Stream #0:0 -> #0:0 (png (native) -> h264 (libx264))
Press [q] to stop, [?] for help
[libx264 @ 0x5593e2af8f00] using SAR=1/1
[libx264 @ 0x5593e2af8f00] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2 AVX FMA3 BMI2 AVX2
[libx264 @ 0x5593e2af8f00] profile High, level 3.1
[libx264 @ 0x5593e2af8f00] 264 - core 155 r2917 0a84d98 - H.264/MPEG-4 AVC codec - Copyleft 2003-2018 - http://www.videolan.org/x264.html - options: cabac=1 ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00:0.00 mixed_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast_pskip=1 chroma_qp_offset=-2 threads=3 lookahead_threads=1 sliced_threads=0 nr=0 decimate=1 interlaced=0 bluray_compat=0 constrained_intra=0 bframes=3 b_pyramid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 keyint_min=25 scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=2.3.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ratio=1.40 aq=1:1.00
Output #0, mp4, to '/home/jupyter/videos/runs/cameraman/experiments/elu_uniform_lr_1e-06_video.mp4':
  Metadata:
    encoder : Lavf58.20.100
  Stream #0:0: Video: h264 (libx264) (avc1 / 0x31637661), yuv420p, 1296x432 [SAR 1:1 DAR 3:1], q=-1--1, 30 fps, 15360 tbn, 30 tbc
  Metadata:
    encoder : Lavc58.35.100 libx264
  Side data:
    cpb: bitrate max/min/avg: 0/0/0 buffer size: 0 vbv_delay: -1
    frame= 150 fps=109 q=-1.0 Lsize= 169kB time=00:00:04.90 bitrate= 282.5kbit/s dup=140 drop=0 speed=3.55x

```

```
video:166kB audio:0kB subtitle:0kB other streams:0kB global headers:0kB muxing overhead: 1.556311%
[libx264 @ 0x5593e2af8f00] frame I:1      Avg QP:18.64  size: 41262
[libx264 @ 0x5593e2af8f00] frame P:38     Avg QP:19.07  size:  3152
[libx264 @ 0x5593e2af8f00] frame B:111    Avg QP:14.98  size:     78
[libx264 @ 0x5593e2af8f00] consecutive B-frames: 1.3% 0.0% 0.0% 98.7%
[libx264 @ 0x5593e2af8f00] mb I  I16..4: 43.6% 32.1% 24.2%
[libx264 @ 0x5593e2af8f00] mb P  I16..4:  0.5%  0.6%  0.3%  P16..4:  5.2%  1.
3% 1.1% 0.0% 0.0%  skip:91.0%
[libx264 @ 0x5593e2af8f00] mb B  I16..4:  0.1%  0.0%  0.0%  B16..8:  2.6%  0.
0% 0.0% direct: 0.0% skip:97.3% L0:44.3% L1:55.6% BI: 0.1%
[libx264 @ 0x5593e2af8f00] 8x8 transform intra:35.4% inter:63.0%
[libx264 @ 0x5593e2af8f00] coded y,uvDC,uvAC intra: 33.7% 43.9% 34.2% inter:
0.7% 1.2% 0.5%
[libx264 @ 0x5593e2af8f00] i16 v,h,dc,p: 56% 19% 7% 17%
[libx264 @ 0x5593e2af8f00] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 35% 10% 27% 3% 6%
5% 5% 3% 5%
[libx264 @ 0x5593e2af8f00] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 31% 23% 17% 4% 5%
5% 5% 3% 5%
[libx264 @ 0x5593e2af8f00] i8c dc,h,v,p: 57% 15% 16% 13%
[libx264 @ 0x5593e2af8f00] Weighted P-Frames: Y:0.0% UV:0.0%
[libx264 @ 0x5593e2af8f00] ref P L0: 80.9% 12.7% 5.9% 0.5%
[libx264 @ 0x5593e2af8f00] ref B L0: 74.5% 25.0% 0.5%
[libx264 @ 0x5593e2af8f00] ref B L1: 98.1% 1.9%
[libx264 @ 0x5593e2af8f00] kb/s:271.54
```

-----Generating Data-----

100%|██████████| 10/10 [00:00<00:00, 1190.95it/s]

-----Finished-----

-----Begin Training-----

10it [00:27, 2.80s/it]

Epoch 1, Epoch loss: total 17927.309570, pixel 0.300997, grad 7.827419, laplacian 0.015345, dIdt 17919.165820

Epoch 1, Epoch SSIM: pixel 0.029847, grad 0.071234, laplacian 0.311277, dIdt 0.016271

10it [00:28, 2.83s/it]

Epoch 2, Epoch loss: total 17927.109668, pixel 0.301015, grad 7.827420, laplacian 0.015345, dIdt 17918.965918

Epoch 2, Epoch SSIM: pixel 0.030857, grad 0.071220, laplacian 0.311061, dIdt 0.015064

10it [00:28, 2.81s/it]

Epoch 3, Epoch loss: total 17926.909473, pixel 0.301033, grad 7.827421, laplacian 0.015345, dIdt 17918.765723

Epoch 3, Epoch SSIM: pixel 0.031843, grad 0.071207, laplacian 0.310866, dIdt 0.013977

10it [00:28, 2.82s/it]

Epoch 4, Epoch loss: total 17926.708301, pixel 0.301053, grad 7.827423, laplacian 0.015345, dIdt 17918.564551

Epoch 4, Epoch SSIM: pixel 0.032834, grad 0.071193, laplacian 0.310665, dIdt 0.012998

10it [00:28, 2.88s/it]

Epoch 5, Epoch loss: total 17926.506152, pixel 0.301073, grad 7.827424, laplacian 0.015345, dIdt 17918.362402

Epoch 5, Epoch SSIM: pixel 0.033833, grad 0.071180, laplacian 0.310458, dIdt 0.012113

10it [00:28, 2.82s/it]

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Epoch 6, Epoch loss: total 17926.303320, pixel 0.301094, grad 7.827425, laplacian 0.015346, dIdt 17918.159570
Epoch 6, Epoch SSIM: pixel 0.034839, grad 0.071166, laplacian 0.310258, dIdt 0.011311
10it [00:28, 2.81s/it]
Epoch 7, Epoch loss: total 17926.100684, pixel 0.301116, grad 7.827426, laplacian 0.015346, dIdt 17917.956934
Epoch 7, Epoch SSIM: pixel 0.035850, grad 0.071153, laplacian 0.310057, dIdt 0.010583
10it [00:28, 2.82s/it]
Epoch 8, Epoch loss: total 17925.897461, pixel 0.301139, grad 7.827427, laplacian 0.015346, dIdt 17917.753613
Epoch 8, Epoch SSIM: pixel 0.036866, grad 0.071139, laplacian 0.309854, dIdt 0.009921
10it [00:28, 2.82s/it]
Epoch 9, Epoch loss: total 17925.694727, pixel 0.301162, grad 7.827429, laplacian 0.015346, dIdt 17917.550781
Epoch 9, Epoch SSIM: pixel 0.037886, grad 0.071126, laplacian 0.309645, dIdt 0.009317
10it [00:31, 3.12s/it]
Epoch 10, Epoch loss: total 17925.491211, pixel 0.301187, grad 7.827430, laplacian 0.015346, dIdt 17917.347266
Epoch 10, Epoch SSIM: pixel 0.038909, grad 0.071112, laplacian 0.309431, dIdt 0.008766
10it [00:28, 2.81s/it]
Epoch 11, Epoch loss: total 17925.287891, pixel 0.301212, grad 7.827431, laplacian 0.015346, dIdt 17917.143945
Epoch 11, Epoch SSIM: pixel 0.039934, grad 0.071098, laplacian 0.309236, dIdt 0.008261
10it [00:28, 2.80s/it]
Epoch 12, Epoch loss: total 17925.084082, pixel 0.301238, grad 7.827432, laplacian 0.015346, dIdt 17916.940137
Epoch 12, Epoch SSIM: pixel 0.040962, grad 0.071085, laplacian 0.309024, dIdt 0.007797
10it [00:28, 2.84s/it]
Epoch 13, Epoch loss: total 17924.880566, pixel 0.301264, grad 7.827434, laplacian 0.015347, dIdt 17916.736621
Epoch 13, Epoch SSIM: pixel 0.041991, grad 0.071071, laplacian 0.308815, dIdt 0.007370
10it [00:28, 2.80s/it]
Epoch 14, Epoch loss: total 17924.676855, pixel 0.301292, grad 7.827435, laplacian 0.015347, dIdt 17916.532910
Epoch 14, Epoch SSIM: pixel 0.043021, grad 0.071057, laplacian 0.308603, dIdt 0.006977
10it [00:28, 2.82s/it]
Epoch 15, Epoch loss: total 17924.472656, pixel 0.301320, grad 7.827436, laplacian 0.015347, dIdt 17916.328711
Epoch 15, Epoch SSIM: pixel 0.044051, grad 0.071044, laplacian 0.308384, dIdt 0.006614
10it [00:28, 2.81s/it]
Epoch 16, Epoch loss: total 17924.268457, pixel 0.301349, grad 7.827438, laplacian 0.015347, dIdt 17916.124414
Epoch 16, Epoch SSIM: pixel 0.045082, grad 0.071030, laplacian 0.308184, dIdt 0.006279
10it [00:28, 2.81s/it]
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Epoch 17, Epoch loss: total 17924.064063, pixel 0.301379, grad 7.827439, lapla
cian 0.015347, dIdt 17915.919824
Epoch 17, Epoch SSIM: pixel 0.046114, grad 0.071016, laplacian 0.307964, dIdt
0.005967
10it [00:28, 2.86s/it]
Epoch 18, Epoch loss: total 17923.860547, pixel 0.301409, grad 7.827440, lapla
cian 0.015347, dIdt 17915.716309
Epoch 18, Epoch SSIM: pixel 0.047145, grad 0.071003, laplacian 0.307748, dIdt
0.005678
10it [00:28, 2.81s/it]
Epoch 19, Epoch loss: total 17923.655762, pixel 0.301441, grad 7.827441, lapla
cian 0.015347, dIdt 17915.511523
Epoch 19, Epoch SSIM: pixel 0.048177, grad 0.070989, laplacian 0.307542, dIdt
0.005410
10it [00:31, 3.12s/it]
Epoch 20, Epoch loss: total 17923.451855, pixel 0.301473, grad 7.827443, lapla
cian 0.015348, dIdt 17915.307520
Epoch 20, Epoch SSIM: pixel 0.049208, grad 0.070976, laplacian 0.307326, dIdt
0.005160
10it [00:28, 2.85s/it]
Epoch 21, Epoch loss: total 17923.246973, pixel 0.301506, grad 7.827444, lapla
cian 0.015348, dIdt 17915.102637
Epoch 21, Epoch SSIM: pixel 0.050238, grad 0.070962, laplacian 0.307125, dIdt
0.004926
10it [00:28, 2.85s/it]
Epoch 22, Epoch loss: total 17923.042773, pixel 0.301539, grad 7.827446, lapla
cian 0.015348, dIdt 17914.898340
Epoch 22, Epoch SSIM: pixel 0.051268, grad 0.070948, laplacian 0.306917, dIdt
0.004709
10it [00:28, 2.82s/it]
Epoch 23, Epoch loss: total 17922.837793, pixel 0.301574, grad 7.827447, lapla
cian 0.015348, dIdt 17914.693359
Epoch 23, Epoch SSIM: pixel 0.052297, grad 0.070935, laplacian 0.306725, dIdt
0.004505
10it [00:28, 2.83s/it]
Epoch 24, Epoch loss: total 17922.632812, pixel 0.301609, grad 7.827448, lapla
cian 0.015348, dIdt 17914.488379
Epoch 24, Epoch SSIM: pixel 0.053324, grad 0.070921, laplacian 0.306513, dIdt
0.004314
10it [00:28, 2.81s/it]
Epoch 25, Epoch loss: total 17922.428711, pixel 0.301644, grad 7.827449, lapla
cian 0.015349, dIdt 17914.284277
Epoch 25, Epoch SSIM: pixel 0.054351, grad 0.070907, laplacian 0.306304, dIdt
0.004135
10it [00:28, 2.80s/it]
Epoch 26, Epoch loss: total 17922.225000, pixel 0.301681, grad 7.827451, lapla
cian 0.015349, dIdt 17914.080566
Epoch 26, Epoch SSIM: pixel 0.055376, grad 0.070894, laplacian 0.306106, dIdt
0.003967
10it [00:28, 2.83s/it]
Epoch 27, Epoch loss: total 17922.019824, pixel 0.301718, grad 7.827452, lapla
cian 0.015349, dIdt 17913.875391
Epoch 27, Epoch SSIM: pixel 0.056400, grad 0.070880, laplacian 0.305896, dIdt
0.003809
10it [00:28, 2.80s/it]
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Epoch 28, Epoch loss: total 17921.814941, pixel 0.301756, grad 7.827453, lapla
cian 0.015349, dIdt 17913.670410
Epoch 28, Epoch SSIM: pixel 0.057422, grad 0.070867, laplacian 0.305678, dIdt
0.003660
10it [00:28, 2.80s/it]
Epoch 29, Epoch loss: total 17921.610059, pixel 0.301795, grad 7.827455, lapla
cian 0.015349, dIdt 17913.465430
Epoch 29, Epoch SSIM: pixel 0.058442, grad 0.070853, laplacian 0.305466, dIdt
0.003520
10it [00:31, 3.14s/it]
Epoch 30, Epoch loss: total 17921.404980, pixel 0.301835, grad 7.827456, lapla
cian 0.015349, dIdt 17913.260254
Epoch 30, Epoch SSIM: pixel 0.059460, grad 0.070840, laplacian 0.305252, dIdt
0.003387
10it [00:28, 2.83s/it]
Epoch 31, Epoch loss: total 17921.199707, pixel 0.301875, grad 7.827457, lapla
cian 0.015350, dIdt 17913.054980
Epoch 31, Epoch SSIM: pixel 0.060476, grad 0.070826, laplacian 0.305032, dIdt
0.003262
10it [00:28, 2.81s/it]
Epoch 32, Epoch loss: total 17920.994922, pixel 0.301916, grad 7.827458, lapla
cian 0.015350, dIdt 17912.850195
Epoch 32, Epoch SSIM: pixel 0.061489, grad 0.070813, laplacian 0.304826, dIdt
0.003144
10it [00:28, 2.80s/it]
Epoch 33, Epoch loss: total 17920.789844, pixel 0.301958, grad 7.827460, lapla
cian 0.015350, dIdt 17912.645117
Epoch 33, Epoch SSIM: pixel 0.062500, grad 0.070799, laplacian 0.304622, dIdt
0.003033
10it [00:28, 2.81s/it]
Epoch 34, Epoch loss: total 17920.584570, pixel 0.302000, grad 7.827461, lapla
cian 0.015350, dIdt 17912.439648
Epoch 34, Epoch SSIM: pixel 0.063508, grad 0.070785, laplacian 0.304422, dIdt
0.002927
10it [00:28, 2.81s/it]
Epoch 35, Epoch loss: total 17920.379297, pixel 0.302043, grad 7.827462, lapla
cian 0.015350, dIdt 17912.234375
Epoch 35, Epoch SSIM: pixel 0.064513, grad 0.070772, laplacian 0.304208, dIdt
0.002827
10it [00:28, 2.81s/it]
Epoch 36, Epoch loss: total 17920.173730, pixel 0.302087, grad 7.827463, lapla
cian 0.015351, dIdt 17912.028809
Epoch 36, Epoch SSIM: pixel 0.065515, grad 0.070758, laplacian 0.303998, dIdt
0.002731
10it [00:28, 2.80s/it]
Epoch 37, Epoch loss: total 17919.968750, pixel 0.302132, grad 7.827465, lapla
cian 0.015351, dIdt 17911.823828
Epoch 37, Epoch SSIM: pixel 0.066514, grad 0.070745, laplacian 0.303787, dIdt
0.002641
10it [00:28, 2.81s/it]
Epoch 38, Epoch loss: total 17919.763086, pixel 0.302178, grad 7.827466, lapla
cian 0.015351, dIdt 17911.618066
Epoch 38, Epoch SSIM: pixel 0.067510, grad 0.070731, laplacian 0.303572, dIdt
0.002555
10it [00:28, 2.85s/it]
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Epoch 39, Epoch loss: total 17919.557910, pixel 0.302224, grad 7.827467, lapla
cian 0.015351, dIdt 17911.412793
Epoch 39, Epoch SSIM: pixel 0.068503, grad 0.070718, laplacian 0.303371, dIdt
0.002474
10it [00:31, 3.13s/it]
Epoch 40, Epoch loss: total 17919.352148, pixel 0.302270, grad 7.827469, lapla
cian 0.015351, dIdt 17911.207031
Epoch 40, Epoch SSIM: pixel 0.069493, grad 0.070705, laplacian 0.303163, dIdt
0.002396
10it [00:28, 2.80s/it]
Epoch 41, Epoch loss: total 17919.146582, pixel 0.302318, grad 7.827470, lapla
cian 0.015351, dIdt 17911.001367
Epoch 41, Epoch SSIM: pixel 0.070480, grad 0.070691, laplacian 0.302945, dIdt
0.002322
10it [00:28, 2.81s/it]
Epoch 42, Epoch loss: total 17918.940723, pixel 0.302366, grad 7.827471, lapla
cian 0.015351, dIdt 17910.795410
Epoch 42, Epoch SSIM: pixel 0.071463, grad 0.070678, laplacian 0.302730, dIdt
0.002251
10it [00:28, 2.83s/it]
Epoch 43, Epoch loss: total 17918.735352, pixel 0.302415, grad 7.827472, lapla
cian 0.015352, dIdt 17910.590039
Epoch 43, Epoch SSIM: pixel 0.072443, grad 0.070664, laplacian 0.302519, dIdt
0.002184
10it [00:28, 2.81s/it]
Epoch 44, Epoch loss: total 17918.529980, pixel 0.302465, grad 7.827473, lapla
cian 0.015352, dIdt 17910.384668
Epoch 44, Epoch SSIM: pixel 0.073420, grad 0.070651, laplacian 0.302297, dIdt
0.002119
10it [00:27, 2.80s/it]
Epoch 45, Epoch loss: total 17918.324316, pixel 0.302515, grad 7.827475, lapla
cian 0.015352, dIdt 17910.178906
Epoch 45, Epoch SSIM: pixel 0.074394, grad 0.070638, laplacian 0.302079, dIdt
0.002058
10it [00:28, 2.81s/it]
Epoch 46, Epoch loss: total 17918.118359, pixel 0.302567, grad 7.827476, lapla
cian 0.015352, dIdt 17909.972949
Epoch 46, Epoch SSIM: pixel 0.075365, grad 0.070624, laplacian 0.301864, dIdt
0.001999
10it [00:28, 2.80s/it]
Epoch 47, Epoch loss: total 17917.911816, pixel 0.302618, grad 7.827477, lapla
cian 0.015352, dIdt 17909.766406
Epoch 47, Epoch SSIM: pixel 0.076332, grad 0.070611, laplacian 0.301653, dIdt
0.001943
10it [00:28, 2.86s/it]
Epoch 48, Epoch loss: total 17917.705859, pixel 0.302671, grad 7.827479, lapla
cian 0.015353, dIdt 17909.560352
Epoch 48, Epoch SSIM: pixel 0.077296, grad 0.070597, laplacian 0.301448, dIdt
0.001889
10it [00:28, 2.82s/it]
Epoch 49, Epoch loss: total 17917.500586, pixel 0.302724, grad 7.827480, lapla
cian 0.015353, dIdt 17909.355078
Epoch 49, Epoch SSIM: pixel 0.078257, grad 0.070584, laplacian 0.301250, dIdt
0.001838
10it [00:31, 3.12s/it]
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Epoch 50, Epoch loss: total 17917.294043, pixel 0.302778, grad 7.827481, lapla
cian 0.015353, dIdt 17909.148535
Epoch 50, Epoch SSIM: pixel 0.079214, grad 0.070571, laplacian 0.301039, dIdt
0.001788
10it [00:28, 2.82s/it]
Epoch 51, Epoch loss: total 17917.088281, pixel 0.302833, grad 7.827482, lapla
cian 0.015353, dIdt 17908.942773
Epoch 51, Epoch SSIM: pixel 0.080168, grad 0.070558, laplacian 0.300825, dIdt
0.001741
10it [00:28, 2.87s/it]
Epoch 52, Epoch loss: total 17916.881836, pixel 0.302888, grad 7.827483, lapla
cian 0.015353, dIdt 17908.736230
Epoch 52, Epoch SSIM: pixel 0.081119, grad 0.070544, laplacian 0.300623, dIdt
0.001695
10it [00:28, 2.81s/it]
Epoch 53, Epoch loss: total 17916.675488, pixel 0.302944, grad 7.827484, lapla
cian 0.015353, dIdt 17908.529785
Epoch 53, Epoch SSIM: pixel 0.082065, grad 0.070531, laplacian 0.300420, dIdt
0.001652
10it [00:28, 2.81s/it]
Epoch 54, Epoch loss: total 17916.468750, pixel 0.303001, grad 7.827486, lapla
cian 0.015354, dIdt 17908.323047
Epoch 54, Epoch SSIM: pixel 0.083009, grad 0.070518, laplacian 0.300218, dIdt
0.001610
10it [00:28, 2.85s/it]
Epoch 55, Epoch loss: total 17916.262402, pixel 0.303059, grad 7.827487, lapla
cian 0.015354, dIdt 17908.116699
Epoch 55, Epoch SSIM: pixel 0.083948, grad 0.070505, laplacian 0.300008, dIdt
0.001570
10it [00:28, 2.86s/it]
Epoch 56, Epoch loss: total 17916.056055, pixel 0.303117, grad 7.827488, lapla
cian 0.015354, dIdt 17907.910156
Epoch 56, Epoch SSIM: pixel 0.084884, grad 0.070491, laplacian 0.299803, dIdt
0.001531
10it [00:28, 2.81s/it]
Epoch 57, Epoch loss: total 17915.849512, pixel 0.303176, grad 7.827489, lapla
cian 0.015354, dIdt 17907.703613
Epoch 57, Epoch SSIM: pixel 0.085816, grad 0.070478, laplacian 0.299592, dIdt
0.001494
10it [00:28, 2.81s/it]
Epoch 58, Epoch loss: total 17915.642578, pixel 0.303235, grad 7.827490, lapla
cian 0.015354, dIdt 17907.496582
Epoch 58, Epoch SSIM: pixel 0.086744, grad 0.070465, laplacian 0.299397, dIdt
0.001458
10it [00:28, 2.81s/it]
Epoch 59, Epoch loss: total 17915.435645, pixel 0.303295, grad 7.827491, lapla
cian 0.015354, dIdt 17907.289648
Epoch 59, Epoch SSIM: pixel 0.087668, grad 0.070452, laplacian 0.299195, dIdt
0.001423
10it [00:31, 3.12s/it]
Epoch 60, Epoch loss: total 17915.228906, pixel 0.303356, grad 7.827493, lapla
cian 0.015355, dIdt 17907.082910
Epoch 60, Epoch SSIM: pixel 0.088588, grad 0.070439, laplacian 0.298988, dIdt
0.001390
10it [00:28, 2.85s/it]
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Epoch 61, Epoch loss: total 17915.021973, pixel 0.303418, grad 7.827494, lapla
cian 0.015355, dIdt 17906.875977
Epoch 61, Epoch SSIM: pixel 0.089504, grad 0.070425, laplacian 0.298779, dIdt
0.001358
10it [00:28, 2.81s/it]
Epoch 62, Epoch loss: total 17914.815430, pixel 0.303480, grad 7.827495, lapla
cian 0.015355, dIdt 17906.669336
Epoch 62, Epoch SSIM: pixel 0.090416, grad 0.070412, laplacian 0.298574, dIdt
0.001327
10it [00:28, 2.82s/it]
Epoch 63, Epoch loss: total 17914.608594, pixel 0.303543, grad 7.827496, lapla
cian 0.015355, dIdt 17906.462109
Epoch 63, Epoch SSIM: pixel 0.091323, grad 0.070399, laplacian 0.298372, dIdt
0.001297
10it [00:28, 2.81s/it]
Epoch 64, Epoch loss: total 17914.400879, pixel 0.303607, grad 7.827497, lapla
cian 0.015355, dIdt 17906.254395
Epoch 64, Epoch SSIM: pixel 0.092227, grad 0.070386, laplacian 0.298175, dIdt
0.001268
10it [00:28, 2.83s/it]
Epoch 65, Epoch loss: total 17914.193750, pixel 0.303672, grad 7.827498, lapla
cian 0.015355, dIdt 17906.047266
Epoch 65, Epoch SSIM: pixel 0.093126, grad 0.070373, laplacian 0.297970, dIdt
0.001241
10it [00:28, 2.81s/it]
Epoch 66, Epoch loss: total 17913.986719, pixel 0.303737, grad 7.827500, lapla
cian 0.015355, dIdt 17905.840234
Epoch 66, Epoch SSIM: pixel 0.094020, grad 0.070360, laplacian 0.297771, dIdt
0.001214
10it [00:28, 2.81s/it]
Epoch 67, Epoch loss: total 17913.779687, pixel 0.303803, grad 7.827501, lapla
cian 0.015356, dIdt 17905.633203
Epoch 67, Epoch SSIM: pixel 0.094910, grad 0.070347, laplacian 0.297577, dIdt
0.001188
10it [00:28, 2.81s/it]
Epoch 68, Epoch loss: total 17913.571875, pixel 0.303869, grad 7.827502, lapla
cian 0.015356, dIdt 17905.425293
Epoch 68, Epoch SSIM: pixel 0.095796, grad 0.070334, laplacian 0.297374, dIdt
0.001163
10it [00:28, 2.82s/it]
Epoch 69, Epoch loss: total 17913.364941, pixel 0.303936, grad 7.827503, lapla
cian 0.015356, dIdt 17905.218262
Epoch 69, Epoch SSIM: pixel 0.096677, grad 0.070320, laplacian 0.297165, dIdt
0.001139
10it [00:31, 3.11s/it]
Epoch 70, Epoch loss: total 17913.157422, pixel 0.304004, grad 7.827504, lapla
cian 0.015356, dIdt 17905.010645
Epoch 70, Epoch SSIM: pixel 0.097553, grad 0.070307, laplacian 0.296971, dIdt
0.001115
10it [00:28, 2.82s/it]
Epoch 71, Epoch loss: total 17912.949707, pixel 0.304073, grad 7.827505, lapla
cian 0.015356, dIdt 17904.802832
Epoch 71, Epoch SSIM: pixel 0.098424, grad 0.070294, laplacian 0.296785, dIdt
0.001093
10it [00:28, 2.83s/it]
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Epoch 72, Epoch loss: total 17912.742480, pixel 0.304142, grad 7.827506, lapla  
cian 0.015357, dIdt 17904.595605  
Epoch 72, Epoch SSIM: pixel 0.099291, grad 0.070281, laplacian 0.296586, dIdt  
0.001071  
10it [00:28, 2.86s/it]  
Epoch 73, Epoch loss: total 17912.535352, pixel 0.304212, grad 7.827507, lapla  
cian 0.015357, dIdt 17904.388379  
Epoch 73, Epoch SSIM: pixel 0.100153, grad 0.070268, laplacian 0.296391, dIdt  
0.001049  
10it [00:28, 2.83s/it]  
Epoch 74, Epoch loss: total 17912.327832, pixel 0.304282, grad 7.827508, lapla  
cian 0.015357, dIdt 17904.180664  
Epoch 74, Epoch SSIM: pixel 0.101010, grad 0.070255, laplacian 0.296190, dIdt  
0.001029  
10it [00:28, 2.81s/it]  
Epoch 75, Epoch loss: total 17912.119922, pixel 0.304353, grad 7.827509, lapla  
cian 0.015357, dIdt 17903.972559  
Epoch 75, Epoch SSIM: pixel 0.101863, grad 0.070242, laplacian 0.295992, dIdt  
0.001009  
10it [00:28, 2.80s/it]  
Epoch 76, Epoch loss: total 17911.912109, pixel 0.304425, grad 7.827510, lapla  
cian 0.015357, dIdt 17903.764648  
Epoch 76, Epoch SSIM: pixel 0.102710, grad 0.070229, laplacian 0.295798, dIdt  
0.000989  
10it [00:28, 2.83s/it]  
Epoch 77, Epoch loss: total 17911.703906, pixel 0.304498, grad 7.827511, lapla  
cian 0.015358, dIdt 17903.556445  
Epoch 77, Epoch SSIM: pixel 0.103552, grad 0.070216, laplacian 0.295601, dIdt  
0.000971  
10it [00:28, 2.87s/it]  
Epoch 78, Epoch loss: total 17911.495801, pixel 0.304571, grad 7.827512, lapla  
cian 0.015358, dIdt 17903.348242  
Epoch 78, Epoch SSIM: pixel 0.104390, grad 0.070204, laplacian 0.295407, dIdt  
0.000952  
10it [00:28, 2.81s/it]  
Epoch 79, Epoch loss: total 17911.287695, pixel 0.304645, grad 7.827513, lapla  
cian 0.015358, dIdt 17903.140039  
Epoch 79, Epoch SSIM: pixel 0.105222, grad 0.070191, laplacian 0.295203, dIdt  
0.000935  
10it [00:31, 3.12s/it]  
Epoch 80, Epoch loss: total 17911.079492, pixel 0.304720, grad 7.827514, lapla  
cian 0.015358, dIdt 17902.931738  
Epoch 80, Epoch SSIM: pixel 0.106049, grad 0.070178, laplacian 0.295005, dIdt  
0.000918  
-----Finished-----  
-----Generating Data-----  
100%|██████████| 10/10 [00:00<00:00, 1095.09it/s]  
-----Finished-----
```

```

10it [00:18,  1.83s/it]
ffmpeg version 4.1.9-0+deb10u1 Copyright (c) 2000-2022 the FFmpeg developers
  built with gcc 8 (Debian 8.3.0-6)
  configuration: --prefix=/usr --extra-version=0+deb10u1 --toolchain=hardened
  --libdir=/usr/lib/x86_64-linux-gnu --incdir=/usr/include/x86_64-linux-gnu --arch=amd64 --enable-gpl --disable-stripping --enable-avresample --disable-filter=resample --enable-avisynth --enable-gnutls --enable-ladspa --enable-libaom --enable-libass --enable-libbluray --enable-libbs2b --enable-libcaca --enable-libcdio --enable-libcodec2 --enable-libflite --enable-libfontconfig --enable-libfreetype --enable-libfribidi --enable-libgme --enable-libgsm --enable-libjack --enable-libmp3lame --enable-libmysofa --enable-libopenjpeg --enable-libopenmp3 --enable-libopus --enable-libpulse --enable-librsvg --enable-librubberband --enable-libshine --enable-libsnappy --enable-libsoxr --enable-libspeex --enable-libssh --enable-libtheora --enable-libtwolame --enable-libvidstab --enable-libvorbis --enable-libvpx --enable-libwavpack --enable-libwebp --enable-libx265 --enable-libxml2 --enable-libxvid --enable-libzmq --enable-libzvbi --enable-lv2 --enable-omx --enable-openal --enable-opengl --enable-sdl2 --enable-libdc1394 --enable-libdrm --enable-libiec61883 --enable-chromaprint --enable-frei0r --enable-libx264 --enable-shared

  libavutil      56. 22.100 / 56. 22.100
  libavcodec     58. 35.100 / 58. 35.100
  libavformat    58. 20.100 / 58. 20.100
  libavdevice     58.  5.100 / 58.  5.100
  libavfilter     7. 40.101 /  7. 40.101
  libavresample    4.  0.  0 /  4.  0.  0
  libswscale       5.  3.100 /  5.  3.100
  libswresample    3.  3.100 /  3.  3.100
  libpostproc     55.  3.100 / 55.  3.100

Input #0, image2, from 'tmp/file%02d.png':
  Duration: 00:00:05.00, start: 0.000000, bitrate: N/A
    Stream #0:0: Video: png, rgba(pc), 1296x432 [SAR 2835:2835 DAR 3:1], 2 fps, 2 tbr, 2 tbn, 2 tbc
    Stream mapping:
      Stream #0:0 -> #0:0 (png (native) -> h264 (libx264))
Press [q] to stop, [?] for help
[libx264 @ 0x55c83f1b1f00] using SAR=1/1
[libx264 @ 0x55c83f1b1f00] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2 AVX FMA3 BMI2 AVX2
[libx264 @ 0x55c83f1b1f00] profile High, level 3.1
[libx264 @ 0x55c83f1b1f00] 264 - core 155 r2917 0a84d98 - H.264/MPEG-4 AVC codec - Copyleft 2003-2018 - http://www.videolan.org/x264.html - options: cabac=1 ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00:0.00 mixed_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast_pskip=1 chroma_qp_offset=-2 threads=3 lookahead_threads=1 sliced_threads=0 nr=0 decimate=1 interlaced=0 bluray_compat=0 constrained_intra=0 bframes=3 b_pyr amid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 keyint_min=25 scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=2.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ratio=1.40 aq=1:1.00
Output #0, mp4, to '/home/jupyter/videos/runs/cameraman/experiments/elu_uniform_lr_1e-07_video.mp4':

  Metadata:
    encoder : Lavf58.20.100
  Stream #0:0: Video: h264 (libx264) (avc1 / 0x31637661), yuv420p, 1296x432 [SAR 1:1 DAR 3:1], q=-1--1, 30 fps, 15360 tbn, 30 tbc
  Metadata:
    encoder : Lavc58.35.100 libx264
  Side data:
    cpb: bitrate max/min/avg: 0/0/0 buffer size: 0 vbv_delay: -1
    frame= 150 fps=108 q=-1.0 Lsize= 165kB time=00:00:04.90 bitrate= 276.3kbit/s dup=140 drop=0 speed=3.54x

```

```
video:163kB audio:0kB subtitle:0kB other streams:0kB global headers:0kB muxing overhead: 1.592267%
[libx264 @ 0x55c83f1b1f00] frame I:1      Avg QP:17.40  size: 42537
[libx264 @ 0x55c83f1b1f00] frame P:38     Avg QP:19.03  size: 3016
[libx264 @ 0x55c83f1b1f00] frame B:111    Avg QP:14.97  size:     79
[libx264 @ 0x55c83f1b1f00] consecutive B-frames: 1.3% 0.0% 0.0% 98.7%
[libx264 @ 0x55c83f1b1f00] mb I  I16..4: 48.1% 27.7% 24.2%
[libx264 @ 0x55c83f1b1f00] mb P  I16..4:  0.6%  0.5%  0.2%  P16..4:  4.9%  1.5%
  1.2% 0.0% 0.0%   skip:91.2%
[libx264 @ 0x55c83f1b1f00] mb B  I16..4:  0.1%  0.0%  0.0%  B16..8:  2.5%  0.0%
  0.0% direct: 0.0% skip:97.4% L0:44.8% L1:55.0% BI: 0.2%
[libx264 @ 0x55c83f1b1f00] 8x8 transform intra:31.0% inter:66.1%
[libx264 @ 0x55c83f1b1f00] coded y,uvDC,uvAC intra: 28.8% 42.3% 31.5% inter:
  0.8% 1.2% 0.6%
[libx264 @ 0x55c83f1b1f00] i16 v,h,dc,p: 52% 23% 9% 17%
[libx264 @ 0x55c83f1b1f00] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 30% 10% 30% 3% 7%
  6% 5% 4%
[libx264 @ 0x55c83f1b1f00] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 29% 26% 18% 4% 5%
  4% 5% 3% 4%
[libx264 @ 0x55c83f1b1f00] i8c dc,h,v,p: 56% 19% 12% 13%
[libx264 @ 0x55c83f1b1f00] Weighted P-Frames: Y:0.0% UV:0.0%
[libx264 @ 0x55c83f1b1f00] ref P L0: 79.8% 13.9% 5.7% 0.6%
[libx264 @ 0x55c83f1b1f00] ref B L0: 73.5% 26.2% 0.3%
[libx264 @ 0x55c83f1b1f00] ref B L1: 98.0% 2.0%
[libx264 @ 0x55c83f1b1f00] kb/s:265.39
```

-----Generating Data-----

100%|██████████| 10/10 [00:00<00:00, 1051.41it/s]

-----Finished-----

-----Begin Training-----

10it [00:28, 2.83s/it]

Epoch 1, Epoch loss: total 17851.765039, pixel 0.410591, grad 7.861281, laplacian 0.015428, dIdt 17843.477539

Epoch 1, Epoch SSIM: pixel 0.003084, grad 0.067732, laplacian 0.254465, dIdt 0.000079

10it [00:27, 2.80s/it]

Epoch 2, Epoch loss: total 17743.646582, pixel 0.495741, grad 7.878972, laplacian 0.015508, dIdt 17735.256250

Epoch 2, Epoch SSIM: pixel 0.021943, grad 0.063283, laplacian 0.225179, dIdt 0.000036

10it [00:28, 2.84s/it]

Epoch 3, Epoch loss: total 17697.892480, pixel 0.558621, grad 7.888798, laplacian 0.015548, dIdt 17689.429395

Epoch 3, Epoch SSIM: pixel 0.021367, grad 0.060703, laplacian 0.215295, dIdt 0.000032

10it [00:28, 2.81s/it]

Epoch 4, Epoch loss: total 17680.175293, pixel 0.586624, grad 7.892958, laplacian 0.015568, dIdt 17671.680078

Epoch 4, Epoch SSIM: pixel 0.021333, grad 0.059665, laplacian 0.210201, dIdt 0.000031

10it [00:28, 2.81s/it]

Epoch 5, Epoch loss: total 17673.741895, pixel 0.597246, grad 7.894518, laplacian 0.015576, dIdt 17665.234473

Epoch 5, Epoch SSIM: pixel 0.021365, grad 0.059287, laplacian 0.208241, dIdt 0.000031

10it [00:29, 2.92s/it]

```
Epoch 6, Epoch loss: total 17671.475879, pixel 0.601041, grad 7.895074, laplacian 0.015578, dIdt 17662.964062
Epoch 6, Epoch SSIM: pixel 0.021377, grad 0.059154, laplacian 0.207581, dIdt 0.000031
10it [00:28, 2.81s/it]
Epoch 7, Epoch loss: total 17670.687695, pixel 0.602368, grad 7.895268, laplacian 0.015579, dIdt 17662.174609
Epoch 7, Epoch SSIM: pixel 0.021380, grad 0.059108, laplacian 0.207362, dIdt 0.000031
10it [00:28, 2.81s/it]
Epoch 8, Epoch loss: total 17670.414844, pixel 0.602829, grad 7.895335, laplacian 0.015579, dIdt 17661.901367
Epoch 8, Epoch SSIM: pixel 0.021380, grad 0.059091, laplacian 0.207289, dIdt 0.000031
10it [00:28, 2.83s/it]
Epoch 9, Epoch loss: total 17670.319922, pixel 0.602989, grad 7.895359, laplacian 0.015579, dIdt 17661.806152
Epoch 9, Epoch SSIM: pixel 0.021380, grad 0.059086, laplacian 0.207265, dIdt 0.000031
10it [00:31, 3.18s/it]
Epoch 10, Epoch loss: total 17670.287305, pixel 0.603045, grad 7.895367, laplacian 0.015580, dIdt 17661.773535
Epoch 10, Epoch SSIM: pixel 0.021381, grad 0.059084, laplacian 0.207254, dIdt 0.000031
10it [00:28, 2.80s/it]
Epoch 11, Epoch loss: total 17670.275977, pixel 0.603063, grad 7.895370, laplacian 0.015580, dIdt 17661.762207
Epoch 11, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt 0.000031
10it [00:28, 2.82s/it]
Epoch 12, Epoch loss: total 17670.274121, pixel 0.603066, grad 7.895370, laplacian 0.015580, dIdt 17661.760352
Epoch 12, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt 0.000031
10it [00:28, 2.81s/it]
Epoch 13, Epoch loss: total 17670.273730, pixel 0.603067, grad 7.895370, laplacian 0.015580, dIdt 17661.759961
Epoch 13, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt 0.000031
10it [00:28, 2.88s/it]
Epoch 14, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, laplacian 0.015580, dIdt 17661.760156
Epoch 14, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt 0.000031
10it [00:28, 2.81s/it]
Epoch 15, Epoch loss: total 17670.273730, pixel 0.603067, grad 7.895370, laplacian 0.015580, dIdt 17661.759961
Epoch 15, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt 0.000031
10it [00:28, 2.83s/it]
Epoch 16, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, laplacian 0.015580, dIdt 17661.760156
Epoch 16, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt 0.000031
10it [00:28, 2.81s/it]
```

```
Epoch 17, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 17, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.86s/it]
Epoch 18, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 18, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.84s/it]
Epoch 19, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 19, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:31, 3.13s/it]
Epoch 20, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 20, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.82s/it]
Epoch 21, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 21, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.83s/it]
Epoch 22, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 22, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.87s/it]
Epoch 23, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 23, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.82s/it]
Epoch 24, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 24, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.81s/it]
Epoch 25, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 25, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.81s/it]
Epoch 26, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 26, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.88s/it]
Epoch 27, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 27, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.85s/it]
```

```
Epoch 28, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 28, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.83s/it]
Epoch 29, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 29, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:31, 3.13s/it]
Epoch 30, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 30, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.89s/it]
Epoch 31, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 31, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.82s/it]
Epoch 32, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 32, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.83s/it]
Epoch 33, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 33, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.82s/it]
Epoch 34, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 34, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.88s/it]
Epoch 35, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 35, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.82s/it]
Epoch 36, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 36, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.82s/it]
Epoch 37, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 37, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.82s/it]
Epoch 38, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 38, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.83s/it]
```

```
Epoch 39, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 39, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:31, 3.18s/it]
Epoch 40, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 40, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.85s/it]
Epoch 41, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 41, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.82s/it]
Epoch 42, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 42, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.82s/it]
Epoch 43, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 43, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.83s/it]
Epoch 44, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 44, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.82s/it]
Epoch 45, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 45, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.81s/it]
Epoch 46, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 46, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.82s/it]
Epoch 47, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 47, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.87s/it]
Epoch 48, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 48, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.80s/it]
Epoch 49, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 49, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:31, 3.15s/it]
```

```
Epoch 50, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 50, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.81s/it]
Epoch 51, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 51, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.86s/it]
Epoch 52, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 52, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.83s/it]
Epoch 53, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 53, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.82s/it]
Epoch 54, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 54, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.81s/it]
Epoch 55, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 55, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.85s/it]
Epoch 56, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 56, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.87s/it]
Epoch 57, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 57, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.82s/it]
Epoch 58, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 58, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.81s/it]
Epoch 59, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 59, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:31, 3.13s/it]
Epoch 60, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla
cian 0.015580, dIdt 17661.760156
Epoch 60, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt
0.000031
10it [00:28, 2.86s/it]
```

```
Epoch 61, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 61, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.81s/it]  
Epoch 62, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 62, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.82s/it]  
Epoch 63, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 63, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.82s/it]  
Epoch 64, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 64, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.87s/it]  
Epoch 65, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 65, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.83s/it]  
Epoch 66, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 66, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.80s/it]  
Epoch 67, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 67, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.82s/it]  
Epoch 68, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 68, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.84s/it]  
Epoch 69, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 69, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:31, 3.18s/it]  
Epoch 70, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 70, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.81s/it]  
Epoch 71, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 71, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.81s/it]
```

```
Epoch 72, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 72, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.82s/it]  
Epoch 73, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 73, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.82s/it]  
Epoch 74, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 74, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.81s/it]  
Epoch 75, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 75, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.81s/it]  
Epoch 76, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 76, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.82s/it]  
Epoch 77, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 77, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.85s/it]  
Epoch 78, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 78, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:28, 2.81s/it]  
Epoch 79, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 79, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
10it [00:31, 3.12s/it]  
Epoch 80, Epoch loss: total 17670.273926, pixel 0.603067, grad 7.895370, lapla  
cian 0.015580, dIdt 17661.760156  
Epoch 80, Epoch SSIM: pixel 0.021380, grad 0.059083, laplacian 0.207251, dIdt  
0.000031  
-----Finished-----  
-----Generating Data-----  
100%|██████████| 10/10 [00:00<00:00, 1393.46it/s]  
-----Finished-----
```

```

10it [00:18,  1.84s/it]
ffmpeg version 4.1.9-0+deb10u1 Copyright (c) 2000-2022 the FFmpeg developers
  built with gcc 8 (Debian 8.3.0-6)
  configuration: --prefix=/usr --extra-version=0+deb10u1 --toolchain=hardened
  --libdir=/usr/lib/x86_64-linux-gnu --incdir=/usr/include/x86_64-linux-gnu --arch=amd64 --enable-gpl --disable-stripping --enable-avresample --disable-filter=resample --enable-avisynth --enable-gnutls --enable-ladspa --enable-libaom --enable-libass --enable-libbluray --enable-libbs2b --enable-libcaca --enable-libcdio --enable-libcodec2 --enable-libflite --enable-libfontconfig --enable-libfreetype --enable-libfribidi --enable-libgme --enable-libgsm --enable-libjack --enable-libmp3lame --enable-libmysofa --enable-libopenjpeg --enable-libopenmp3 --enable-libopus --enable-libpulse --enable-librsvg --enable-librubberband --enable-libshine --enable-libsنappy --enable-libsoxr --enable-libspeex --enable-libssh --enable-libtheora --enable-libtwolame --enable-libvidstab --enable-libvorbis --enable-libvpx --enable-libwavpack --enable-libwebp --enable-libx265 --enable-libxml2 --enable-libxvid --enable-libzmq --enable-libzvbi --enable-lv2 --enable-omx --enable-openal --enable-opengl --enable-sdl2 --enable-libdc1394 --enable-libdrm --enable-libiec61883 --enable-chromaprint --enable-frei0r --enable-libx264 --enable-shared
  libavutil      56. 22.100 / 56. 22.100
  libavcodec     58. 35.100 / 58. 35.100
  libavformat    58. 20.100 / 58. 20.100
  libavdevice     58.  5.100 / 58.  5.100
  libavfilter     7. 40.101 /  7. 40.101
  libavresample   4.  0.  0 /  4.  0.  0
  libswscale      5.  3.100 /  5.  3.100
  libswresample   3.  3.100 /  3.  3.100
  libpostproc    55.  3.100 / 55.  3.100
Input #0, image2, from 'tmp/file%02d.png':
  Duration: 00:00:05.00, start: 0.000000, bitrate: N/A
    Stream #0:0: Video: png, rgba(pc), 1296x432 [SAR 2835:2835 DAR 3:1], 2 fps, 2 tbr, 2 tbn, 2 tbc
    Stream mapping:
      Stream #0:0 -> #0:0 (png (native) -> h264 (libx264))
Press [q] to stop, [?] for help
[libx264 @ 0x564297f6af00] using SAR=1/1
[libx264 @ 0x564297f6af00] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2 AVX FMA3 BMI2 AVX2
[libx264 @ 0x564297f6af00] profile High, level 3.1
[libx264 @ 0x564297f6af00] 264 - core 155 r2917 0a84d98 - H.264/MPEG-4 AVC codec - Copyleft 2003-2018 - http://www.videolan.org/x264.html - options: cabac=1 ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00:0.00 mixed_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast_pskip=1 chroma_qp_offset=-2 threads=3 lookahead_threads=1 sliced_threads=0 nr=0 decimate=1 interlaced=0 bluray_compat=0 constrained_intra=0 bframes=3 b_pyramid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 keyint_min=25 scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=2.3.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ratio=1.40 aq=1:1.00
Output #0, mp4, to '/home/jupyter/videos/runs/cameraman/experiments/elu_decay_exp_le-04_video.mp4':
  Metadata:
    encoder : Lavf58.20.100
  Stream #0:0: Video: h264 (libx264) (avc1 / 0x31637661), yuv420p, 1296x432 [SAR 1:1 DAR 3:1], q=-1--1, 30 fps, 15360 tbn, 30 tbc
  Metadata:
    encoder : Lavc58.35.100 libx264
  Side data:
    cpb: bitrate max/min/avg: 0/0/0 buffer size: 0 vbv_delay: -1
    frame= 150 fps=109 q=-1.0 Lsize= 165kB time=00:00:04.90 bitrate= 276.3kbit/s dup=140 drop=0 speed=3.56x

```

```
video:163kB audio:0kB subtitle:0kB other streams:0kB global headers:0kB muxing overhead: 1.591923%
[libx264 @ 0x564297f6af00] frame I:1      Avg QP:16.76  size: 41552
[libx264 @ 0x564297f6af00] frame P:38     Avg QP:18.94  size: 3052
[libx264 @ 0x564297f6af00] frame B:111    Avg QP:14.61  size:    75
[libx264 @ 0x564297f6af00] consecutive B-frames: 1.3% 0.0% 0.0% 98.7%
[libx264 @ 0x564297f6af00] mb I  I16..4: 51.1% 25.3% 23.6%
[libx264 @ 0x564297f6af00] mb P  I16..4:  0.6%  0.6%  0.3%  P16..4:  5.0%  1.
3% 1.1% 0.0% 0.0%  skip:91.1%
[libx264 @ 0x564297f6af00] mb B  I16..4:  0.1%  0.0%  0.0%  B16..8:  2.6%  0.
0% 0.0% direct: 0.0% skip:97.4% L0:45.1% L1:54.9% BI: 0.1%
[libx264 @ 0x564297f6af00] 8x8 transform intra:29.9% inter:63.3%
[libx264 @ 0x564297f6af00] coded y,uvDC,uvAC intra: 32.7% 45.7% 34.2% inter:
0.7% 1.2% 0.5%
[libx264 @ 0x564297f6af00] i16 v,h,dc,p: 57% 18% 7% 19%
[libx264 @ 0x564297f6af00] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 33% 8% 27% 4% 6%
7% 3% 5%
[libx264 @ 0x564297f6af00] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 30% 24% 18% 6% 4%
5% 4% 4%
[libx264 @ 0x564297f6af00] i8c dc,h,v,p: 53% 15% 17% 15%
[libx264 @ 0x564297f6af00] Weighted P-Frames: Y:0.0% UV:0.0%
[libx264 @ 0x564297f6af00] ref P L0: 80.0% 13.3% 6.0% 0.7%
[libx264 @ 0x564297f6af00] ref B L0: 74.5% 25.2% 0.3%
[libx264 @ 0x564297f6af00] ref B L1: 98.2% 1.8%
[libx264 @ 0x564297f6af00] kb/s:265.44
```

-----Generating Data-----

100%|██████████| 10/10 [00:00<00:00, 1138.18it/s]

-----Finished-----

-----Begin Training-----

10it [00:27, 2.79s/it]

Epoch 1, Epoch loss: total 17933.943066, pixel 0.319763, grad 7.835874, laplacian 0.015331, dIdt 17925.772168

Epoch 1, Epoch SSIM: pixel -0.089385, grad 0.071811, laplacian 0.347548, dIdt 0.094998

10it [00:28, 2.83s/it]

Epoch 2, Epoch loss: total 17926.419336, pixel 0.316758, grad 7.836030, laplacian 0.015339, dIdt 17918.251172

Epoch 2, Epoch SSIM: pixel -0.050082, grad 0.071931, laplacian 0.333071, dIdt 0.006673

10it [00:28, 2.81s/it]

Epoch 3, Epoch loss: total 17910.235352, pixel 0.315336, grad 7.836342, laplacian 0.015354, dIdt 17902.068262

Epoch 3, Epoch SSIM: pixel 0.015549, grad 0.072208, laplacian 0.309418, dIdt 0.000629

10it [00:28, 2.84s/it]

Epoch 4, Epoch loss: total 17884.917383, pixel 0.321859, grad 7.836894, laplacian 0.015382, dIdt 17876.743555

Epoch 4, Epoch SSIM: pixel 0.069798, grad 0.072732, laplacian 0.278328, dIdt 0.000193

10it [00:28, 2.81s/it]

Epoch 5, Epoch loss: total 17848.535840, pixel 0.345085, grad 7.837797, laplacian 0.015441, dIdt 17840.337500

Epoch 5, Epoch SSIM: pixel 0.094835, grad 0.073434, laplacian 0.240941, dIdt 0.000090

10it [00:28, 2.87s/it]

```
Epoch 6, Epoch loss: total 17796.204102, pixel 0.398354, grad 7.839126, laplacian 0.015559, dIdt 17787.950977
Epoch 6, Epoch SSIM: pixel 0.093265, grad 0.073990, laplacian 0.211771, dIdt 0.000050
10it [00:28, 2.83s/it]
Epoch 7, Epoch loss: total 17718.000488, pixel 0.507365, grad 7.840642, laplacian 0.015753, dIdt 17709.636719
Epoch 7, Epoch SSIM: pixel 0.071796, grad 0.074129, laplacian 0.189021, dIdt 0.000033
10it [00:28, 2.81s/it]
Epoch 8, Epoch loss: total 17596.107715, pixel 0.779952, grad 7.841615, laplacian 0.016141, dIdt 17587.469922
Epoch 8, Epoch SSIM: pixel 0.046842, grad 0.073915, laplacian 0.154884, dIdt 0.000030
10it [00:28, 2.81s/it]
Epoch 9, Epoch loss: total 17399.848730, pixel 1.520057, grad 7.840200, laplacian 0.017092, dIdt 17390.471582
Epoch 9, Epoch SSIM: pixel 0.035773, grad 0.073163, laplacian 0.109933, dIdt 0.000044
10it [00:31, 3.15s/it]
Epoch 10, Epoch loss: total 17084.794727, pixel 3.494203, grad 7.834767, laplacian 0.019392, dIdt 17073.446582
Epoch 10, Epoch SSIM: pixel 0.025532, grad 0.063375, laplacian 0.072252, dIdt 0.000086
10it [00:28, 2.82s/it]
Epoch 11, Epoch loss: total 16602.586230, pixel 9.330595, grad 7.836678, laplacian 0.025898, dIdt 16585.393164
Epoch 11, Epoch SSIM: pixel 0.013767, grad 0.071167, laplacian 0.039623, dIdt 0.000186
10it [00:28, 2.81s/it]
Epoch 12, Epoch loss: total 15930.931738, pixel 24.653537, grad 7.892848, laplacian 0.041762, dIdt 15898.343555
Epoch 12, Epoch SSIM: pixel 0.025676, grad 0.057309, laplacian 0.021698, dIdt 0.000390
10it [00:28, 2.81s/it]
Epoch 13, Epoch loss: total 15116.580664, pixel 59.712034, grad 8.095001, laplacian 0.071759, dIdt 15048.701953
Epoch 13, Epoch SSIM: pixel 0.015049, grad 0.036905, laplacian 0.013452, dIdt 0.000754
10it [00:30, 3.05s/it]
Epoch 14, Epoch loss: total 14274.032617, pixel 124.206992, grad 8.570464, laplacian 0.117804, dIdt 14141.137305
Epoch 14, Epoch SSIM: pixel 0.004439, grad 0.026599, laplacian 0.010126, dIdt 0.001301
10it [00:28, 2.82s/it]
Epoch 15, Epoch loss: total 13570.534863, pixel 225.942268, grad 9.452933, laplacian 0.182089, dIdt 13334.957617
Epoch 15, Epoch SSIM: pixel 0.001093, grad 0.020781, laplacian 0.008794, dIdt 0.001984
10it [00:28, 2.80s/it]
Epoch 16, Epoch loss: total 13122.282031, pixel 351.217966, grad 10.846921, laplacian 0.257563, dIdt 12759.959570
Epoch 16, Epoch SSIM: pixel -0.000088, grad 0.017023, laplacian 0.006319, dIdt 0.002678
10it [00:28, 2.81s/it]
```

```
Epoch 17, Epoch loss: total 12916.653906, pixel 458.619163, grad 12.700273, la  
placian 0.327756, dIdt 12445.006738  
Epoch 17, Epoch SSIM: pixel 0.007461, grad 0.014534, laplacian 0.004384, dIdt  
0.003231  
10it [00:28, 2.81s/it]  
Epoch 18, Epoch loss: total 12824.961133, pixel 503.227633, grad 14.706083, la  
placian 0.372563, dIdt 12306.654785  
Epoch 18, Epoch SSIM: pixel 0.006784, grad 0.012906, laplacian 0.004306, dIdt  
0.003552  
10it [00:28, 2.86s/it]  
Epoch 19, Epoch loss: total 12758.174512, pixel 490.543629, grad 16.540688, la  
placian 0.388111, dIdt 12250.701953  
Epoch 19, Epoch SSIM: pixel 0.006004, grad 0.011852, laplacian 0.004436, dIdt  
0.003656  
10it [00:31, 3.13s/it]  
Epoch 20, Epoch loss: total 12707.524414, pixel 457.133164, grad 17.983333, la  
placian 0.384590, dIdt 12232.023242  
Epoch 20, Epoch SSIM: pixel 0.005960, grad 0.011178, laplacian 0.004860, dIdt  
0.003646  
10it [00:28, 2.82s/it]  
Epoch 21, Epoch loss: total 12677.795996, pixel 432.211838, grad 19.032672, la  
placian 0.376484, dIdt 12226.175098  
Epoch 21, Epoch SSIM: pixel 0.003718, grad 0.010760, laplacian 0.005675, dIdt  
0.003616  
10it [00:28, 2.81s/it]  
Epoch 22, Epoch loss: total 12655.167383, pixel 420.124210, grad 19.696843, la  
placian 0.369305, dIdt 12214.977051  
Epoch 22, Epoch SSIM: pixel -0.081956, grad 0.010534, laplacian 0.005921, dIdt  
0.003618  
10it [00:28, 2.88s/it]  
Epoch 23, Epoch loss: total 12633.934082, pixel 418.201328, grad 20.109980, la  
placian 0.366989, dIdt 12195.255762  
Epoch 23, Epoch SSIM: pixel 0.001125, grad 0.010420, laplacian 0.005756, dIdt  
0.003650  
10it [00:28, 2.81s/it]  
Epoch 24, Epoch loss: total 12612.009766, pixel 419.845172, grad 20.504677, la  
placian 0.369182, dIdt 12171.290723  
Epoch 24, Epoch SSIM: pixel 0.000781, grad 0.010320, laplacian 0.005830, dIdt  
0.003692  
10it [00:28, 2.81s/it]  
Epoch 25, Epoch loss: total 12588.785059, pixel 419.740795, grad 21.047735, la  
placian 0.374154, dIdt 12147.622461  
Epoch 25, Epoch SSIM: pixel 0.000508, grad 0.010178, laplacian 0.006373, dIdt  
0.003730  
10it [00:28, 2.83s/it]  
Epoch 26, Epoch loss: total 12565.759277, pixel 417.120959, grad 21.792280, la  
placian 0.381995, dIdt 12126.464258  
Epoch 26, Epoch SSIM: pixel 0.000649, grad 0.009991, laplacian 0.006197, dIdt  
0.003761  
10it [00:28, 2.81s/it]  
Epoch 27, Epoch loss: total 12539.851855, pixel 410.355184, grad 22.692634, la  
placian 0.393508, dIdt 12106.410449  
Epoch 27, Epoch SSIM: pixel 0.000222, grad 0.009772, laplacian 0.005547, dIdt  
0.003791  
10it [00:28, 2.80s/it]
```

```
Epoch 28, Epoch loss: total 12521.152930, pixel 408.260908, grad 23.613711, la  
placian 0.411846, dIdt 12088.866406  
Epoch 28, Epoch SSIM: pixel 0.000109, grad 0.009586, laplacian 0.004276, dIdt  
0.003814  
10it [00:28, 2.83s/it]  
Epoch 29, Epoch loss: total 12499.939844, pixel 403.259054, grad 24.522131, la  
placian 0.433306, dIdt 12071.725293  
Epoch 29, Epoch SSIM: pixel 0.000214, grad 0.009415, laplacian 0.003612, dIdt  
0.003837  
10it [00:31, 3.13s/it]  
Epoch 30, Epoch loss: total 12482.674121, pixel 401.059956, grad 25.421131, la  
placian 0.460262, dIdt 12055.732813  
Epoch 30, Epoch SSIM: pixel 0.000387, grad 0.009270, laplacian 0.002873, dIdt  
0.003859  
10it [00:28, 2.80s/it]  
Epoch 31, Epoch loss: total 12464.720898, pixel 397.622983, grad 26.291479, la  
placian 0.491168, dIdt 12040.315234  
Epoch 31, Epoch SSIM: pixel 0.000492, grad 0.009144, laplacian 0.002578, dIdt  
0.003881  
10it [00:28, 2.86s/it]  
Epoch 32, Epoch loss: total 12448.340137, pixel 394.786431, grad 27.125442, la  
placian 0.526114, dIdt 12025.902148  
Epoch 32, Epoch SSIM: pixel 0.000594, grad 0.009040, laplacian 0.001571, dIdt  
0.003901  
10it [00:27, 2.80s/it]  
Epoch 33, Epoch loss: total 12432.443750, pixel 391.650157, grad 27.918999, la  
placian 0.565006, dIdt 12012.309570  
Epoch 33, Epoch SSIM: pixel 0.000646, grad 0.008954, laplacian 0.001769, dIdt  
0.003920  
10it [00:28, 2.82s/it]  
Epoch 34, Epoch loss: total 12417.611621, pixel 388.738422, grad 28.677526, la  
placian 0.607829, dIdt 11999.587891  
Epoch 34, Epoch SSIM: pixel 0.000663, grad 0.008883, laplacian 0.001019, dIdt  
0.003938  
10it [00:28, 2.81s/it]  
Epoch 35, Epoch loss: total 12403.606641, pixel 385.813402, grad 29.363192, la  
placian 0.653448, dIdt 11987.776562  
Epoch 35, Epoch SSIM: pixel 0.000661, grad 0.008834, laplacian 0.000783, dIdt  
0.003954  
10it [00:28, 2.87s/it]  
Epoch 36, Epoch loss: total 12390.659180, pixel 383.149712, grad 29.967081, la  
placian 0.701876, dIdt 11976.840430  
Epoch 36, Epoch SSIM: pixel 0.000660, grad 0.008805, laplacian 0.000789, dIdt  
0.003970  
10it [00:28, 2.80s/it]  
Epoch 37, Epoch loss: total 12378.226465, pixel 380.348129, grad 30.503609, la  
placian 0.752613, dIdt 11966.622168  
Epoch 37, Epoch SSIM: pixel 0.000688, grad 0.008792, laplacian 0.000757, dIdt  
0.003984  
10it [00:28, 2.81s/it]  
Epoch 38, Epoch loss: total 12366.483594, pixel 377.578956, grad 30.967283, la  
placian 0.804467, dIdt 11957.132812  
Epoch 38, Epoch SSIM: pixel 0.000693, grad 0.008795, laplacian 0.000629, dIdt  
0.003998  
10it [00:28, 2.81s/it]
```

```
Epoch 39, Epoch loss: total 12355.591406, pixel 374.961052, grad 31.345868, la  
placian 0.856357, dIdt 11948.428223  
Epoch 39, Epoch SSIM: pixel 0.000705, grad 0.008815, laplacian 0.000556, dIdt  
0.004011  
10it [00:31, 3.16s/it]  
Epoch 40, Epoch loss: total 12345.516309, pixel 372.486283, grad 31.653360, la  
placian 0.907977, dIdt 11940.468848  
Epoch 40, Epoch SSIM: pixel 0.000752, grad 0.008846, laplacian 0.000479, dIdt  
0.004023  
10it [00:28, 2.81s/it]  
Epoch 41, Epoch loss: total 12336.207910, pixel 370.145271, grad 31.911531, la  
placian 0.959242, dIdt 11933.191797  
Epoch 41, Epoch SSIM: pixel 0.000819, grad 0.008886, laplacian 0.000366, dIdt  
0.004034  
10it [00:28, 2.83s/it]  
Epoch 42, Epoch loss: total 12327.630762, pixel 367.931939, grad 32.136886, la  
placian 1.009715, dIdt 11926.552246  
Epoch 42, Epoch SSIM: pixel 0.000880, grad 0.008928, laplacian 0.000319, dIdt  
0.004044  
10it [00:28, 2.80s/it]  
Epoch 43, Epoch loss: total 12319.738184, pixel 365.797647, grad 32.336083, la  
placian 1.058524, dIdt 11920.545801  
Epoch 43, Epoch SSIM: pixel 0.000972, grad 0.008970, laplacian 0.000299, dIdt  
0.004054  
10it [00:28, 2.87s/it]  
Epoch 44, Epoch loss: total 12312.501660, pixel 363.702908, grad 32.512243, la  
placian 1.104581, dIdt 11915.181934  
Epoch 44, Epoch SSIM: pixel 0.001046, grad 0.009010, laplacian 0.000271, dIdt  
0.004063  
10it [00:28, 2.84s/it]  
Epoch 45, Epoch loss: total 12306.010254, pixel 361.703601, grad 32.662554, la  
placian 1.146672, dIdt 11910.497363  
Epoch 45, Epoch SSIM: pixel 0.001158, grad 0.009047, laplacian 0.000277, dIdt  
0.004070  
10it [00:28, 2.82s/it]  
Epoch 46, Epoch loss: total 12300.234375, pixel 359.762060, grad 32.786092, la  
placian 1.183928, dIdt 11906.502246  
Epoch 46, Epoch SSIM: pixel 0.001252, grad 0.009080, laplacian 0.000282, dIdt  
0.004077  
10it [00:28, 2.82s/it]  
Epoch 47, Epoch loss: total 12295.135449, pixel 357.849180, grad 32.886326, la  
placian 1.215677, dIdt 11903.184277  
Epoch 47, Epoch SSIM: pixel 0.001336, grad 0.009106, laplacian 0.000292, dIdt  
0.004083  
10it [00:28, 2.84s/it]  
Epoch 48, Epoch loss: total 12290.744043, pixel 355.994203, grad 32.965565, la  
placian 1.241184, dIdt 11900.543164  
Epoch 48, Epoch SSIM: pixel 0.001435, grad 0.009124, laplacian 0.000289, dIdt  
0.004088  
10it [00:28, 2.86s/it]  
Epoch 49, Epoch loss: total 12287.057617, pixel 354.185329, grad 33.023778, la  
placian 1.259830, dIdt 11898.588672  
Epoch 49, Epoch SSIM: pixel 0.001516, grad 0.009133, laplacian 0.000290, dIdt  
0.004091  
10it [00:31, 3.14s/it]
```

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Epoch 50, Epoch loss: total 12284.092480, pixel 352.416674, grad 33.058600, la  
placian 1.271078, dIdt 11897.346094  
Epoch 50, Epoch SSIM: pixel 0.001578, grad 0.009133, laplacian 0.000290, dIdt  
0.004094  
10it [00:28, 2.84s/it]  
Epoch 51, Epoch loss: total 12282.707227, pixel 351.424112, grad 33.036973, la  
placian 1.275074, dIdt 11896.971094  
Epoch 51, Epoch SSIM: pixel 0.001519, grad 0.009137, laplacian 0.000291, dIdt  
0.004094  
10it [00:28, 2.84s/it]  
Epoch 52, Epoch loss: total 12284.237305, pixel 353.264903, grad 33.068966, la  
placian 1.280269, dIdt 11896.623145  
Epoch 52, Epoch SSIM: pixel 0.001514, grad 0.009153, laplacian 0.000281, dIdt  
0.004095  
10it [00:28, 2.85s/it]  
Epoch 53, Epoch loss: total 12285.435156, pixel 355.390520, grad 33.125443, la  
placian 1.293321, dIdt 11895.625977  
Epoch 53, Epoch SSIM: pixel 0.001512, grad 0.009181, laplacian 0.000287, dIdt  
0.004096  
10it [00:28, 2.86s/it]  
Epoch 54, Epoch loss: total 12286.271289, pixel 357.609190, grad 33.180057, la  
placian 1.314092, dIdt 11894.167871  
Epoch 54, Epoch SSIM: pixel 0.001469, grad 0.009228, laplacian 0.000285, dIdt  
0.004098  
10it [00:28, 2.85s/it]  
Epoch 55, Epoch loss: total 12286.404785, pixel 359.525340, grad 33.215736, la  
placian 1.342579, dIdt 11892.320996  
Epoch 55, Epoch SSIM: pixel 0.001360, grad 0.009297, laplacian 0.000294, dIdt  
0.004099  
10it [00:28, 2.84s/it]  
Epoch 56, Epoch loss: total 12285.569922, pixel 360.947739, grad 33.239392, la  
placian 1.379072, dIdt 11890.003809  
Epoch 56, Epoch SSIM: pixel 0.001294, grad 0.009385, laplacian 0.000292, dIdt  
0.004101  
10it [00:28, 2.84s/it]  
Epoch 57, Epoch loss: total 12283.918359, pixel 362.112870, grad 33.269036, la  
placian 1.424092, dIdt 11887.112402  
Epoch 57, Epoch SSIM: pixel 0.001194, grad 0.009494, laplacian 0.000277, dIdt  
0.004103  
10it [00:28, 2.84s/it]  
Epoch 58, Epoch loss: total 12281.816406, pixel 363.377700, grad 33.310750, la  
placian 1.478502, dIdt 11883.649414  
Epoch 58, Epoch SSIM: pixel 0.001193, grad 0.009629, laplacian 0.000272, dIdt  
0.004107  
10it [00:28, 2.85s/it]  
Epoch 59, Epoch loss: total 12279.305664, pixel 364.738975, grad 33.353417, la  
placian 1.543541, dIdt 11879.669824  
Epoch 59, Epoch SSIM: pixel 0.001164, grad 0.009798, laplacian 0.000270, dIdt  
0.004111  
10it [00:31, 3.15s/it]  
Epoch 60, Epoch loss: total 12276.198242, pixel 366.033961, grad 33.389563, la  
placian 1.620604, dIdt 11875.154199  
Epoch 60, Epoch SSIM: pixel 0.001212, grad 0.010012, laplacian 0.000270, dIdt  
0.004116  
10it [00:29, 2.93s/it]
```

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Epoch 61, Epoch loss: total 12272.504980, pixel 367.313097, grad 33.418881, la  
placian 1.711236, dIdt 11870.061816  
Epoch 61, Epoch SSIM: pixel 0.001341, grad 0.010287, laplacian 0.000248, dIdt  
0.004121  
10it [00:28, 2.84s/it]  
Epoch 62, Epoch loss: total 12268.252344, pixel 368.614221, grad 33.438708, la  
placian 1.817299, dIdt 11864.382227  
Epoch 62, Epoch SSIM: pixel 0.001373, grad 0.010647, laplacian 0.000220, dIdt  
0.004129  
10it [00:28, 2.85s/it]  
Epoch 63, Epoch loss: total 12263.585352, pixel 370.044846, grad 33.447386, la  
placian 1.941218, dIdt 11858.151758  
Epoch 63, Epoch SSIM: pixel 0.002515, grad 0.011130, laplacian 0.000221, dIdt  
0.004137  
10it [00:28, 2.84s/it]  
Epoch 64, Epoch loss: total 12258.423437, pixel 371.487832, grad 33.445479, la  
placian 2.086235, dIdt 11851.403906  
Epoch 64, Epoch SSIM: pixel 0.001493, grad 0.011792, laplacian 0.000228, dIdt  
0.004146  
10it [00:28, 2.83s/it]  
Epoch 65, Epoch loss: total 12252.658008, pixel 372.841514, grad 33.434220, la  
placian 2.255866, dIdt 11844.126367  
Epoch 65, Epoch SSIM: pixel 0.001885, grad 0.012708, laplacian 0.000205, dIdt  
0.004156  
10it [00:28, 2.81s/it]  
Epoch 66, Epoch loss: total 12246.403418, pixel 374.226322, grad 33.414527, la  
placian 2.453774, dIdt 11836.308691  
Epoch 66, Epoch SSIM: pixel 0.001811, grad 0.013898, laplacian 0.000205, dIdt  
0.004167  
10it [00:28, 2.83s/it]  
Epoch 67, Epoch loss: total 12239.613867, pixel 375.602215, grad 33.388164, la  
placian 2.684407, dIdt 11827.939160  
Epoch 67, Epoch SSIM: pixel 0.001880, grad 0.015191, laplacian 0.000177, dIdt  
0.004179  
10it [00:28, 2.81s/it]  
Epoch 68, Epoch loss: total 12232.559961, pixel 377.110784, grad 33.353294, la  
placian 2.951977, dIdt 11819.143945  
Epoch 68, Epoch SSIM: pixel 0.002448, grad 0.016247, laplacian 0.000154, dIdt  
0.004191  
10it [00:28, 2.81s/it]  
Epoch 69, Epoch loss: total 12225.041992, pixel 378.576893, grad 33.291768, la  
placian 3.261708, dIdt 11809.911719  
Epoch 69, Epoch SSIM: pixel 0.002943, grad 0.016867, laplacian 0.000140, dIdt  
0.004205  
10it [00:31, 3.17s/it]  
Epoch 70, Epoch loss: total 12217.318848, pixel 380.277296, grad 33.228276, la  
placian 3.621604, dIdt 11800.191602  
Epoch 70, Epoch SSIM: pixel 0.003578, grad 0.017246, laplacian 0.000128, dIdt  
0.004219  
10it [00:28, 2.84s/it]  
Epoch 71, Epoch loss: total 12208.905176, pixel 381.713451, grad 33.203907, la  
placian 4.042925, dIdt 11789.944922  
Epoch 71, Epoch SSIM: pixel 0.004383, grad 0.017292, laplacian 0.000144, dIdt  
0.004235  
10it [00:28, 2.82s/it]
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Epoch 72, Epoch loss: total 12200.664844, pixel 383.526695, grad 33.243971, la  
placian 4.532890, dIdt 11779.361328  
Epoch 72, Epoch SSIM: pixel 0.005762, grad 0.017080, laplacian 0.000188, dIdt  
0.004251  
10it [00:28, 2.84s/it]  
Epoch 73, Epoch loss: total 12192.254590, pixel 385.342935, grad 33.353993, la  
placian 5.104275, dIdt 11768.453516  
Epoch 73, Epoch SSIM: pixel 0.007571, grad 0.016712, laplacian 0.000837, dIdt  
0.004267  
10it [00:28, 2.88s/it]  
Epoch 74, Epoch loss: total 12183.871094, pixel 387.482181, grad 33.611784, la  
placian 5.770478, dIdt 11757.006641  
Epoch 74, Epoch SSIM: pixel 0.009996, grad 0.016150, laplacian 0.004251, dIdt  
0.004284  
10it [00:28, 2.83s/it]  
Epoch 75, Epoch loss: total 12175.523340, pixel 389.803506, grad 34.043209, la  
placian 6.538418, dIdt 11745.138184  
Epoch 75, Epoch SSIM: pixel 0.013142, grad 0.015682, laplacian 0.003646, dIdt  
0.004302  
10it [00:28, 2.83s/it]  
Epoch 76, Epoch loss: total 12166.581836, pixel 391.610730, grad 34.696620, la  
placian 7.423476, dIdt 11732.851074  
Epoch 76, Epoch SSIM: pixel 0.017885, grad 0.015215, laplacian 0.002339, dIdt  
0.004321  
10it [00:28, 2.82s/it]  
Epoch 77, Epoch loss: total 12150.144238, pixel 387.290458, grad 35.353011, la  
placian 8.412083, dIdt 11719.088672  
Epoch 77, Epoch SSIM: pixel 0.022561, grad 0.014613, laplacian 0.003434, dIdt  
0.004345  
10it [00:28, 2.84s/it]  
Epoch 78, Epoch loss: total 12142.907227, pixel 390.324872, grad 36.485733, la  
placian 9.430971, dIdt 11706.665723  
Epoch 78, Epoch SSIM: pixel 0.021038, grad 0.014127, laplacian 0.002755, dIdt  
0.004367  
10it [00:28, 2.85s/it]  
Epoch 79, Epoch loss: total 12126.850195, pixel 384.341989, grad 37.338557, la  
placian 10.462483, dIdt 11694.707031  
Epoch 79, Epoch SSIM: pixel 0.011910, grad 0.013842, laplacian 0.001568, dIdt  
0.004387  
10it [00:31, 3.15s/it]  
Epoch 80, Epoch loss: total 12121.409668, pixel 387.414684, grad 38.678807, la  
placian 11.481651, dIdt 11683.834473  
Epoch 80, Epoch SSIM: pixel 0.002598, grad 0.013426, laplacian 0.001991, dIdt  
0.004406  
-----Finished-----  
-----Generating Data-----  
100%|██████████| 10/10 [00:00<00:00, 1265.33it/s]  
-----Finished-----
```

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10it [00:19,  1.95s/it]
ffmpeg version 4.1.9-0+deb10u1 Copyright (c) 2000-2022 the FFmpeg developers
  built with gcc 8 (Debian 8.3.0-6)
  configuration: --prefix=/usr --extra-version=0+deb10u1 --toolchain=hardened
  --libdir=/usr/lib/x86_64-linux-gnu --incdir=/usr/include/x86_64-linux-gnu --arch=amd64 --enable-gpl --disable-stripping --enable-avresample --disable-filter=resample --enable-avisynth --enable-gnutls --enable-ladspa --enable-libaom --enable-libass --enable-libbluray --enable-libbs2b --enable-libcaca --enable-libcdio --enable-libcodec2 --enable-libflite --enable-libfontconfig --enable-libfreetype --enable-libfribidi --enable-libgme --enable-libgsm --enable-libjack --enable-libmp3lame --enable-libmysofa --enable-libopenjpeg --enable-libopenmp3 --enable-libopus --enable-libpulse --enable-librsvg --enable-librubberband --enable-libshine --enable-libsnappy --enable-libsoxr --enable-libspeex --enable-libssh --enable-libtheora --enable-libtwolame --enable-libvidstab --enable-libvorbis --enable-libvpx --enable-libwavpack --enable-libwebp --enable-libx265 --enable-libxml2 --enable-libxvid --enable-libzmq --enable-libzvbi --enable-lv2 --enable-omx --enable-openal --enable-opengl --enable-sdl2 --enable-libdc1394 --enable-libdrm --enable-libiec61883 --enable-chromaprint --enable-frei0r --enable-libx264 --enable-shared
  libavutil      56. 22.100 / 56. 22.100
  libavcodec     58. 35.100 / 58. 35.100
  libavformat    58. 20.100 / 58. 20.100
  libavdevice     58.  5.100 / 58.  5.100
  libavfilter     7. 40.101 /  7. 40.101
  libavresample   4.  0.  0 /  4.  0.  0
  libswscale      5.  3.100 /  5.  3.100
  libswresample   3.  3.100 /  3.  3.100
  libpostproc    55.  3.100 / 55.  3.100
Input #0, image2, from 'tmp/file%02d.png':
  Duration: 00:00:05.00, start: 0.000000, bitrate: N/A
    Stream #0:0: Video: png, rgba(pc), 1296x432 [SAR 2835:2835 DAR 3:1], 2 fps, 2 tbr, 2 tbn, 2 tbc
    Stream mapping:
      Stream #0:0 -> #0:0 (png (native) -> h264 (libx264))
Press [q] to stop, [?] for help
[libx264 @ 0x5594adbeff00] using SAR=1/1
[libx264 @ 0x5594adbeff00] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2 AVX FMA3 BMI2 AVX2
[libx264 @ 0x5594adbeff00] profile High, level 3.1
[libx264 @ 0x5594adbeff00] 264 - core 155 r2917 0a84d98 - H.264/MPEG-4 AVC codec - Copyleft 2003-2018 - http://www.videolan.org/x264.html - options: cabac=1 ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00:0.00 mixed_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast_pskip=1 chroma_qp_offset=-2 threads=3 lookahead_threads=1 sliced_threads=0 nr=0 decimate=1 interlaced=0 bluray_compat=0 constrained_intra=0 bframes=3 b_pyramid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 keyint_min=25 scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=2.3.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ratio=1.40 aq=1:1.00
Output #0, mp4, to '/home/jupyter/videos/runs/cameraman/experiments/elu_cyclic_le-04_le-07_video.mp4':
  Metadata:
    encoder : Lavf58.20.100
  Stream #0:0: Video: h264 (libx264) (avc1 / 0x31637661), yuv420p, 1296x432 [SAR 1:1 DAR 3:1], q=-1--1, 30 fps, 15360 tbn, 30 tbc
  Metadata:
    encoder : Lavc58.35.100 libx264
  Side data:
    cpb: bitrate max/min/avg: 0/0/0 buffer size: 0 vbv_delay: -1
    frame= 150 fps=108 q=-1.0 Lsize= 158kB time=00:00:04.90 bitrate= 263.7kbit/s dup=140 drop=0 speed=3.54x

```

```
video:155kB audio:0kB subtitle:0kB other streams:0kB global headers:0kB muxing overhead: 1.669216%
[libx264 @ 0x5594adbeff00] frame I:1      Avg QP:18.70  size: 40273
[libx264 @ 0x5594adbeff00] frame P:38     Avg QP:18.85  size: 2861
[libx264 @ 0x5594adbeff00] frame B:111    Avg QP:15.02  size:     83
[libx264 @ 0x5594adbeff00] consecutive B-frames: 1.3% 0.0% 0.0% 98.7%
[libx264 @ 0x5594adbeff00] mb I  I16..4: 43.9% 32.4% 23.7%
[libx264 @ 0x5594adbeff00] mb P  I16..4:  1.4%  0.4%  0.2%  P16..4:  4.9%  1.5% 1.1% 0.0% 0.0%  skip:90.4%
[libx264 @ 0x5594adbeff00] mb B  I16..4:  0.1%  0.0%  0.0%  B16..8:  2.8%  0.0% 0.0% direct: 0.0% skip:97.0% L0:45.3% L1:54.6% BI: 0.1%
[libx264 @ 0x5594adbeff00] 8x8 transform intra:27.1% inter:62.9%
[libx264 @ 0x5594adbeff00] coded y,uvDC,uvAC intra: 23.3% 49.3% 29.7% inter: 0.7% 1.2% 0.5%
[libx264 @ 0x5594adbeff00] i16 v,h,dc,p: 36% 20% 6% 39%
[libx264 @ 0x5594adbeff00] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 34% 14% 34% 2% 1% 1% 1% 12%
[libx264 @ 0x5594adbeff00] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 30% 30% 19% 4% 3% 3% 4% 3% 4%
[libx264 @ 0x5594adbeff00] i8c dc,h,v,p: 44% 18% 11% 26%
[libx264 @ 0x5594adbeff00] Weighted P-Frames: Y:0.0% UV:0.0%
[libx264 @ 0x5594adbeff00] ref P L0: 79.7% 12.2% 7.4% 0.8%
[libx264 @ 0x5594adbeff00] ref B L0: 71.4% 28.1% 0.4%
[libx264 @ 0x5594adbeff00] ref B L1: 97.8% 2.2%
[libx264 @ 0x5594adbeff00] kb/s:253.10
```

-----Generating Data-----

100%|██████████| 10/10 [00:00<00:00, 1154.47it/s]

-----Finished-----

-----Begin Training-----

10it [00:27, 2.78s/it]

Epoch 1, Epoch loss: total 17851.751758, pixel 0.383899, grad 7.885157, laplacian 0.015413, dIdt 17843.467285

Epoch 1, Epoch SSIM: pixel -0.053289, grad 0.061035, laplacian 0.284677, dIdt 0.000086

10it [00:28, 2.89s/it]

Epoch 2, Epoch loss: total 17567.005469, pixel 0.897919, grad 7.992495, laplacian 0.015643, dIdt 17558.099512

Epoch 2, Epoch SSIM: pixel 0.004017, grad 0.043389, laplacian 0.203557, dIdt 0.000032

10it [00:28, 2.82s/it]

Epoch 3, Epoch loss: total 17282.300293, pixel 2.037898, grad 8.148038, laplacian 0.016767, dIdt 17272.097559

Epoch 3, Epoch SSIM: pixel 0.015087, grad 0.034020, laplacian 0.111532, dIdt 0.000058

10it [00:28, 2.83s/it]

Epoch 4, Epoch loss: total 17220.407031, pixel 2.330406, grad 8.195093, laplacian 0.017134, dIdt 17209.864258

Epoch 4, Epoch SSIM: pixel 0.016768, grad 0.032608, laplacian 0.101882, dIdt 0.000066

10it [00:28, 2.87s/it]

Epoch 5, Epoch loss: total 17178.021973, pixel 2.515876, grad 8.225103, laplacian 0.017431, dIdt 17167.263477

Epoch 5, Epoch SSIM: pixel 0.017733, grad 0.031832, laplacian 0.098739, dIdt 0.000072

10it [00:29, 2.90s/it]

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Epoch 6, Epoch loss: total 17171.285742, pixel 2.549589, grad 8.230363, laplacian 0.017476, dIdt 17160.488379
Epoch 6, Epoch SSIM: pixel 0.017838, grad 0.031705, laplacian 0.097925, dIdt 0.000073
10it [00:28, 2.84s/it]
Epoch 7, Epoch loss: total 17166.995898, pixel 2.569546, grad 8.233407, laplacian 0.017508, dIdt 17156.175293
Epoch 7, Epoch SSIM: pixel 0.017916, grad 0.031634, laplacian 0.097642, dIdt 0.000074
10it [00:28, 2.85s/it]
Epoch 8, Epoch loss: total 17166.340723, pixel 2.572915, grad 8.233918, laplacian 0.017512, dIdt 17155.516504
Epoch 8, Epoch SSIM: pixel 0.017927, grad 0.031622, laplacian 0.097556, dIdt 0.000074
10it [00:28, 2.84s/it]
Epoch 9, Epoch loss: total 17165.696094, pixel 2.576251, grad 8.234422, laplacian 0.017517, dIdt 17154.867871
Epoch 9, Epoch SSIM: pixel 0.017933, grad 0.031610, laplacian 0.097479, dIdt 0.000074
10it [00:31, 3.15s/it]
Epoch 10, Epoch loss: total 17165.059570, pixel 2.579561, grad 8.234920, laplacian 0.017521, dIdt 17154.227734
Epoch 10, Epoch SSIM: pixel 0.017940, grad 0.031598, laplacian 0.097412, dIdt 0.000074
10it [00:28, 2.89s/it]
Epoch 11, Epoch loss: total 17164.429980, pixel 2.582850, grad 8.235414, laplacian 0.017525, dIdt 17153.594238
Epoch 11, Epoch SSIM: pixel 0.017946, grad 0.031587, laplacian 0.097340, dIdt 0.000074
10it [00:28, 2.84s/it]
Epoch 12, Epoch loss: total 17163.805273, pixel 2.586121, grad 8.235904, laplacian 0.017530, dIdt 17152.966016
Epoch 12, Epoch SSIM: pixel 0.017953, grad 0.031575, laplacian 0.097270, dIdt 0.000074
10it [00:28, 2.84s/it]
Epoch 13, Epoch loss: total 17163.185937, pixel 2.589378, grad 8.236392, laplacian 0.017534, dIdt 17152.342480
Epoch 13, Epoch SSIM: pixel 0.017959, grad 0.031564, laplacian 0.097209, dIdt 0.000074
10it [00:28, 2.84s/it]
Epoch 14, Epoch loss: total 17162.569238, pixel 2.592623, grad 8.236877, laplacian 0.017538, dIdt 17151.722070
Epoch 14, Epoch SSIM: pixel 0.017966, grad 0.031553, laplacian 0.097148, dIdt 0.000075
10it [00:28, 2.84s/it]
Epoch 15, Epoch loss: total 17161.955469, pixel 2.595859, grad 8.237360, laplacian 0.017542, dIdt 17151.104785
Epoch 15, Epoch SSIM: pixel 0.017970, grad 0.031541, laplacian 0.097077, dIdt 0.000075
10it [00:28, 2.83s/it]
Epoch 16, Epoch loss: total 17161.344336, pixel 2.599089, grad 8.237842, laplacian 0.017546, dIdt 17150.490039
Epoch 16, Epoch SSIM: pixel 0.017977, grad 0.031530, laplacian 0.097007, dIdt 0.000075
10it [00:28, 2.86s/it]
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Epoch 17, Epoch loss: total 17160.735059, pixel 2.602315, grad 8.238322, lapla
cian 0.017550, dIdt 17149.876855
Epoch 17, Epoch SSIM: pixel 0.017984, grad 0.031519, laplacian 0.096944, dIdt
0.000075
10it [00:28, 2.84s/it]
Epoch 18, Epoch loss: total 17160.126953, pixel 2.605538, grad 8.238802, lapla
cian 0.017554, dIdt 17149.265234
Epoch 18, Epoch SSIM: pixel 0.017986, grad 0.031508, laplacian 0.096877, dIdt
0.000075
10it [00:28, 2.84s/it]
Epoch 19, Epoch loss: total 17159.520898, pixel 2.608760, grad 8.239280, lapla
cian 0.017559, dIdt 17148.655273
Epoch 19, Epoch SSIM: pixel 0.017994, grad 0.031497, laplacian 0.096807, dIdt
0.000075
10it [00:31, 3.13s/it]
Epoch 20, Epoch loss: total 17158.915527, pixel 2.611982, grad 8.239758, lapla
cian 0.017563, dIdt 17148.046289
Epoch 20, Epoch SSIM: pixel 0.017998, grad 0.031486, laplacian 0.096736, dIdt
0.000075
10it [00:28, 2.81s/it]
Epoch 21, Epoch loss: total 17158.311133, pixel 2.615204, grad 8.240236, lapla
cian 0.017567, dIdt 17147.437988
Epoch 21, Epoch SSIM: pixel 0.018004, grad 0.031475, laplacian 0.096664, dIdt
0.000075
10it [00:28, 2.82s/it]
Epoch 22, Epoch loss: total 17157.706934, pixel 2.618427, grad 8.240713, lapla
cian 0.017571, dIdt 17146.830371
Epoch 22, Epoch SSIM: pixel 0.018009, grad 0.031464, laplacian 0.096592, dIdt
0.000075
10it [00:28, 2.81s/it]
Epoch 23, Epoch loss: total 17157.104492, pixel 2.621652, grad 8.241190, lapla
cian 0.017575, dIdt 17146.224023
Epoch 23, Epoch SSIM: pixel 0.018013, grad 0.031453, laplacian 0.096519, dIdt
0.000075
10it [00:28, 2.88s/it]
Epoch 24, Epoch loss: total 17156.501855, pixel 2.624880, grad 8.241666, lapla
cian 0.017580, dIdt 17145.617676
Epoch 24, Epoch SSIM: pixel 0.018017, grad 0.031442, laplacian 0.096456, dIdt
0.000075
10it [00:28, 2.82s/it]
Epoch 25, Epoch loss: total 17155.899902, pixel 2.628109, grad 8.242142, lapla
cian 0.017584, dIdt 17145.011914
Epoch 25, Epoch SSIM: pixel 0.018021, grad 0.031431, laplacian 0.096388, dIdt
0.000076
10it [00:28, 2.82s/it]
Epoch 26, Epoch loss: total 17155.297949, pixel 2.631340, grad 8.242618, lapla
cian 0.017588, dIdt 17144.406445
Epoch 26, Epoch SSIM: pixel 0.018028, grad 0.031420, laplacian 0.096319, dIdt
0.000076
10it [00:28, 2.85s/it]
Epoch 27, Epoch loss: total 17154.696875, pixel 2.634575, grad 8.243094, lapla
cian 0.017592, dIdt 17143.801465
Epoch 27, Epoch SSIM: pixel 0.018031, grad 0.031409, laplacian 0.096248, dIdt
0.000076
10it [00:28, 2.85s/it]
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Epoch 28, Epoch loss: total 17154.095898, pixel 2.637812, grad 8.243570, lapla
cian 0.017596, dIdt 17143.196875
Epoch 28, Epoch SSIM: pixel 0.018036, grad 0.031398, laplacian 0.096186, dIdt
0.000076
10it [00:28, 2.82s/it]
Epoch 29, Epoch loss: total 17153.494824, pixel 2.641052, grad 8.244045, lapla
cian 0.017600, dIdt 17142.592187
Epoch 29, Epoch SSIM: pixel 0.018038, grad 0.031387, laplacian 0.096127, dIdt
0.000076
10it [00:31, 3.13s/it]
Epoch 30, Epoch loss: total 17152.894727, pixel 2.644295, grad 8.244521, lapla
cian 0.017605, dIdt 17141.988379
Epoch 30, Epoch SSIM: pixel 0.018044, grad 0.031377, laplacian 0.096060, dIdt
0.000076
10it [00:28, 2.82s/it]
Epoch 31, Epoch loss: total 17152.294434, pixel 2.647541, grad 8.244996, lapla
cian 0.017609, dIdt 17141.384180
Epoch 31, Epoch SSIM: pixel 0.018047, grad 0.031366, laplacian 0.095989, dIdt
0.000076
10it [00:28, 2.89s/it]
Epoch 32, Epoch loss: total 17151.693848, pixel 2.650791, grad 8.245471, lapla
cian 0.017613, dIdt 17140.780078
Epoch 32, Epoch SSIM: pixel 0.018054, grad 0.031355, laplacian 0.095927, dIdt
0.000076
10it [00:28, 2.81s/it]
Epoch 33, Epoch loss: total 17151.093945, pixel 2.654044, grad 8.245947, lapla
cian 0.017617, dIdt 17140.176465
Epoch 33, Epoch SSIM: pixel 0.018055, grad 0.031344, laplacian 0.095865, dIdt
0.000076
10it [00:28, 2.80s/it]
Epoch 34, Epoch loss: total 17150.493750, pixel 2.657300, grad 8.246422, lapla
cian 0.017622, dIdt 17139.572559
Epoch 34, Epoch SSIM: pixel 0.018059, grad 0.031333, laplacian 0.095800, dIdt
0.000076
10it [00:28, 2.81s/it]
Epoch 35, Epoch loss: total 17149.894238, pixel 2.660561, grad 8.246898, lapla
cian 0.017626, dIdt 17138.969141
Epoch 35, Epoch SSIM: pixel 0.018064, grad 0.031323, laplacian 0.095738, dIdt
0.000076
10it [00:28, 2.87s/it]
Epoch 36, Epoch loss: total 17149.294238, pixel 2.663824, grad 8.247373, lapla
cian 0.017630, dIdt 17138.365430
Epoch 36, Epoch SSIM: pixel 0.018068, grad 0.031312, laplacian 0.095666, dIdt
0.000077
10it [00:28, 2.85s/it]
Epoch 37, Epoch loss: total 17148.694336, pixel 2.667092, grad 8.247849, lapla
cian 0.017634, dIdt 17137.761621
Epoch 37, Epoch SSIM: pixel 0.018072, grad 0.031301, laplacian 0.095605, dIdt
0.000077
10it [00:28, 2.84s/it]
Epoch 38, Epoch loss: total 17148.094531, pixel 2.670363, grad 8.248325, lapla
cian 0.017638, dIdt 17137.158301
Epoch 38, Epoch SSIM: pixel 0.018074, grad 0.031291, laplacian 0.095540, dIdt
0.000077
10it [00:28, 2.87s/it]
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Epoch 39, Epoch loss: total 17147.494629, pixel 2.673639, grad 8.248801, lapla  
cian 0.017643, dIdt 17136.554297  
Epoch 39, Epoch SSIM: pixel 0.018078, grad 0.031280, laplacian 0.095483, dIdt  
0.000077  
10it [00:31, 3.15s/it]  
Epoch 40, Epoch loss: total 17146.894629, pixel 2.676918, grad 8.249276, lapla  
cian 0.017647, dIdt 17135.950781  
Epoch 40, Epoch SSIM: pixel 0.018082, grad 0.031269, laplacian 0.095420, dIdt  
0.000077  
10it [00:29, 2.91s/it]  
Epoch 41, Epoch loss: total 17146.294336, pixel 2.680201, grad 8.249752, lapla  
cian 0.017651, dIdt 17135.346582  
Epoch 41, Epoch SSIM: pixel 0.018086, grad 0.031259, laplacian 0.095360, dIdt  
0.000077  
10it [00:28, 2.88s/it]  
Epoch 42, Epoch loss: total 17145.693555, pixel 2.683489, grad 8.250229, lapla  
cian 0.017655, dIdt 17134.742285  
Epoch 42, Epoch SSIM: pixel 0.018088, grad 0.031248, laplacian 0.095300, dIdt  
0.000077  
10it [00:28, 2.86s/it]  
Epoch 43, Epoch loss: total 17145.093359, pixel 2.686781, grad 8.250705, lapla  
cian 0.017659, dIdt 17134.138574  
Epoch 43, Epoch SSIM: pixel 0.018092, grad 0.031237, laplacian 0.095246, dIdt  
0.000077  
10it [00:28, 2.85s/it]  
Epoch 44, Epoch loss: total 17144.492969, pixel 2.690076, grad 8.251181, lapla  
cian 0.017664, dIdt 17133.534180  
Epoch 44, Epoch SSIM: pixel 0.018094, grad 0.031227, laplacian 0.095185, dIdt  
0.000077  
10it [00:29, 2.93s/it]  
Epoch 45, Epoch loss: total 17143.892578, pixel 2.693376, grad 8.251658, lapla  
cian 0.017668, dIdt 17132.929980  
Epoch 45, Epoch SSIM: pixel 0.018098, grad 0.031216, laplacian 0.095108, dIdt  
0.000077  
10it [00:28, 2.85s/it]  
Epoch 46, Epoch loss: total 17143.291895, pixel 2.696681, grad 8.252135, lapla  
cian 0.017672, dIdt 17132.325391  
Epoch 46, Epoch SSIM: pixel 0.018102, grad 0.031206, laplacian 0.095039, dIdt  
0.000077  
10it [00:28, 2.86s/it]  
Epoch 47, Epoch loss: total 17142.690820, pixel 2.699990, grad 8.252612, lapla  
cian 0.017676, dIdt 17131.720508  
Epoch 47, Epoch SSIM: pixel 0.018106, grad 0.031195, laplacian 0.094967, dIdt  
0.000078  
10it [00:28, 2.84s/it]  
Epoch 48, Epoch loss: total 17142.090332, pixel 2.703303, grad 8.253089, lapla  
cian 0.017681, dIdt 17131.116113  
Epoch 48, Epoch SSIM: pixel 0.018108, grad 0.031185, laplacian 0.094907, dIdt  
0.000078  
10it [00:28, 2.89s/it]  
Epoch 49, Epoch loss: total 17141.489063, pixel 2.706621, grad 8.253566, lapla  
cian 0.017685, dIdt 17130.511035  
Epoch 49, Epoch SSIM: pixel 0.018113, grad 0.031174, laplacian 0.094835, dIdt  
0.000078  
10it [00:31, 3.15s/it]
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Epoch 50, Epoch loss: total 17140.887109, pixel 2.709943, grad 8.254044, lapla
cian 0.017689, dIdt 17129.905273
Epoch 50, Epoch SSIM: pixel 0.018116, grad 0.031164, laplacian 0.094765, dIdt
0.000078
10it [00:28, 2.83s/it]
Epoch 51, Epoch loss: total 17140.285449, pixel 2.713270, grad 8.254521, lapla
cian 0.017694, dIdt 17129.300000
Epoch 51, Epoch SSIM: pixel 0.018117, grad 0.031153, laplacian 0.094697, dIdt
0.000078
10it [00:28, 2.83s/it]
Epoch 52, Epoch loss: total 17139.684082, pixel 2.716602, grad 8.255000, lapla
cian 0.017698, dIdt 17128.694629
Epoch 52, Epoch SSIM: pixel 0.018123, grad 0.031143, laplacian 0.094636, dIdt
0.000078
10it [00:28, 2.89s/it]
Epoch 53, Epoch loss: total 17139.081836, pixel 2.719938, grad 8.255478, lapla
cian 0.017703, dIdt 17128.088770
Epoch 53, Epoch SSIM: pixel 0.018124, grad 0.031132, laplacian 0.094565, dIdt
0.000078
10it [00:28, 2.82s/it]
Epoch 54, Epoch loss: total 17138.479785, pixel 2.723278, grad 8.255956, lapla
cian 0.017707, dIdt 17127.482812
Epoch 54, Epoch SSIM: pixel 0.018125, grad 0.031122, laplacian 0.094501, dIdt
0.000078
10it [00:28, 2.85s/it]
Epoch 55, Epoch loss: total 17137.877344, pixel 2.726624, grad 8.256435, lapla
cian 0.017711, dIdt 17126.876563
Epoch 55, Epoch SSIM: pixel 0.018131, grad 0.031111, laplacian 0.094429, dIdt
0.000078
10it [00:28, 2.81s/it]
Epoch 56, Epoch loss: total 17137.274219, pixel 2.729975, grad 8.256915, lapla
cian 0.017716, dIdt 17126.269434
Epoch 56, Epoch SSIM: pixel 0.018133, grad 0.031101, laplacian 0.094364, dIdt
0.000078
10it [00:28, 2.80s/it]
Epoch 57, Epoch loss: total 17136.671973, pixel 2.733329, grad 8.257394, lapla
cian 0.017720, dIdt 17125.663379
Epoch 57, Epoch SSIM: pixel 0.018136, grad 0.031090, laplacian 0.094301, dIdt
0.000079
10it [00:28, 2.85s/it]
Epoch 58, Epoch loss: total 17136.068457, pixel 2.736690, grad 8.257873, lapla
cian 0.017724, dIdt 17125.056152
Epoch 58, Epoch SSIM: pixel 0.018138, grad 0.031080, laplacian 0.094229, dIdt
0.000079
10it [00:28, 2.80s/it]
Epoch 59, Epoch loss: total 17135.464746, pixel 2.740055, grad 8.258353, lapla
cian 0.017728, dIdt 17124.448633
Epoch 59, Epoch SSIM: pixel 0.018143, grad 0.031069, laplacian 0.094167, dIdt
0.000079
10it [00:31, 3.12s/it]
Epoch 60, Epoch loss: total 17134.861328, pixel 2.743424, grad 8.258833, lapla
cian 0.017733, dIdt 17123.841113
Epoch 60, Epoch SSIM: pixel 0.018145, grad 0.031059, laplacian 0.094106, dIdt
0.000079
10it [00:28, 2.81s/it]
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Epoch 61, Epoch loss: total 17134.257227, pixel 2.746799, grad 8.259313, lapla
cian 0.017737, dIdt 17123.233301
Epoch 61, Epoch SSIM: pixel 0.018149, grad 0.031049, laplacian 0.094038, dIdt
0.000079
10it [00:28, 2.85s/it]
Epoch 62, Epoch loss: total 17133.652832, pixel 2.750178, grad 8.259794, lapla
cian 0.017742, dIdt 17122.624902
Epoch 62, Epoch SSIM: pixel 0.018151, grad 0.031038, laplacian 0.093969, dIdt
0.000079
10it [00:28, 2.81s/it]
Epoch 63, Epoch loss: total 17133.048535, pixel 2.753563, grad 8.260275, lapla
cian 0.017746, dIdt 17122.016797
Epoch 63, Epoch SSIM: pixel 0.018154, grad 0.031028, laplacian 0.093909, dIdt
0.000079
10it [00:28, 2.81s/it]
Epoch 64, Epoch loss: total 17132.443848, pixel 2.756952, grad 8.260756, lapla
cian 0.017750, dIdt 17121.408203
Epoch 64, Epoch SSIM: pixel 0.018155, grad 0.031017, laplacian 0.093845, dIdt
0.000079
10it [00:28, 2.82s/it]
Epoch 65, Epoch loss: total 17131.838672, pixel 2.760347, grad 8.261238, lapla
cian 0.017755, dIdt 17120.799219
Epoch 65, Epoch SSIM: pixel 0.018159, grad 0.031007, laplacian 0.093780, dIdt
0.000079
10it [00:28, 2.84s/it]
Epoch 66, Epoch loss: total 17131.233398, pixel 2.763746, grad 8.261720, lapla
cian 0.017759, dIdt 17120.190137
Epoch 66, Epoch SSIM: pixel 0.018162, grad 0.030997, laplacian 0.093704, dIdt
0.000079
10it [00:28, 2.82s/it]
Epoch 67, Epoch loss: total 17130.627734, pixel 2.767151, grad 8.262202, lapla
cian 0.017764, dIdt 17119.580664
Epoch 67, Epoch SSIM: pixel 0.018164, grad 0.030986, laplacian 0.093632, dIdt
0.000079
10it [00:28, 2.82s/it]
Epoch 68, Epoch loss: total 17130.021289, pixel 2.770561, grad 8.262684, lapla
cian 0.017768, dIdt 17118.970508
Epoch 68, Epoch SSIM: pixel 0.018167, grad 0.030976, laplacian 0.093570, dIdt
0.000080
10it [00:28, 2.83s/it]
Epoch 69, Epoch loss: total 17129.415723, pixel 2.773975, grad 8.263167, lapla
cian 0.017772, dIdt 17118.360938
Epoch 69, Epoch SSIM: pixel 0.018171, grad 0.030966, laplacian 0.093504, dIdt
0.000080
10it [00:31, 3.16s/it]
Epoch 70, Epoch loss: total 17128.809082, pixel 2.777395, grad 8.263650, lapla
cian 0.017777, dIdt 17117.750293
Epoch 70, Epoch SSIM: pixel 0.018172, grad 0.030956, laplacian 0.093437, dIdt
0.000080
10it [00:28, 2.88s/it]
Epoch 71, Epoch loss: total 17128.202246, pixel 2.780821, grad 8.264133, lapla
cian 0.017781, dIdt 17117.139648
Epoch 71, Epoch SSIM: pixel 0.018176, grad 0.030945, laplacian 0.093366, dIdt
0.000080
10it [00:28, 2.84s/it]
```

```
Epoch 72, Epoch loss: total 17127.595117, pixel 2.784251, grad 8.264616, lapla
cian 0.017786, dIdt 17116.528516
Epoch 72, Epoch SSIM: pixel 0.018177, grad 0.030935, laplacian 0.093295, dIdt
0.000080
10it [00:28, 2.84s/it]
Epoch 73, Epoch loss: total 17126.988086, pixel 2.787686, grad 8.265100, lapla
cian 0.017790, dIdt 17115.917578
Epoch 73, Epoch SSIM: pixel 0.018179, grad 0.030925, laplacian 0.093227, dIdt
0.000080
10it [00:28, 2.83s/it]
Epoch 74, Epoch loss: total 17126.380371, pixel 2.791127, grad 8.265584, lapla
cian 0.017795, dIdt 17115.305957
Epoch 74, Epoch SSIM: pixel 0.018181, grad 0.030914, laplacian 0.093165, dIdt
0.000080
10it [00:28, 2.88s/it]
Epoch 75, Epoch loss: total 17125.772070, pixel 2.794574, grad 8.266069, lapla
cian 0.017799, dIdt 17114.693750
Epoch 75, Epoch SSIM: pixel 0.018186, grad 0.030904, laplacian 0.093091, dIdt
0.000080
10it [00:28, 2.84s/it]
Epoch 76, Epoch loss: total 17125.163965, pixel 2.798025, grad 8.266553, lapla
cian 0.017804, dIdt 17114.081738
Epoch 76, Epoch SSIM: pixel 0.018189, grad 0.030894, laplacian 0.093030, dIdt
0.000080
10it [00:28, 2.86s/it]
Epoch 77, Epoch loss: total 17124.554785, pixel 2.801481, grad 8.267038, lapla
cian 0.017808, dIdt 17113.468652
Epoch 77, Epoch SSIM: pixel 0.018190, grad 0.030884, laplacian 0.092957, dIdt
0.000080
10it [00:28, 2.84s/it]
Epoch 78, Epoch loss: total 17123.946777, pixel 2.804943, grad 8.267523, lapla
cian 0.017813, dIdt 17112.856445
Epoch 78, Epoch SSIM: pixel 0.018193, grad 0.030874, laplacian 0.092879, dIdt
0.000080
10it [00:29, 2.91s/it]
Epoch 79, Epoch loss: total 17123.337305, pixel 2.808410, grad 8.268009, lapla
cian 0.017817, dIdt 17112.243164
Epoch 79, Epoch SSIM: pixel 0.018194, grad 0.030863, laplacian 0.092812, dIdt
0.000081
10it [00:31, 3.18s/it]
Epoch 80, Epoch loss: total 17122.727832, pixel 2.811882, grad 8.268495, lapla
cian 0.017822, dIdt 17111.629688
Epoch 80, Epoch SSIM: pixel 0.018198, grad 0.030853, laplacian 0.092737, dIdt
0.000081
-----Finished-----
-----Generating Data-----
100%|██████████| 10/10 [00:00<00:00, 1215.07it/s]
-----Finished-----
```

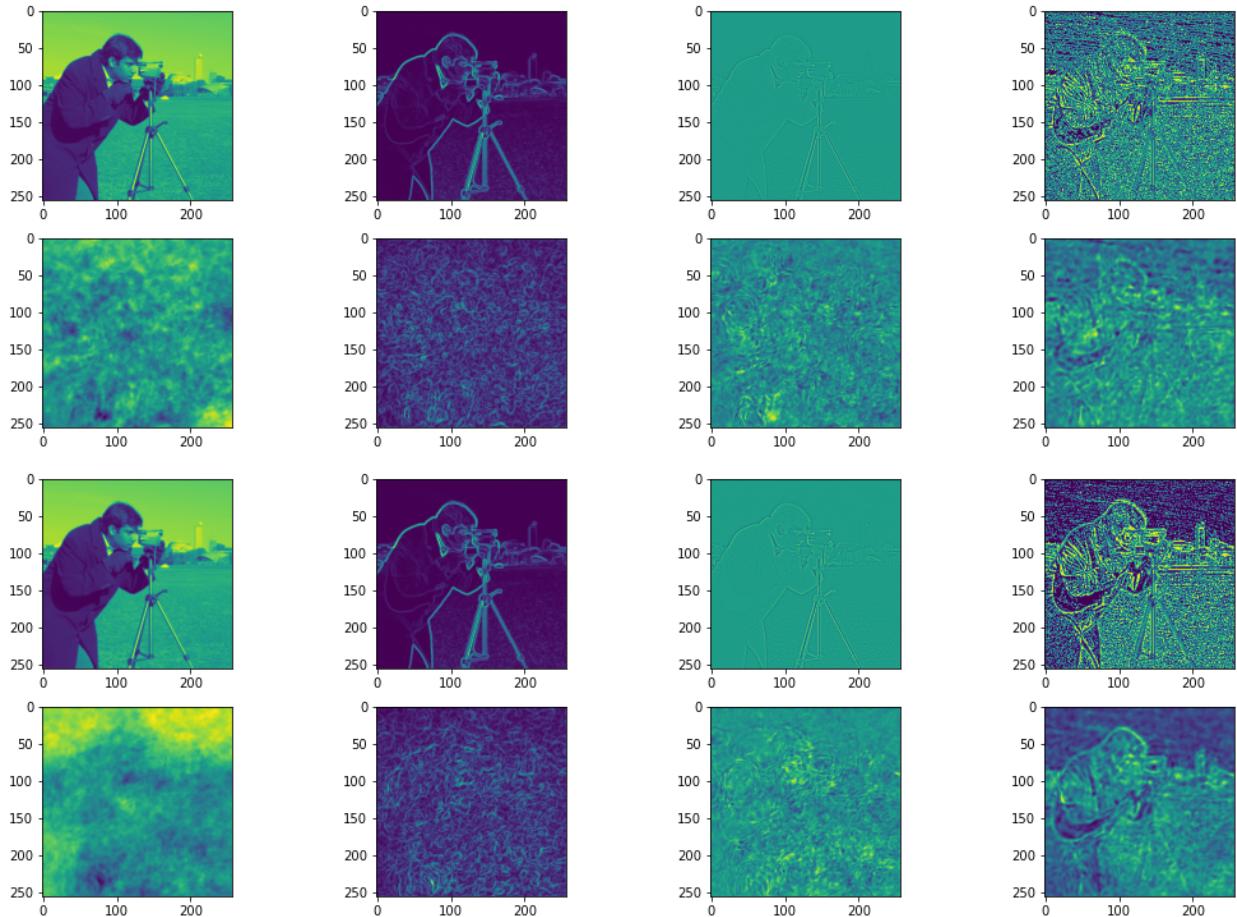
```

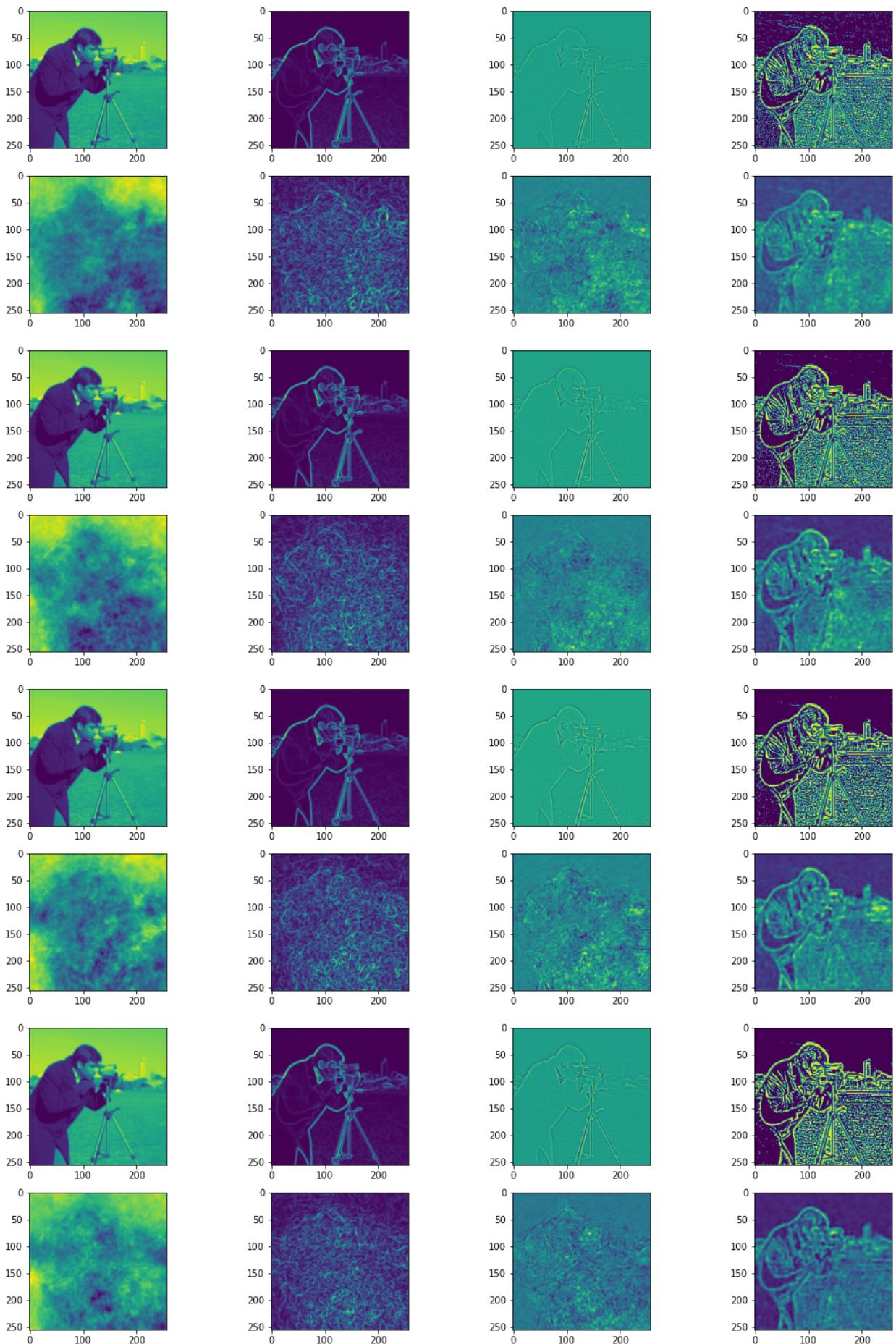
10it [00:18,  1.84s/it]
ffmpeg version 4.1.9-0+deb10u1 Copyright (c) 2000-2022 the FFmpeg developers
  built with gcc 8 (Debian 8.3.0-6)
  configuration: --prefix=/usr --extra-version=0+deb10u1 --toolchain=hardened
  --libdir=/usr/lib/x86_64-linux-gnu --incdir=/usr/include/x86_64-linux-gnu --arch=amd64 --enable-gpl --disable-stripping --enable-avresample --disable-filter=resample --enable-avisynth --enable-gnutls --enable-ladspa --enable-libaom --enable-libass --enable-libbluray --enable-libbs2b --enable-libcaca --enable-libcdio --enable-libcodec2 --enable-libflite --enable-libfontconfig --enable-libfreetype --enable-libfribidi --enable-libgme --enable-libgsm --enable-libjack --enable-libmp3lame --enable-libmysofa --enable-libopenjpeg --enable-libopenmp3 --enable-libopus --enable-libpulse --enable-librsvg --enable-librubberband --enable-libshine --enable-libsnappy --enable-libsoxr --enable-libspeex --enable-libssh --enable-libtheora --enable-libtwolame --enable-libvidstab --enable-libvorbis --enable-libvpx --enable-libwavpack --enable-libwebp --enable-libx265 --enable-libxml2 --enable-libxvid --enable-libzmq --enable-libzvbi --enable-lv2 --enable-omx --enable-openal --enable-opengl --enable-sdl2 --enable-libdc1394 --enable-libdrm --enable-libiec61883 --enable-chromaprint --enable-frei0r --enable-libx264 --enable-shared
  libavutil      56. 22.100 / 56. 22.100
  libavcodec     58. 35.100 / 58. 35.100
  libavformat    58. 20.100 / 58. 20.100
  libavdevice     58.  5.100 / 58.  5.100
  libavfilter     7. 40.101 /  7. 40.101
  libavresample   4.  0.  0 /  4.  0.  0
  libswscale      5.  3.100 /  5.  3.100
  libswresample   3.  3.100 /  3.  3.100
  libpostproc    55.  3.100 / 55.  3.100
Input #0, image2, from 'tmp/file%02d.png':
  Duration: 00:00:05.00, start: 0.000000, bitrate: N/A
    Stream #0:0: Video: png, rgba(pc), 1296x432 [SAR 2835:2835 DAR 3:1], 2 fps, 2 tbr, 2 tbn, 2 tbc
    Stream mapping:
      Stream #0:0 -> #0:0 (png (native) -> h264 (libx264))
Press [q] to stop, [?] for help
[libx264 @ 0x55ab9e88bf00] using SAR=1/1
[libx264 @ 0x55ab9e88bf00] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2 AVX FMA3 BMI2 AVX2
[libx264 @ 0x55ab9e88bf00] profile High, level 3.1
[libx264 @ 0x55ab9e88bf00] 264 - core 155 r2917 0a84d98 - H.264/MPEG-4 AVC codec - Copyleft 2003-2018 - http://www.videolan.org/x264.html - options: cabac=1 ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00:0.00 mixed_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast_pskip=1 chroma_qp_offset=-2 threads=3 lookahead_threads=1 sliced_threads=0 nr=0 decimate=1 interlaced=0 bluray_compat=0 constrained_intra=0 bframes=3 b_pyr amid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 keyint_min=25 scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=2.3.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ratio=1.40 aq=1:1.00
Output #0, mp4, to '/home/jupyter/videos/runs/cameraman/experiments/elu_decay_multi_le-04_video.mp4':
  Metadata:
    encoder : Lavf58.20.100
  Stream #0:0: Video: h264 (libx264) (avc1 / 0x31637661), yuv420p, 1296x432 [SAR 1:1 DAR 3:1], q=-1--1, 30 fps, 15360 tbn, 30 tbc
  Metadata:
    encoder : Lavc58.35.100 libx264
  Side data:
    cpb: bitrate max/min/avg: 0/0/0 buffer size: 0 vbv_delay: -1
    frame= 150 fps=106 q=-1.0 Lsize= 157kB time=00:00:04.90 bitrate= 263.0kbit/s dup=140 drop=0 speed=3.45x

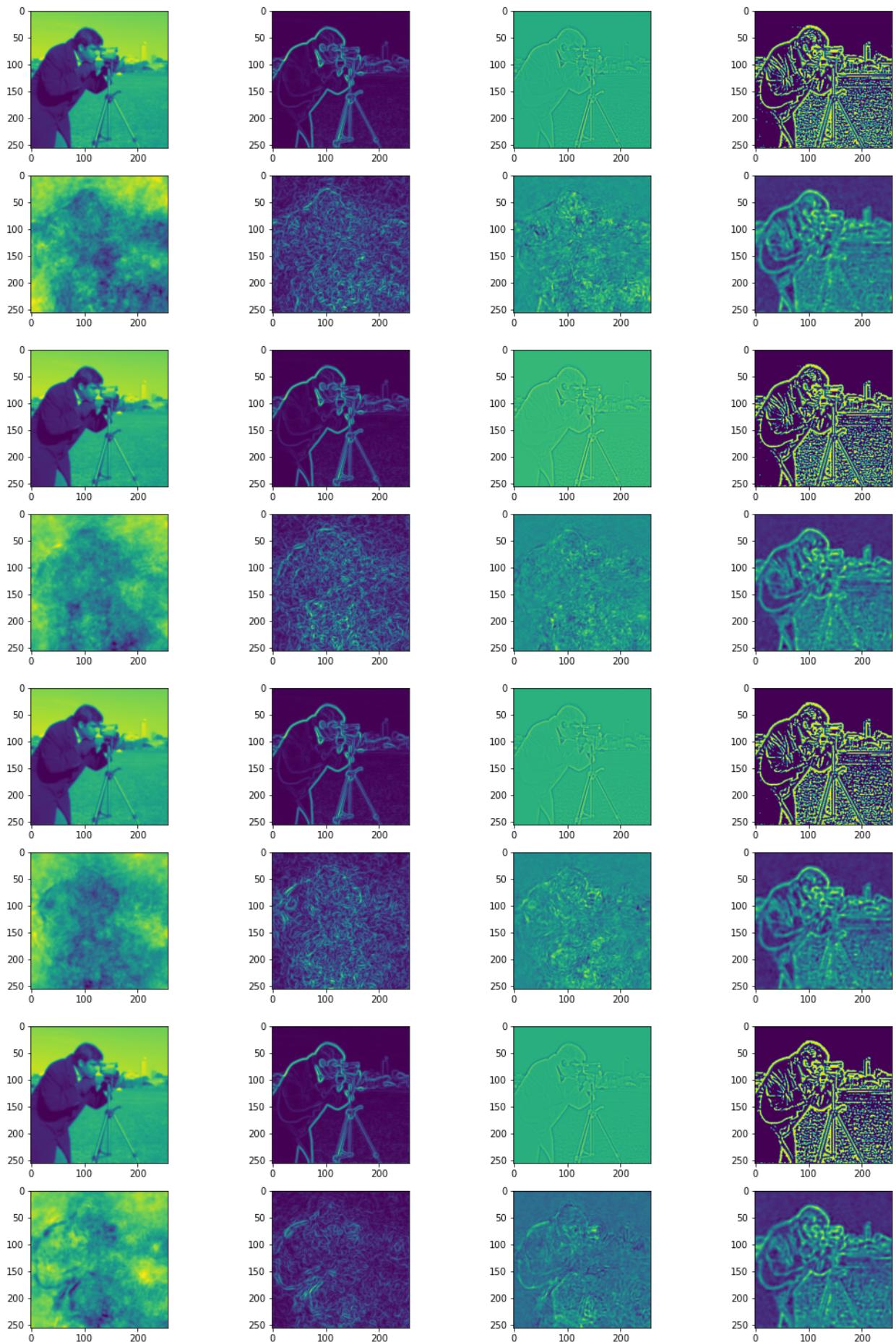
```

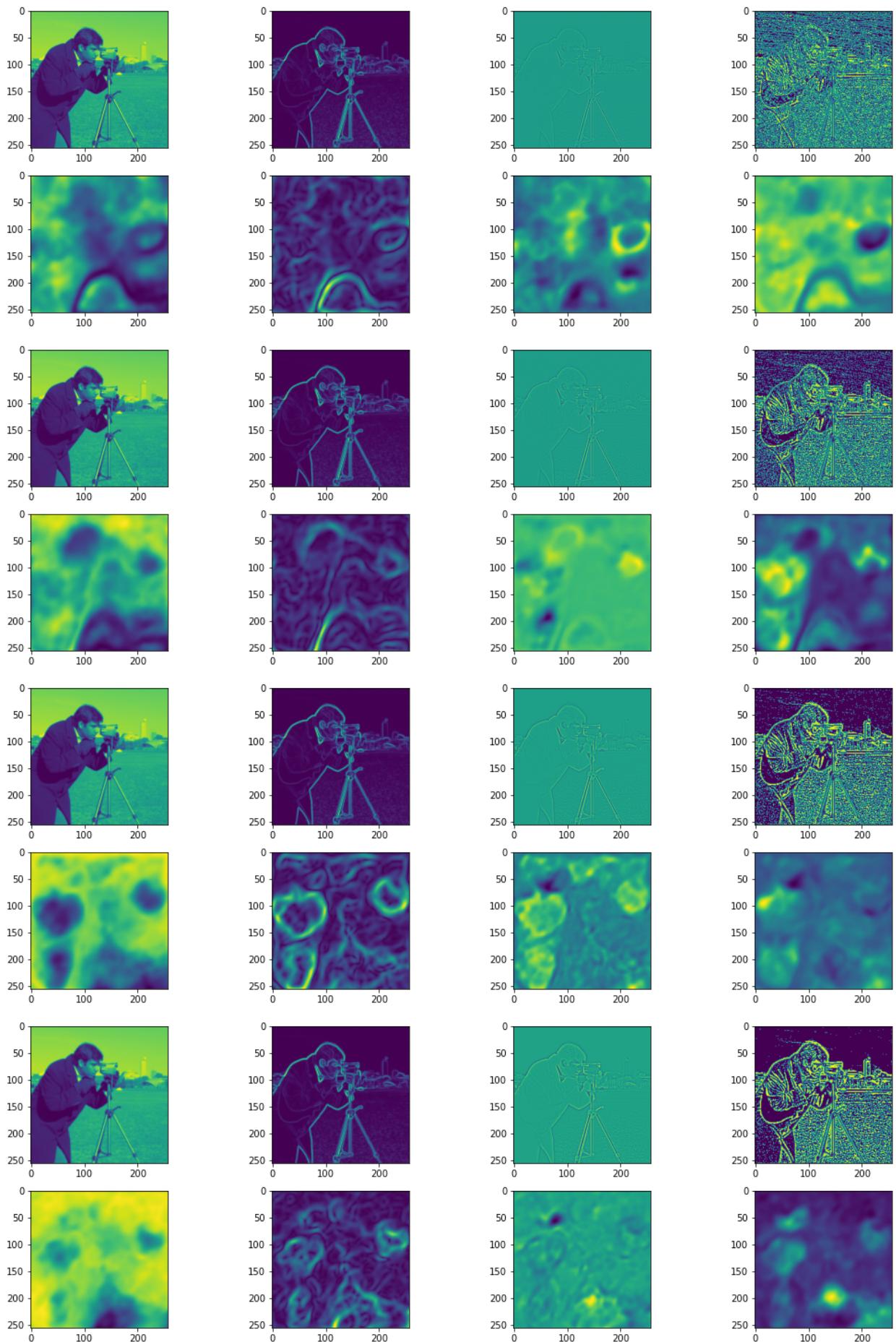
```
video:155kB audio:0kB subtitle:0kB other streams:0kB global headers:0kB muxing overhead: 1.673587%
[libx264 @ 0x55ab9e88bf00] frame I:1      Avg QP:17.57  size: 40742
[libx264 @ 0x55ab9e88bf00] frame P:38     Avg QP:19.00  size: 2851
[libx264 @ 0x55ab9e88bf00] frame B:111    Avg QP:14.97  size:    78
[libx264 @ 0x55ab9e88bf00] consecutive B-frames: 1.3% 0.0% 0.0% 98.7%
[libx264 @ 0x55ab9e88bf00] mb I  I16..4: 50.7% 25.0% 24.4%
[libx264 @ 0x55ab9e88bf00] mb P  I16..4:  0.7%  0.6%  0.2%  P16..4:  5.3%  1.4% 1.1% 0.0% 0.0%  skip:90.7%
[libx264 @ 0x55ab9e88bf00] mb B  I16..4:  0.1%  0.0%  0.0%  B16..8:  2.6%  0.0% 0.0%  direct: 0.0%  skip:97.3%  L0:43.0%  L1:56.8%  BI: 0.1%
[libx264 @ 0x55ab9e88bf00] 8x8 transform intra:29.3% inter:63.9%
[libx264 @ 0x55ab9e88bf00] coded y,uvDC,uvAC intra: 28.1% 44.4% 33.2% inter: 0.7% 1.3% 0.5%
[libx264 @ 0x55ab9e88bf00] i16 v,h,dc,p: 55% 19% 6% 19%
[libx264 @ 0x55ab9e88bf00] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 34% 11% 28% 6% 2% 3% 3% 7% 5%
[libx264 @ 0x55ab9e88bf00] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 29% 27% 19% 6% 3% 4% 4% 4% 4%
[libx264 @ 0x55ab9e88bf00] i8c dc,h,v,p: 52% 17% 15% 16%
[libx264 @ 0x55ab9e88bf00] Weighted P-Frames: Y:0.0% UV:0.0%
[libx264 @ 0x55ab9e88bf00] ref P L0: 80.4% 12.7% 6.2% 0.7%
[libx264 @ 0x55ab9e88bf00] ref B L0: 75.6% 23.9% 0.5%
[libx264 @ 0x55ab9e88bf00] ref B L1: 97.9% 2.1%
[libx264 @ 0x55ab9e88bf00] kb/s:252.44
```

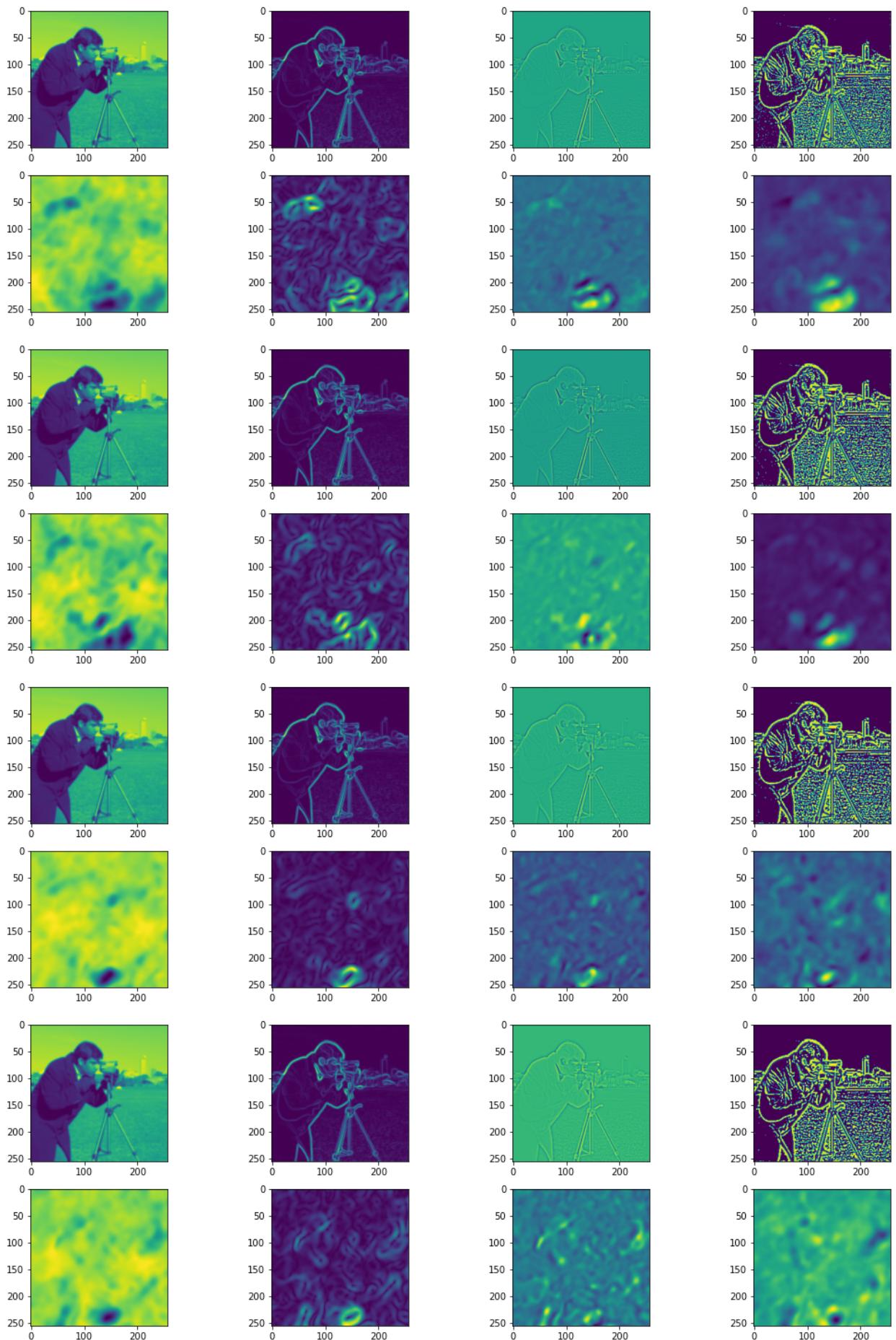
finished experiment # 1

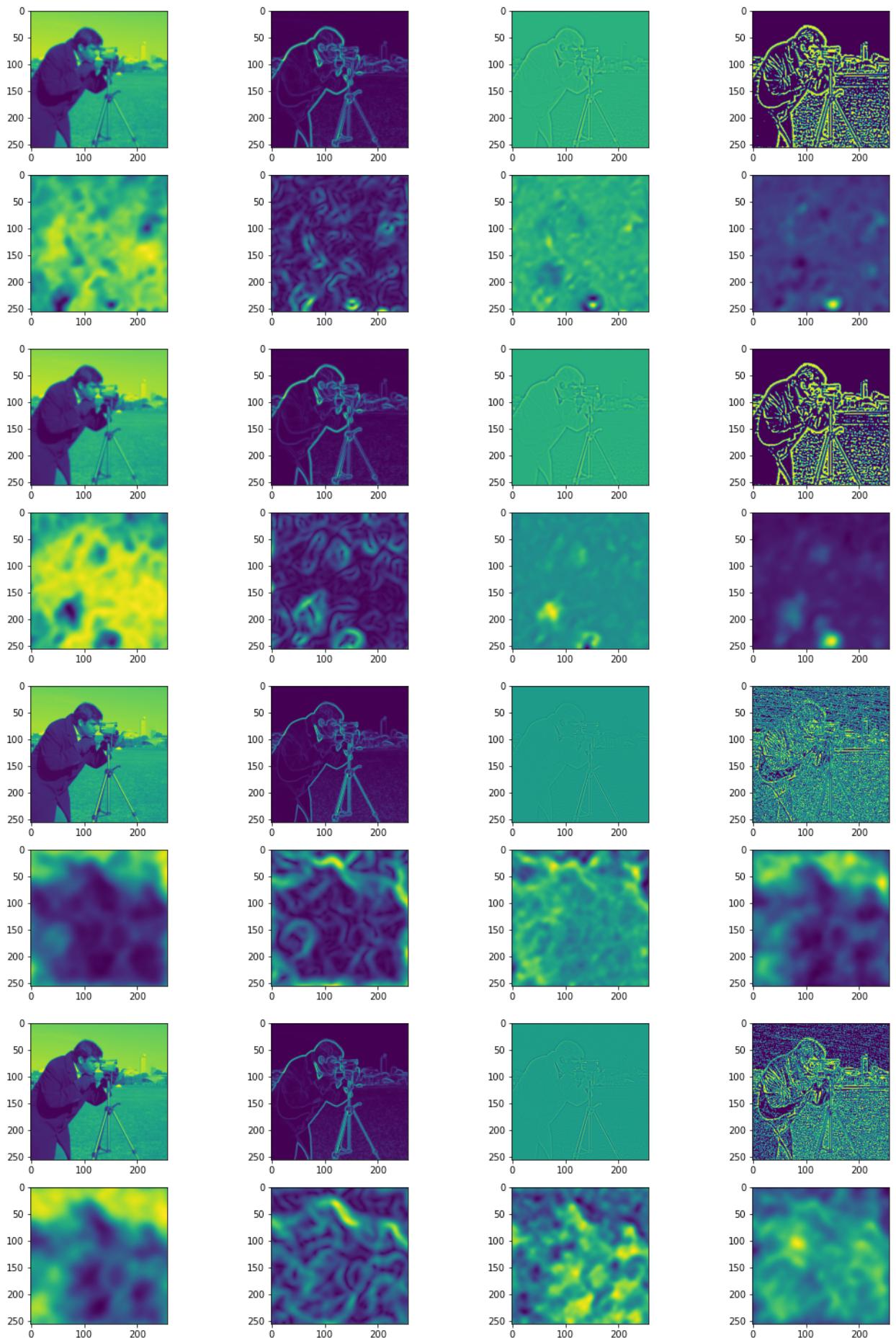


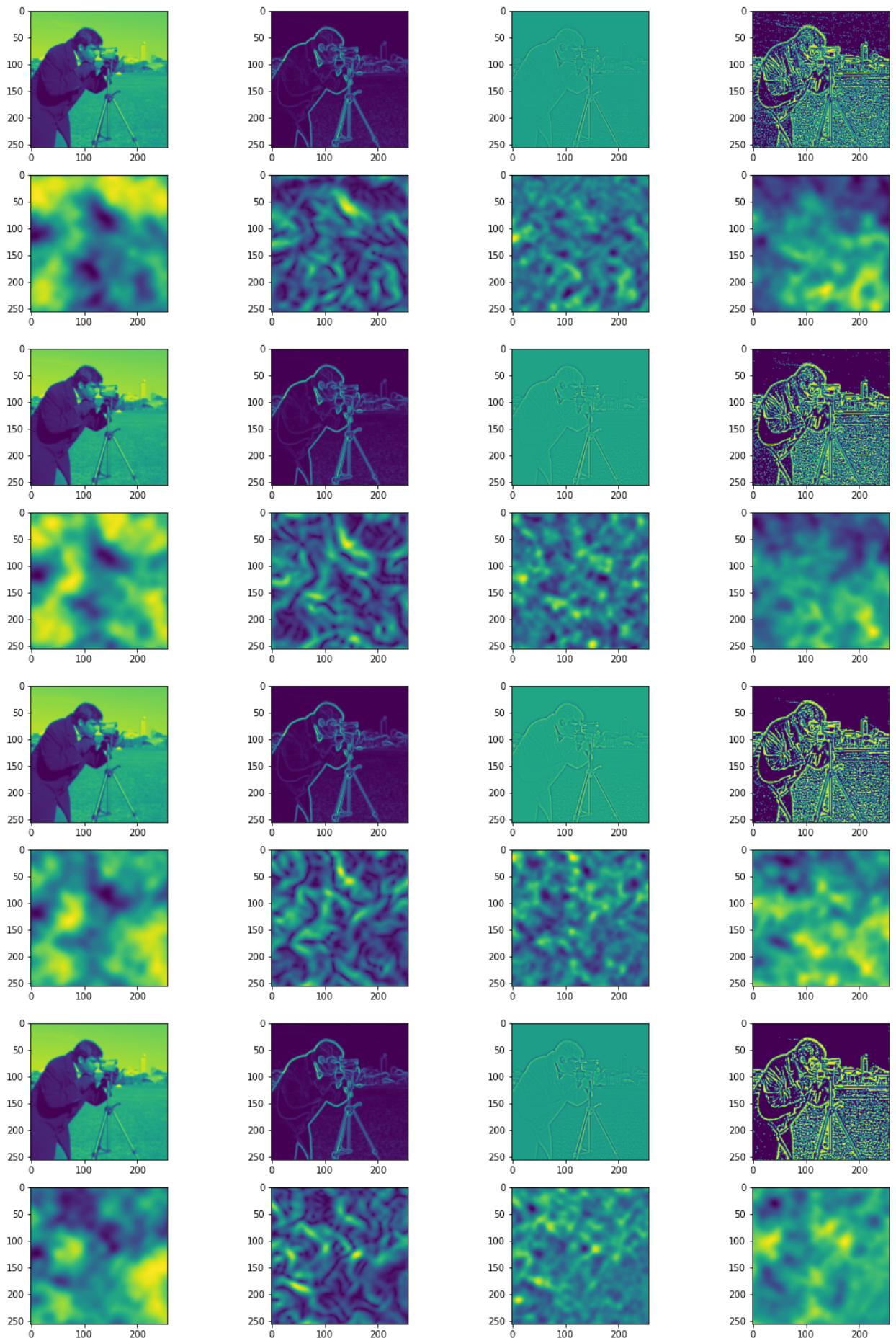


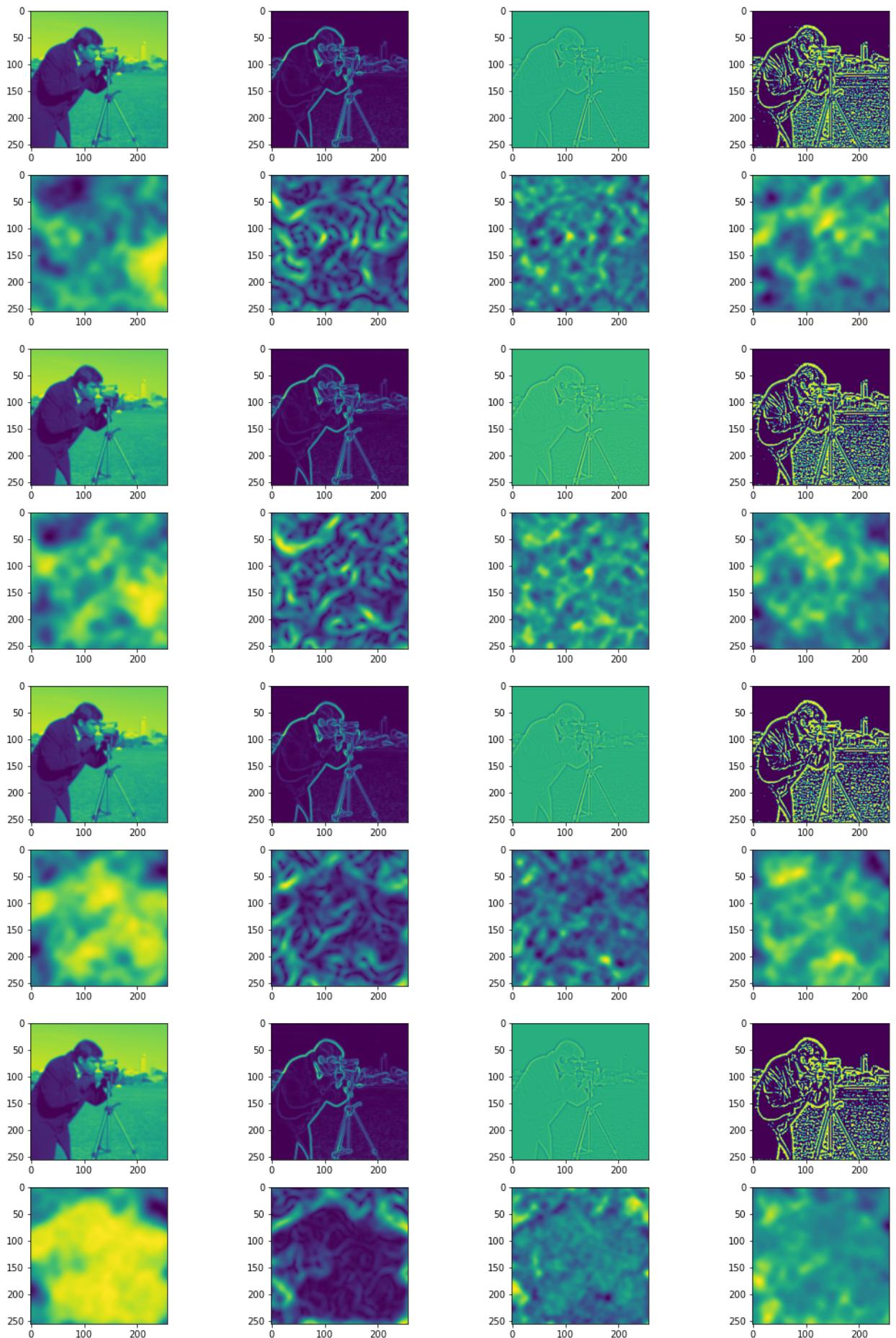


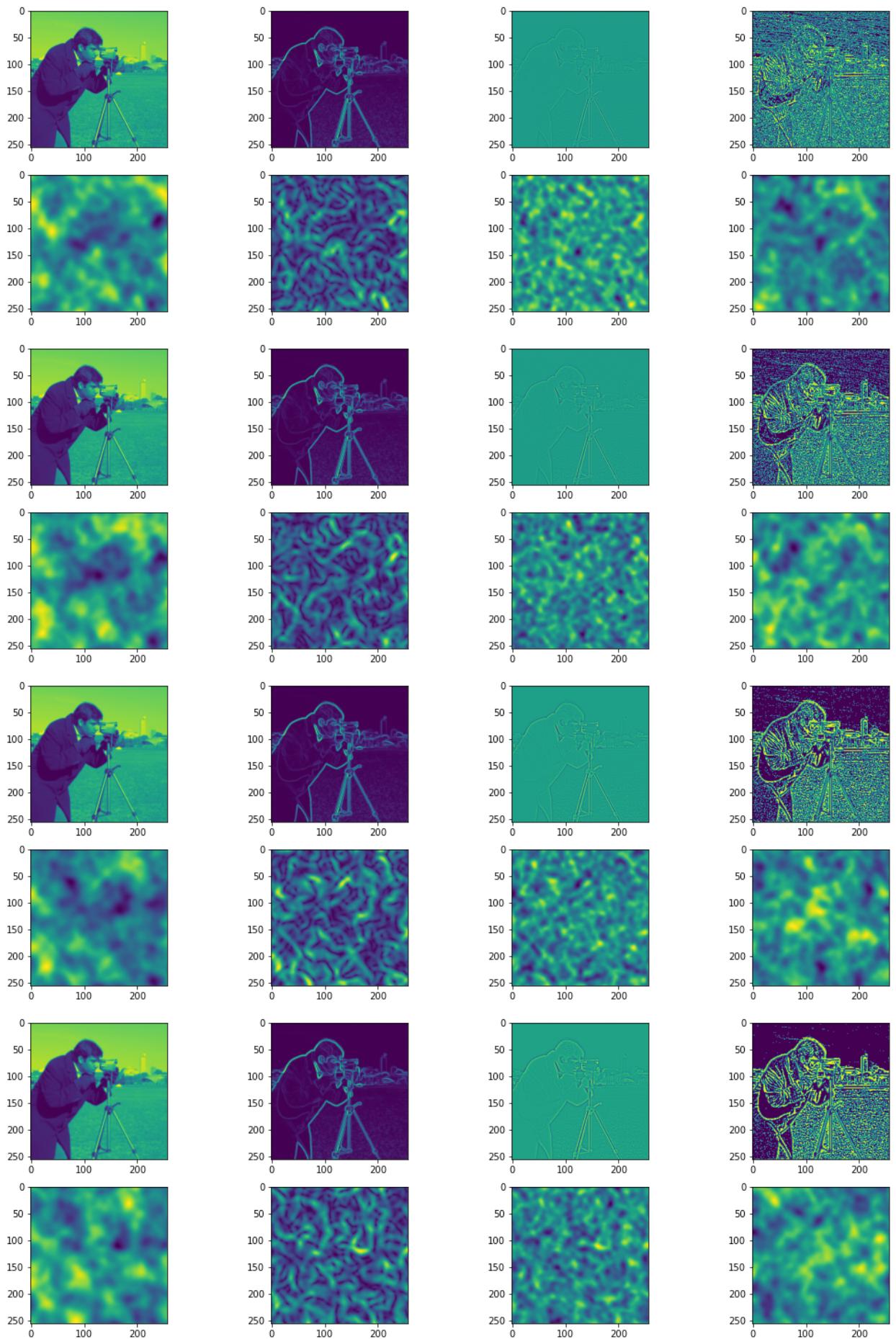


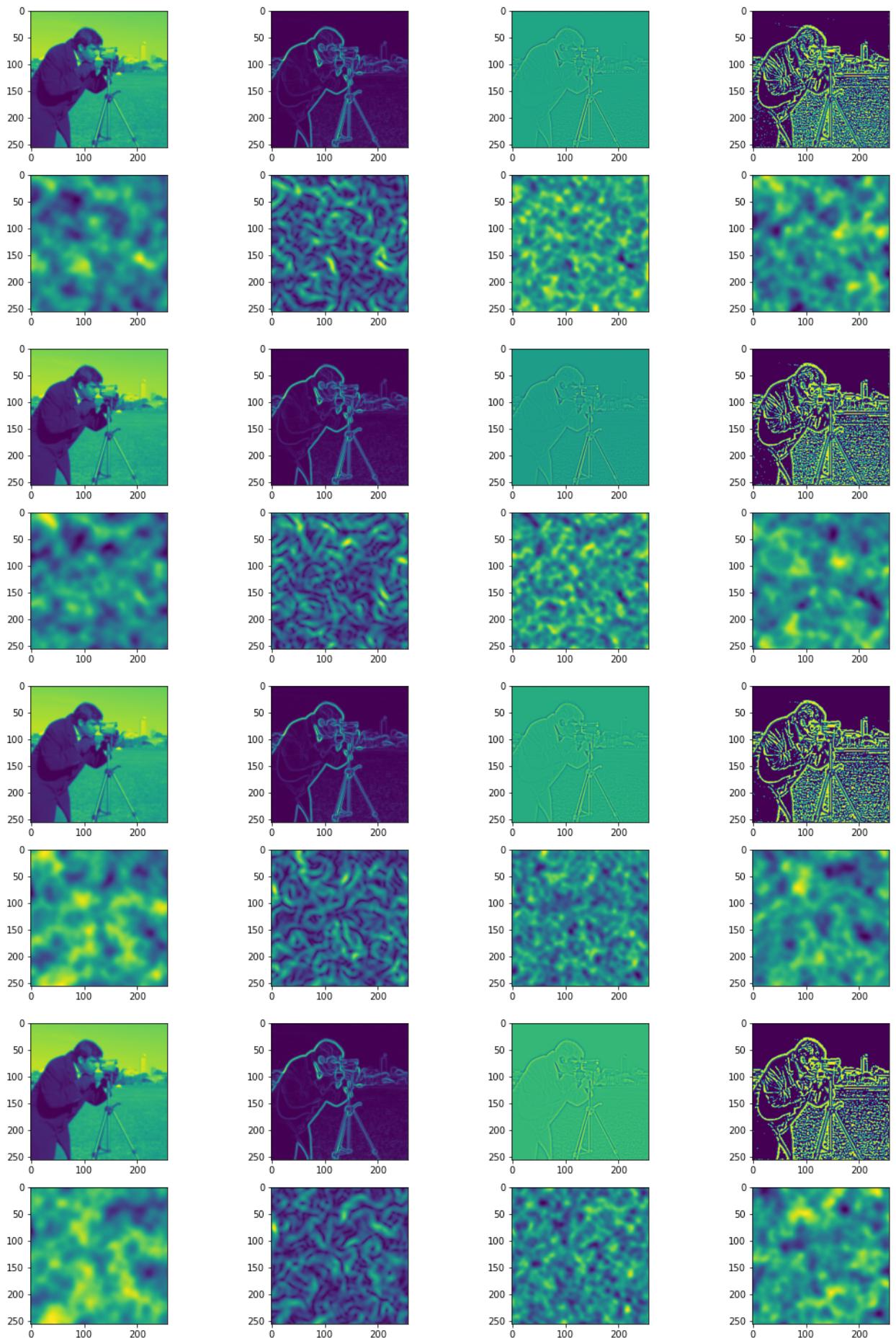


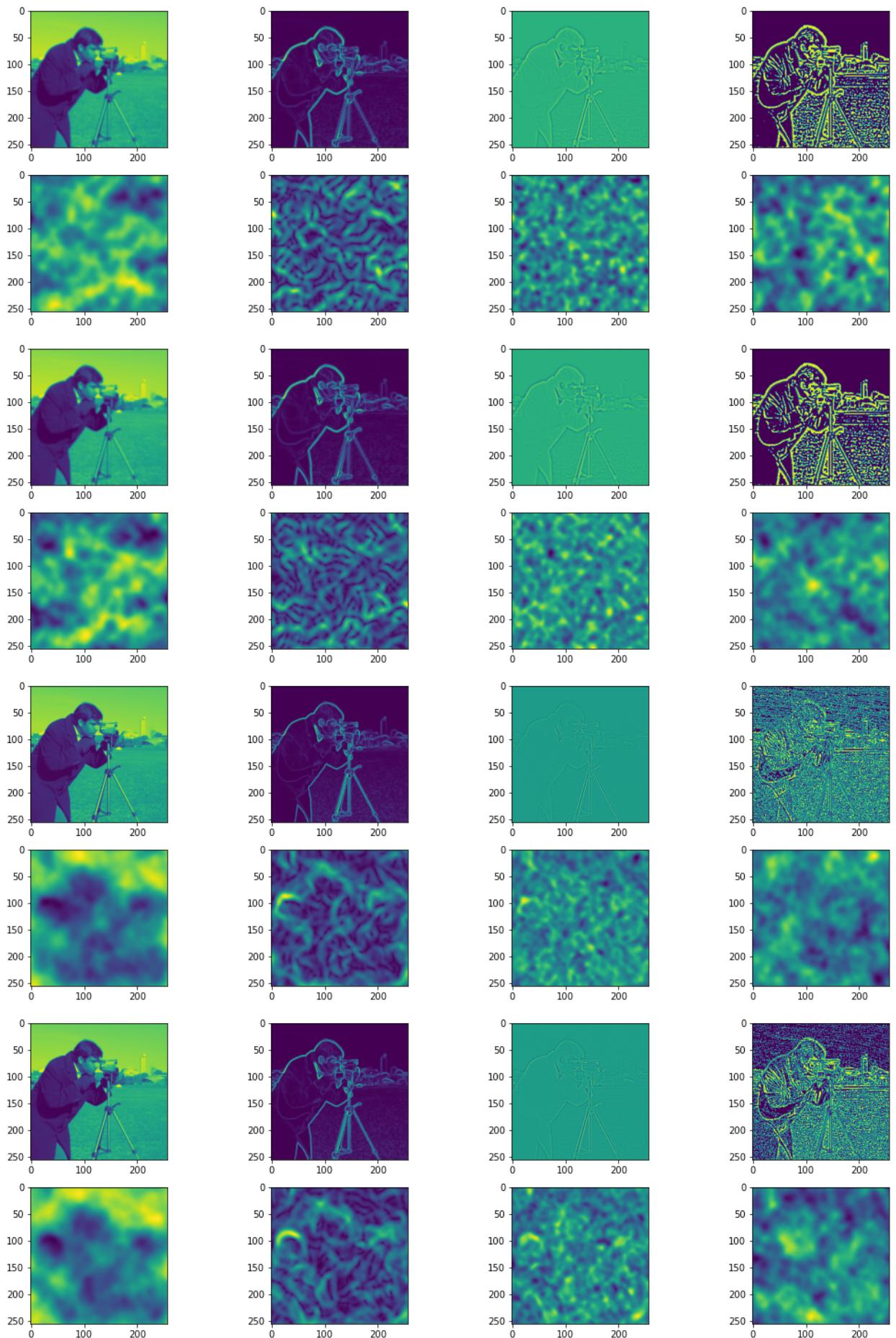


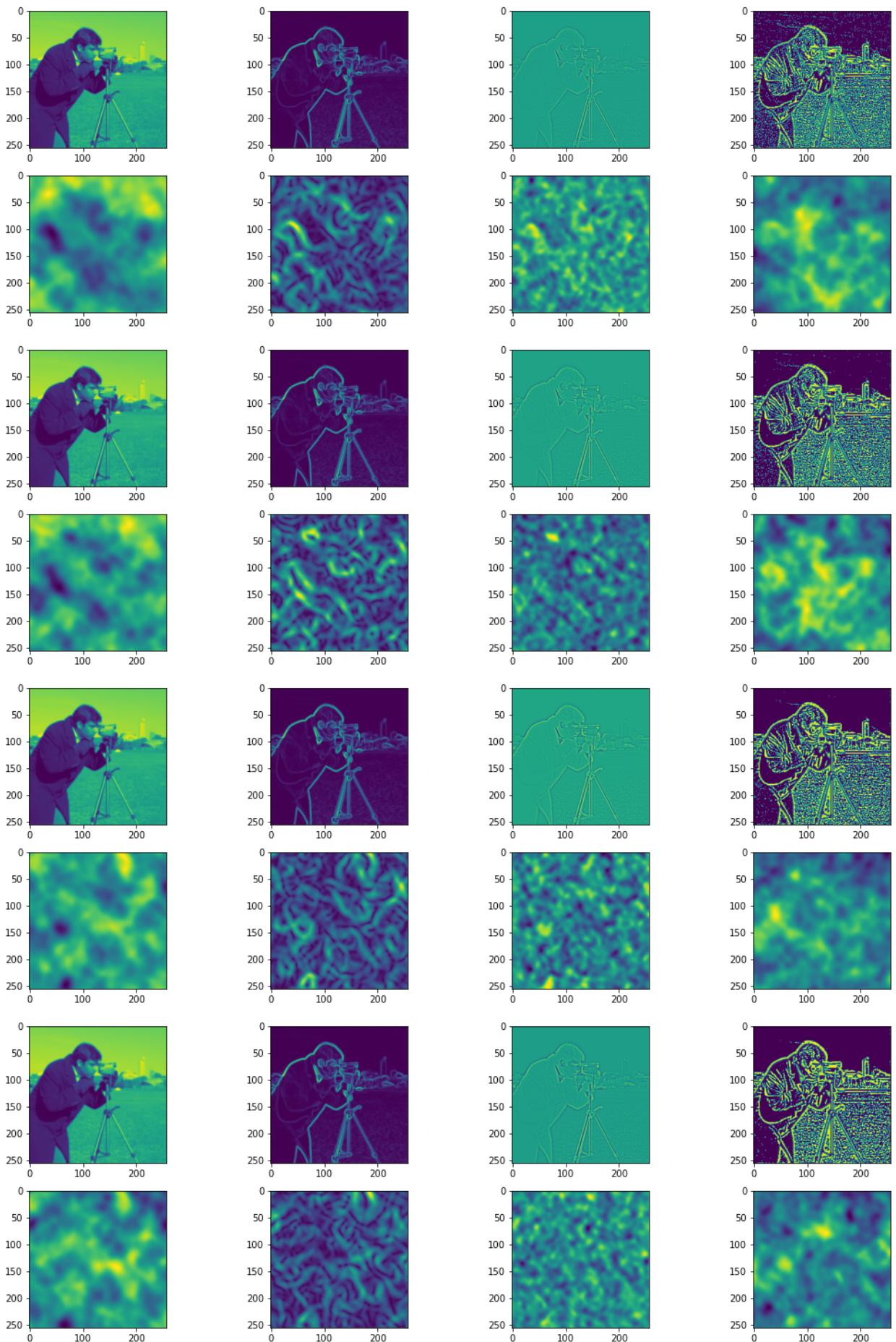


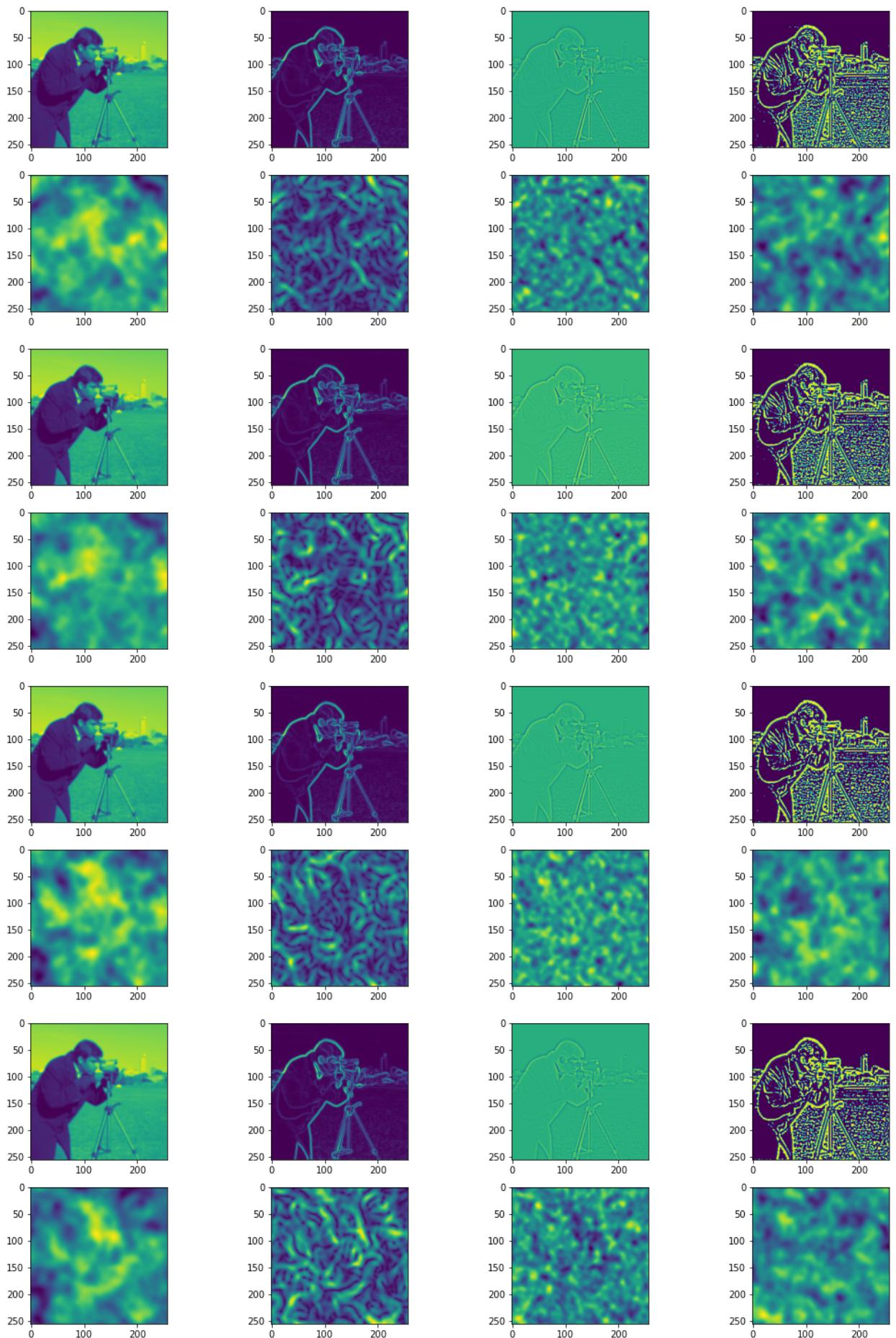


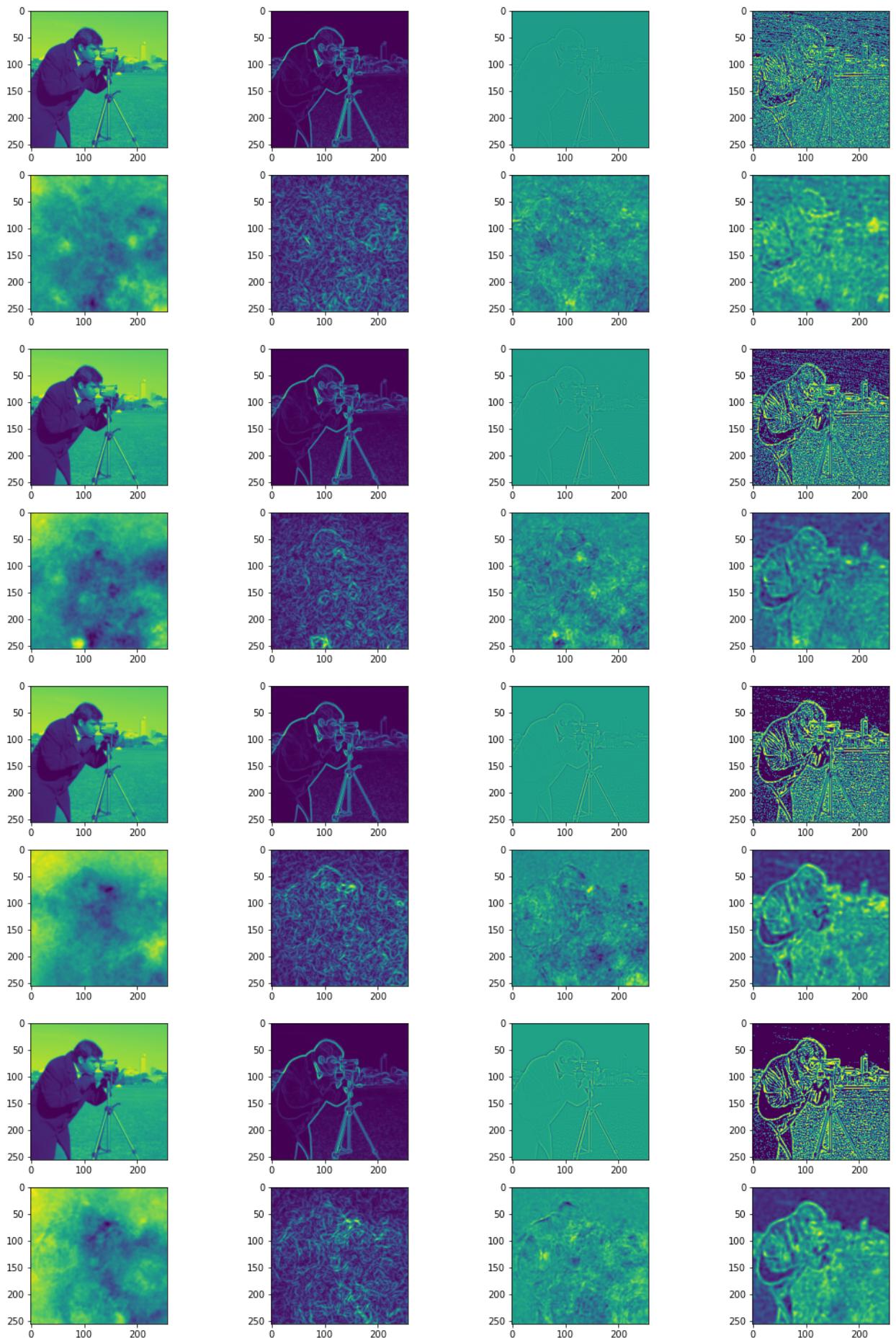


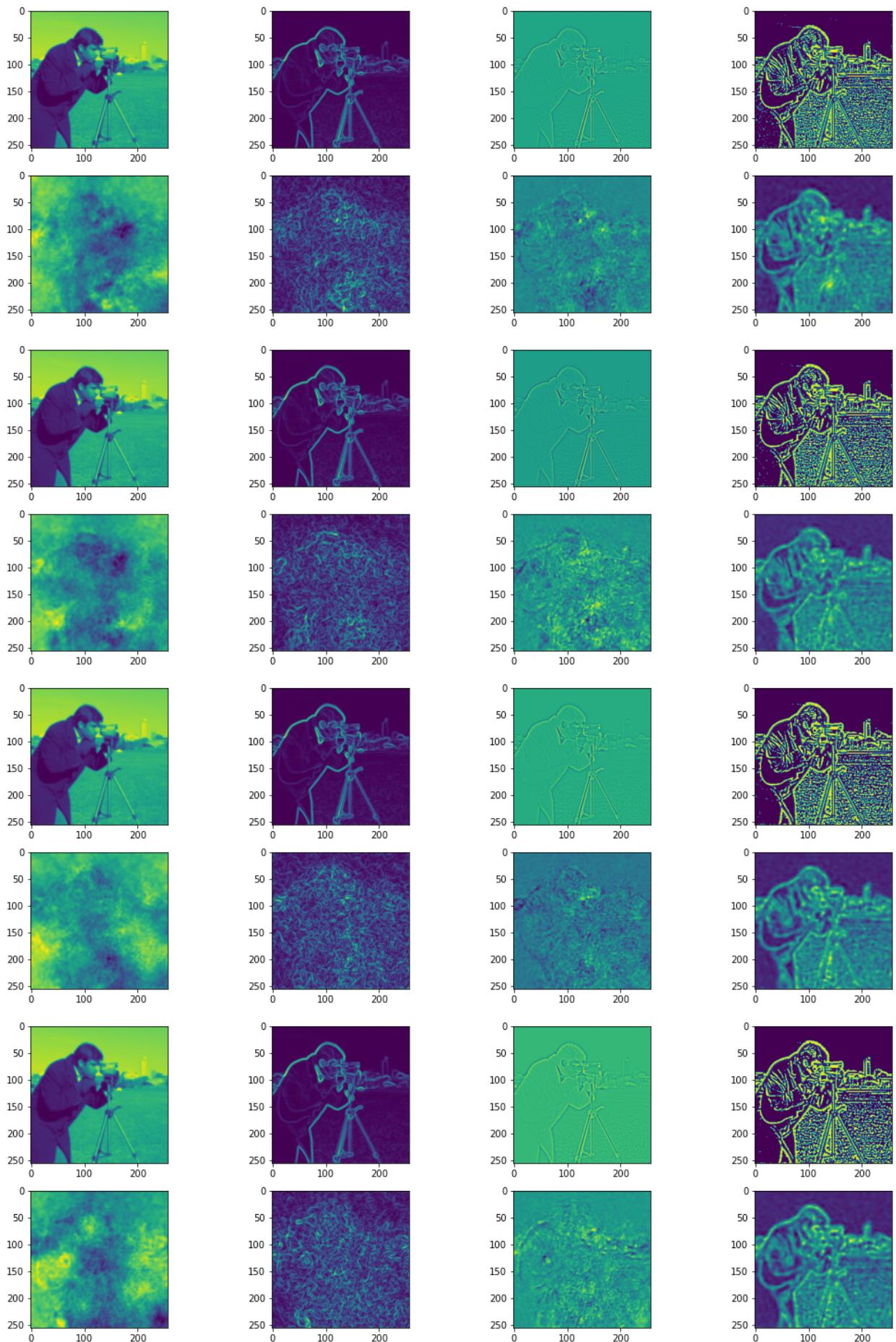


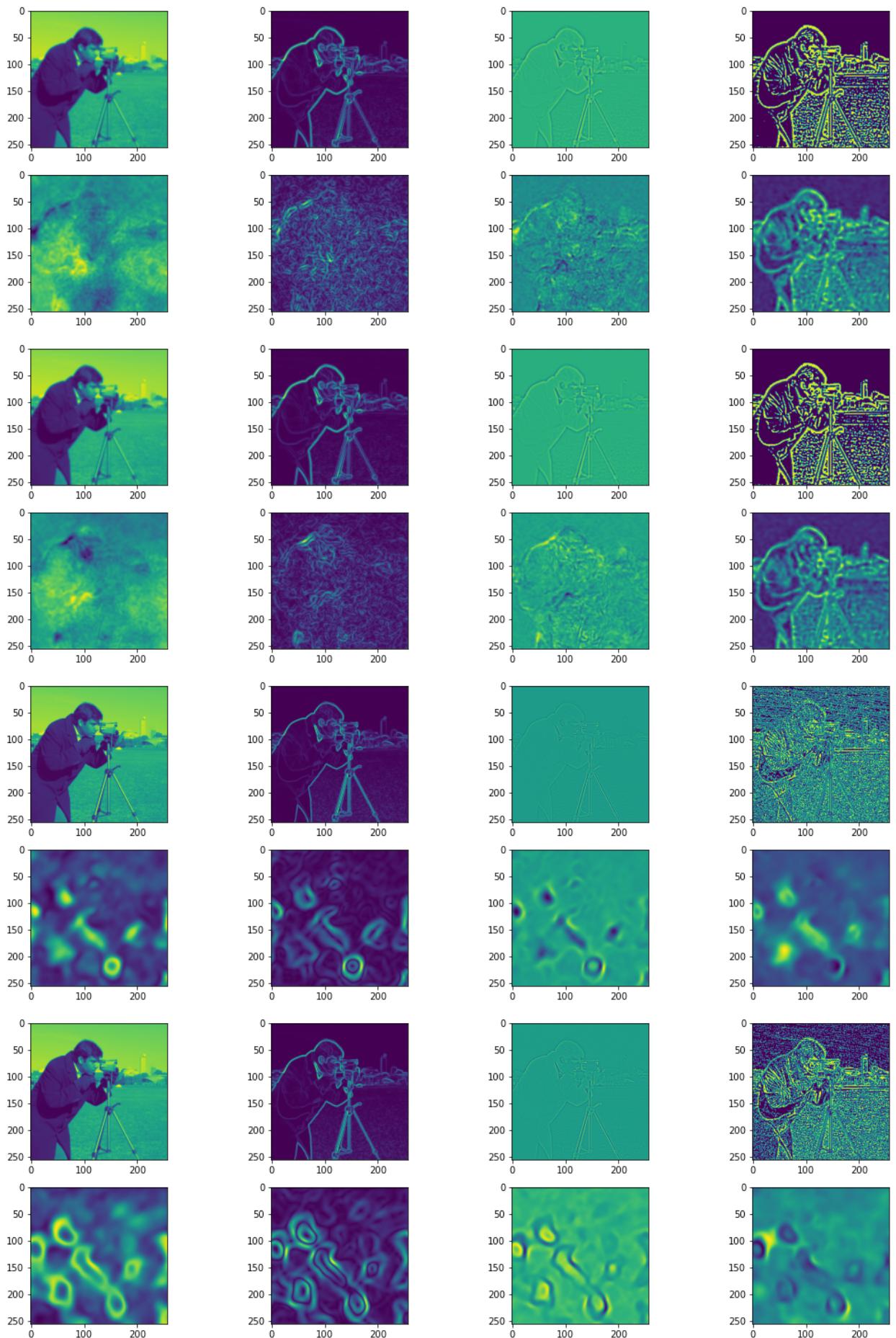


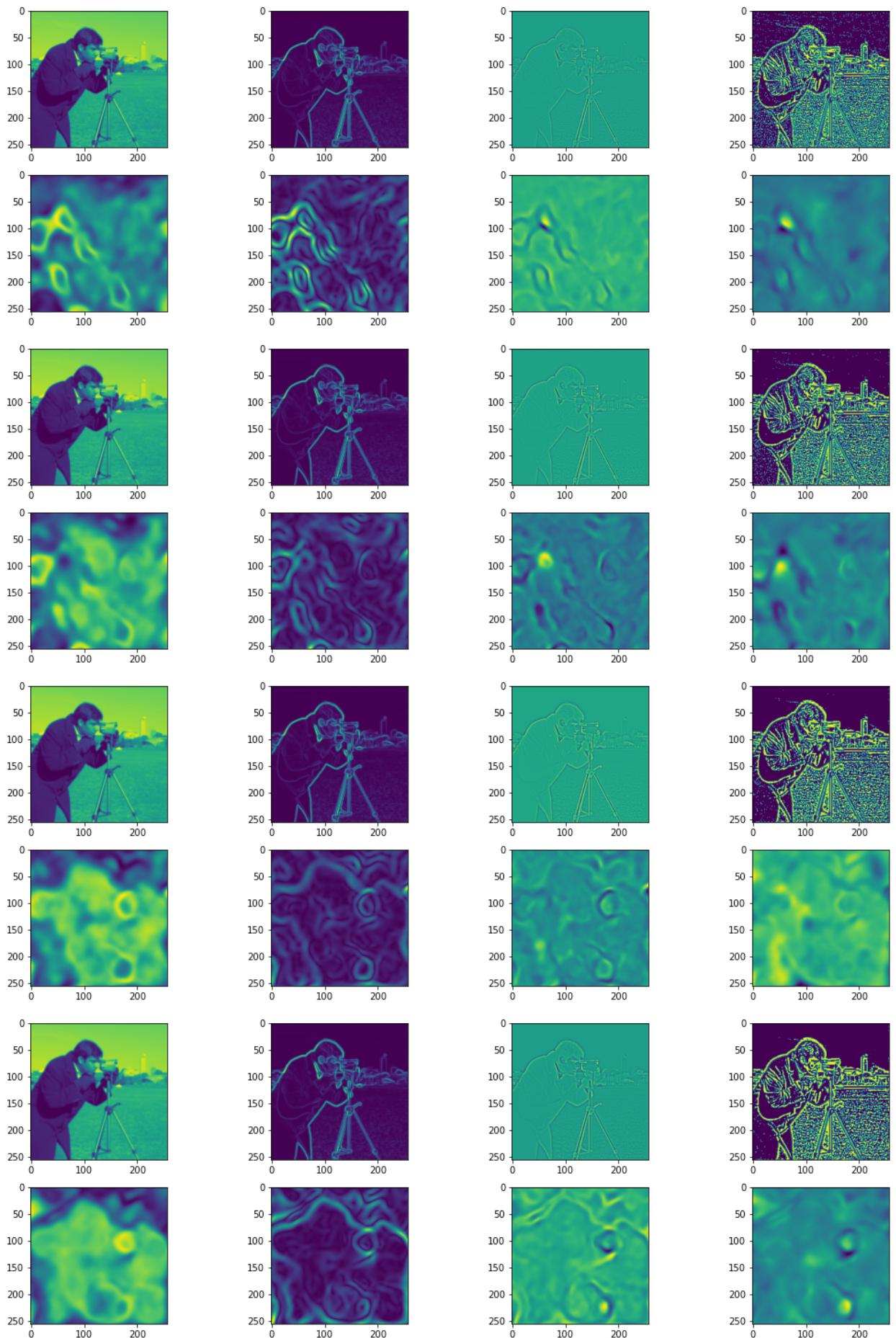


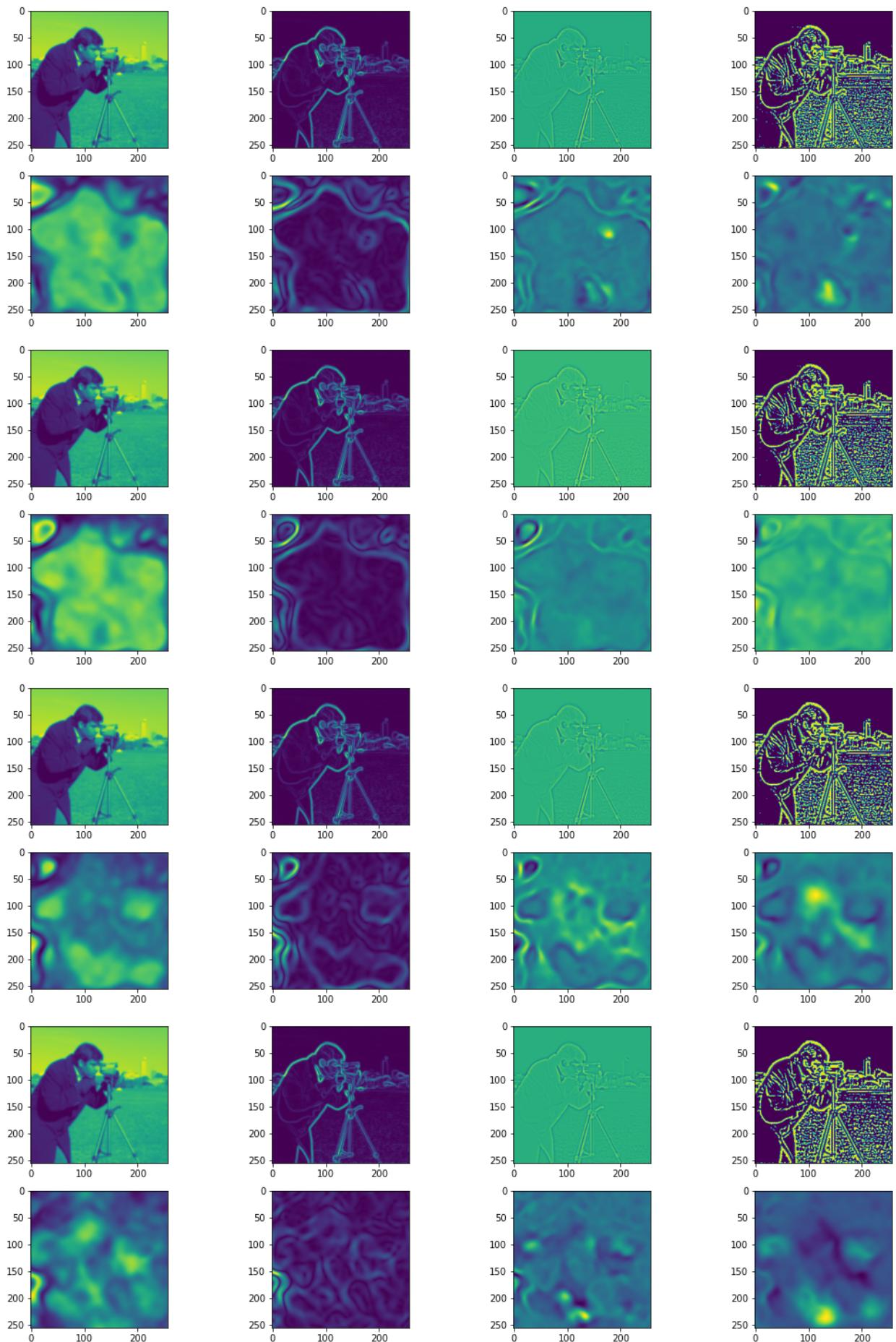


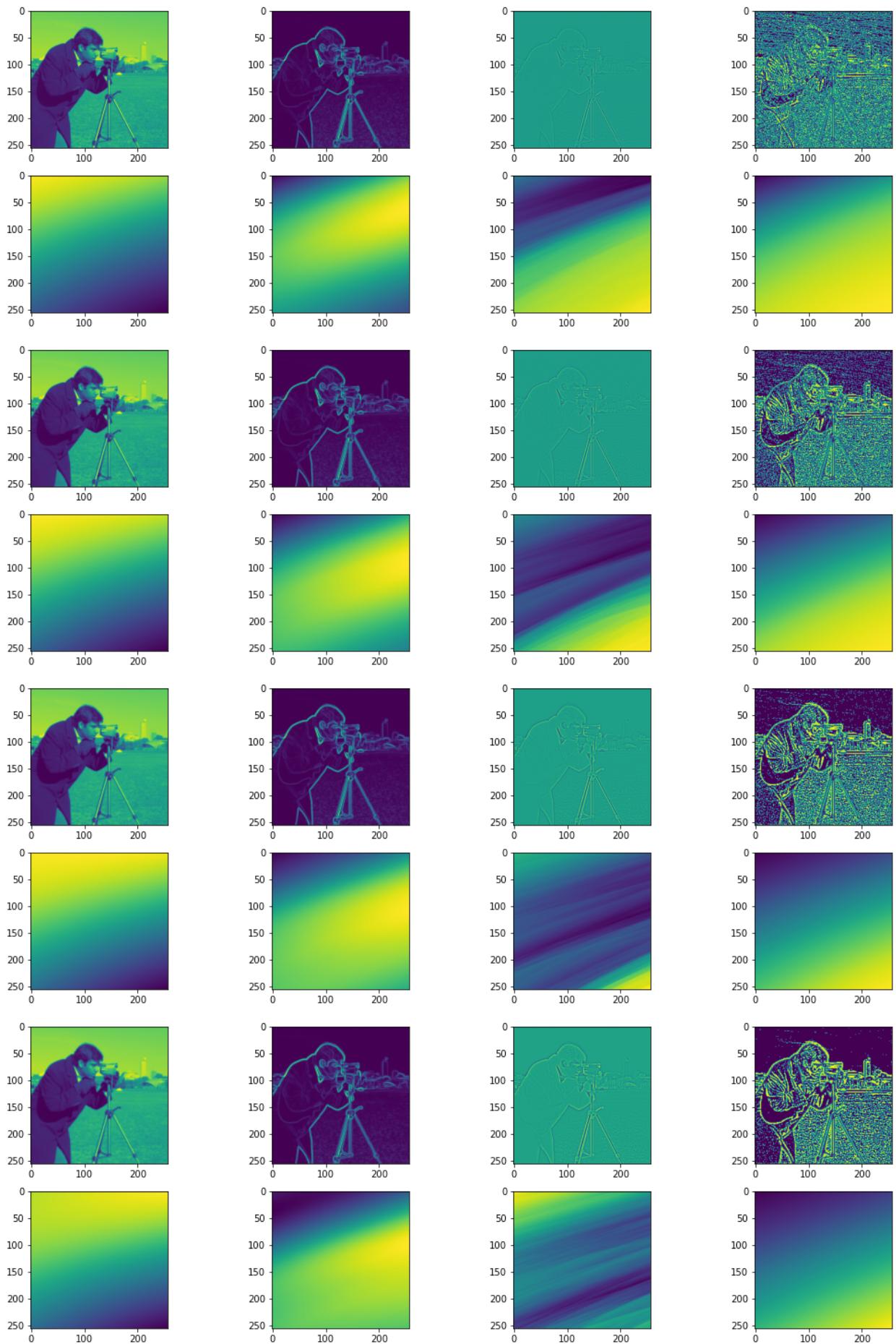


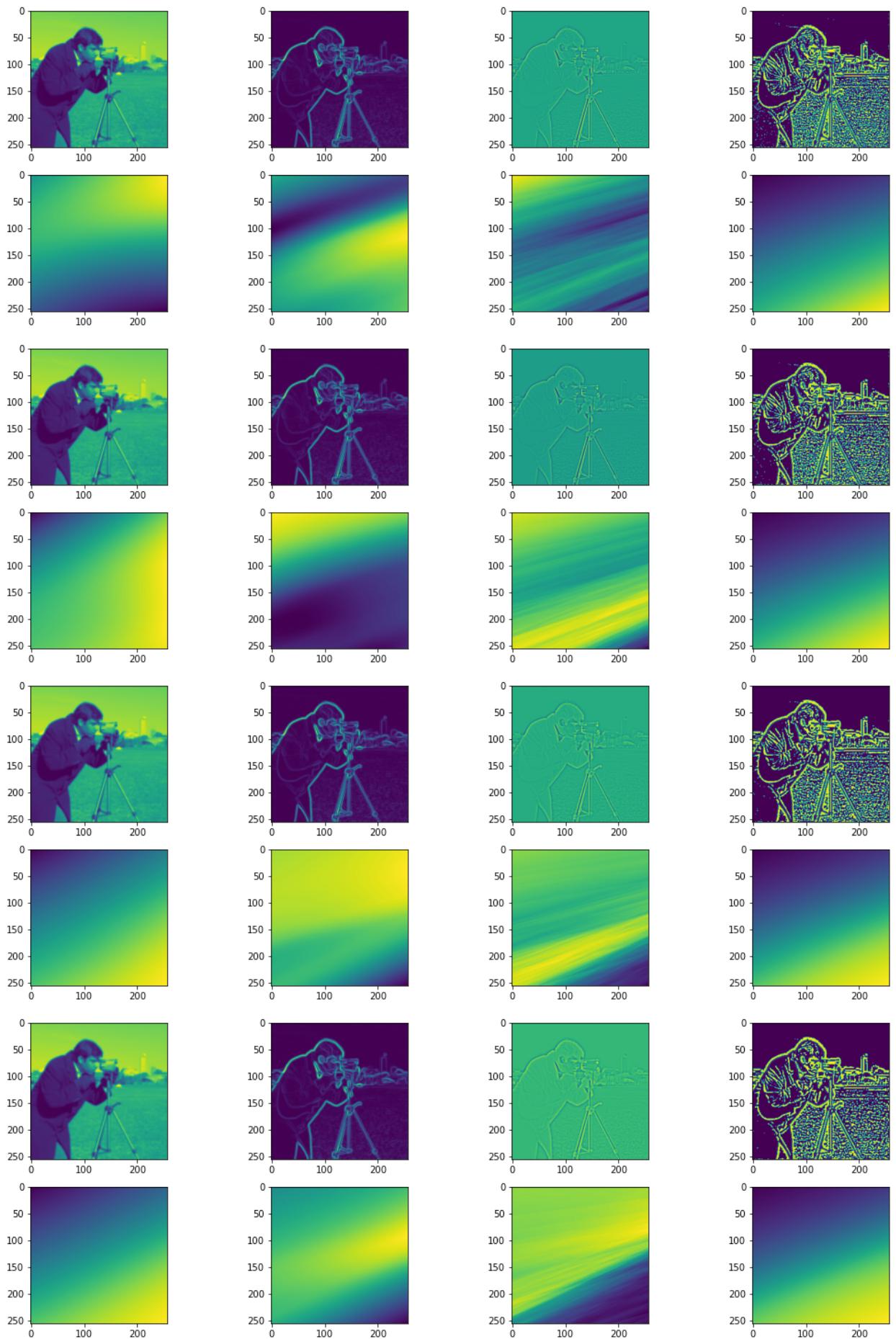


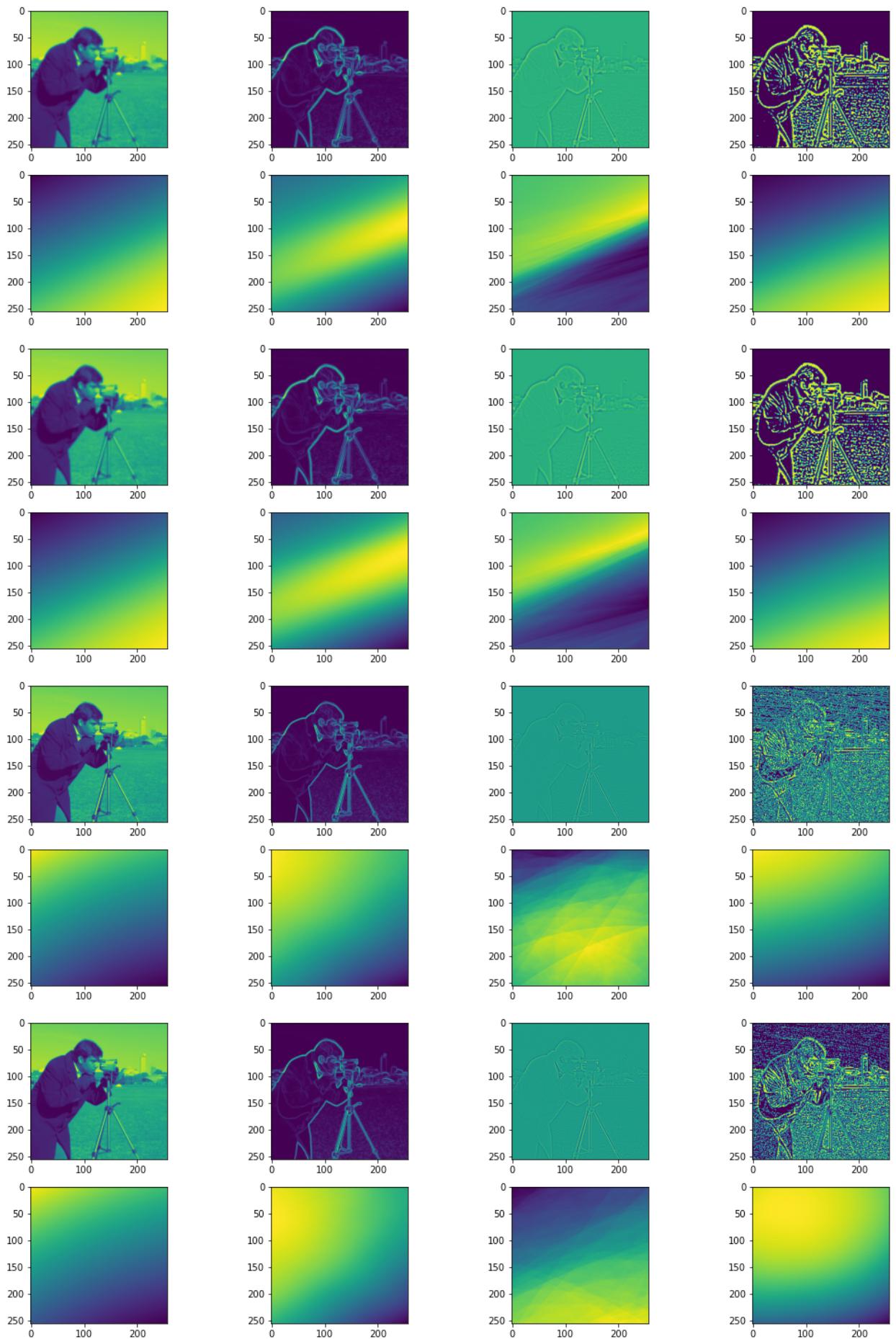


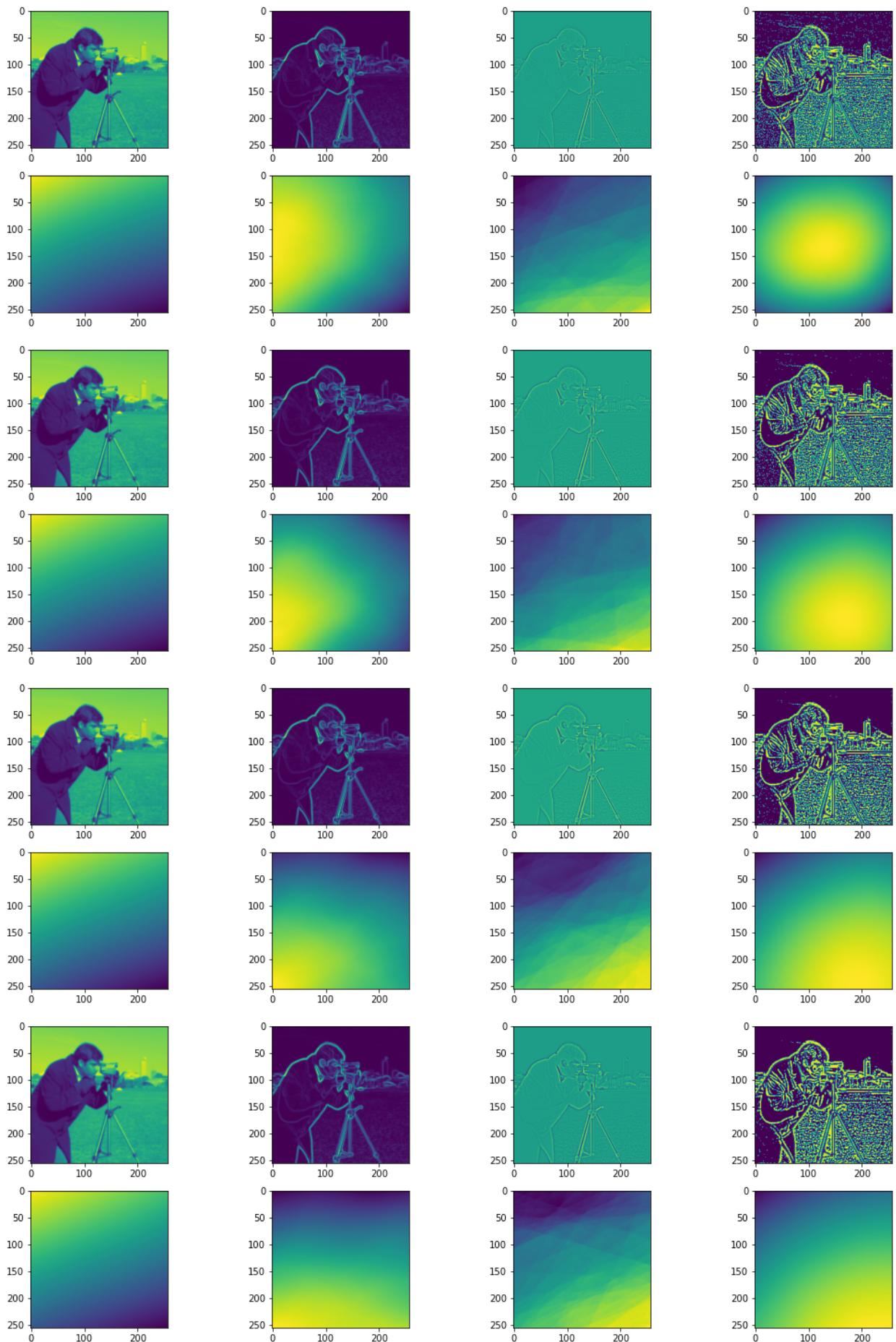


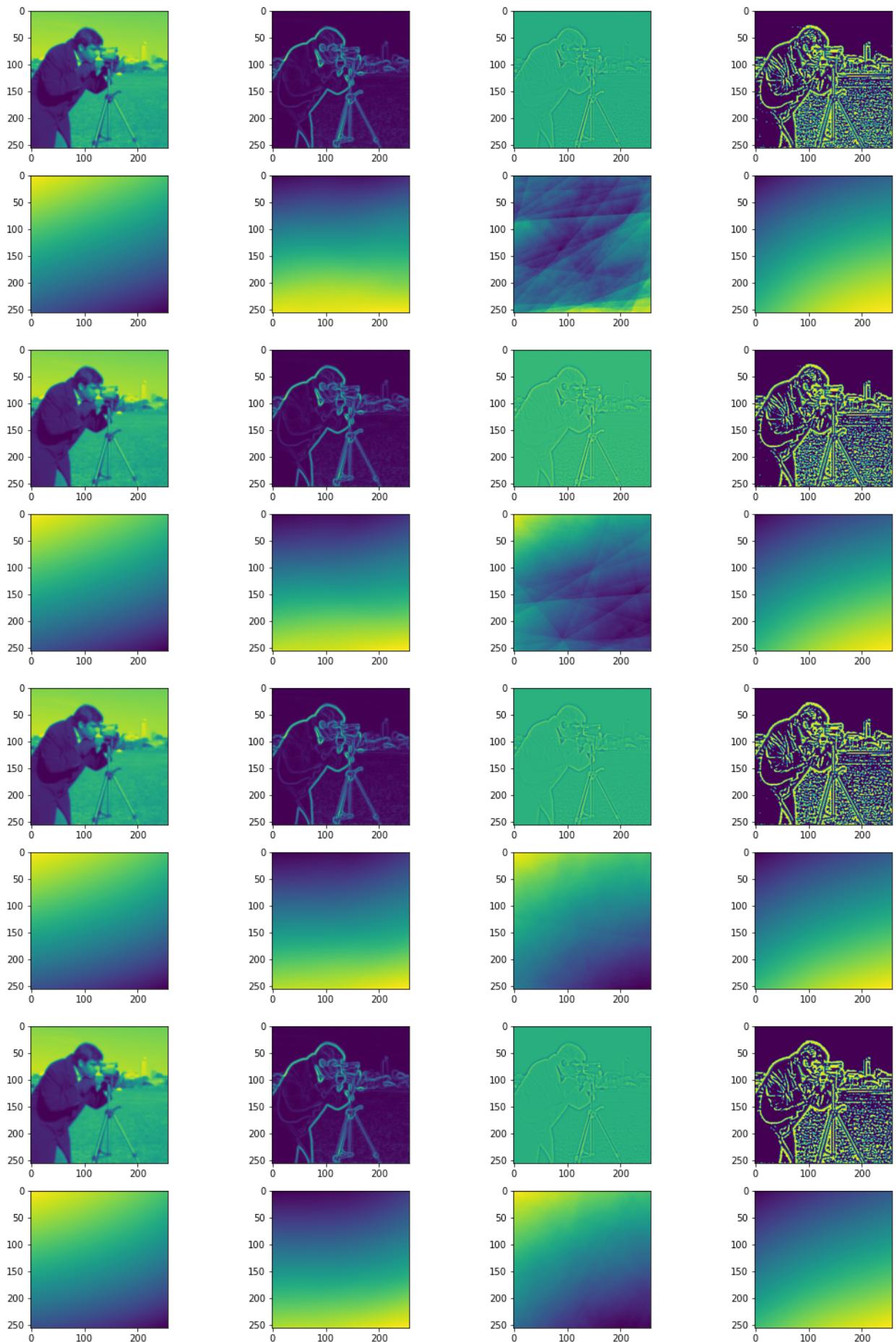


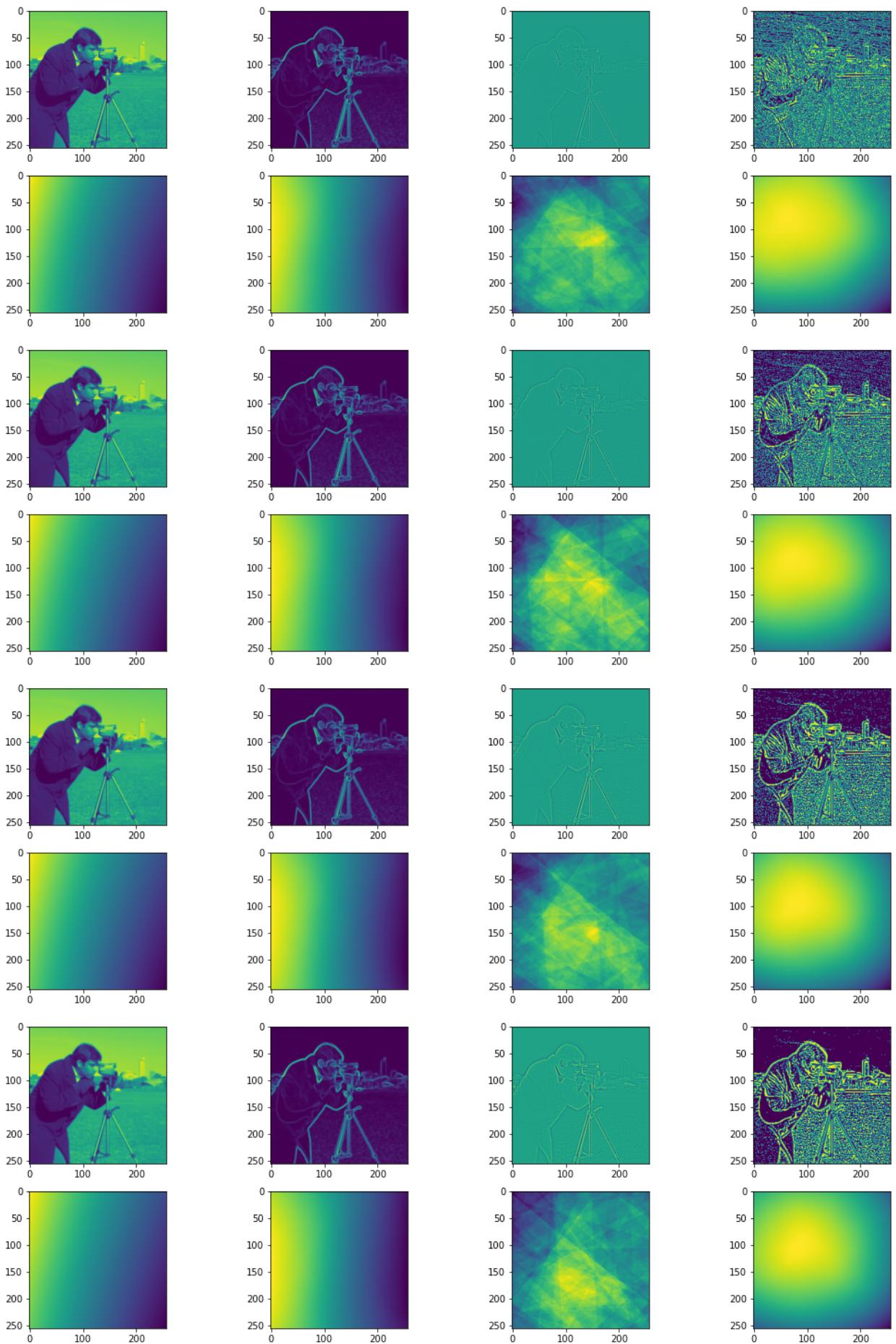


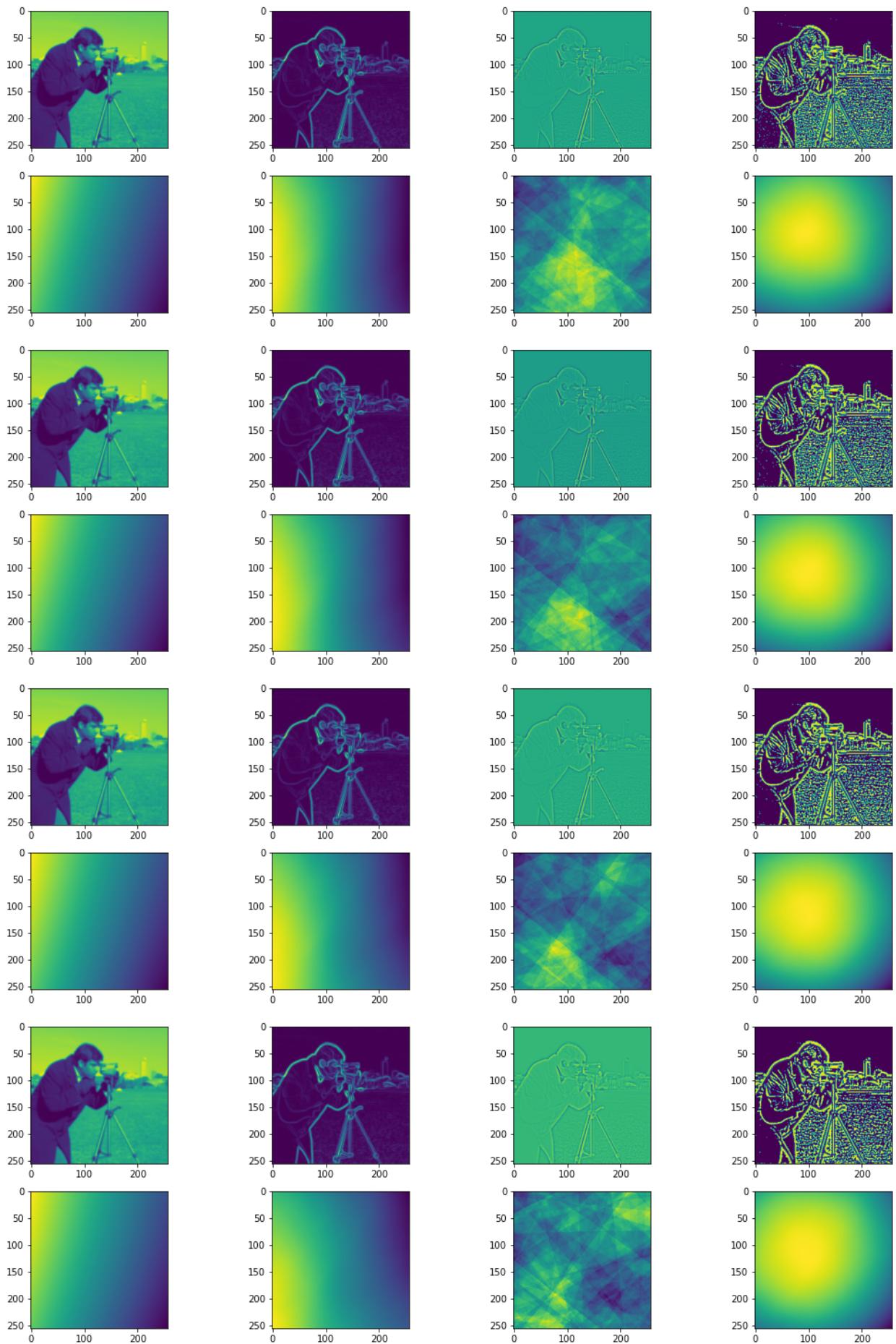


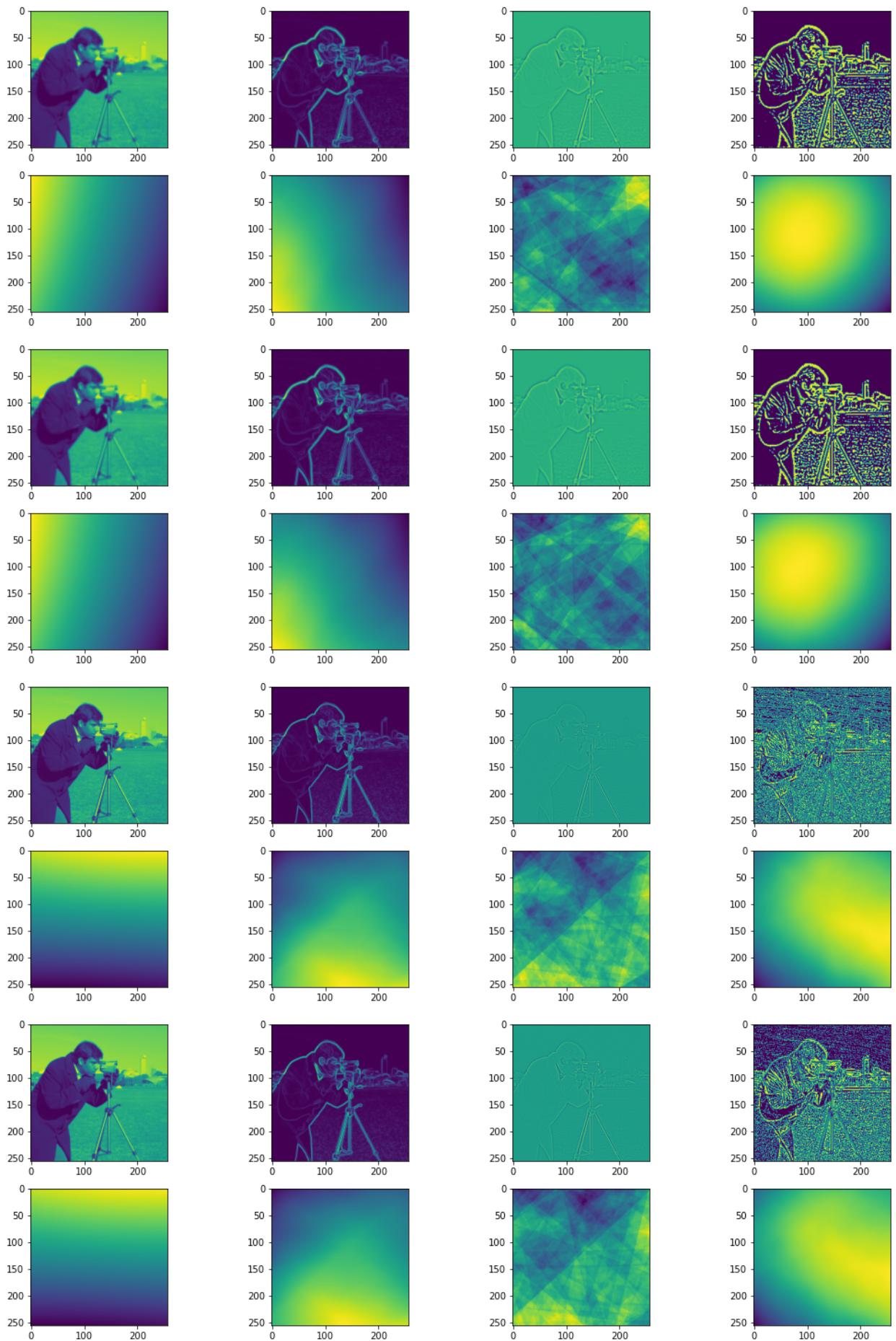


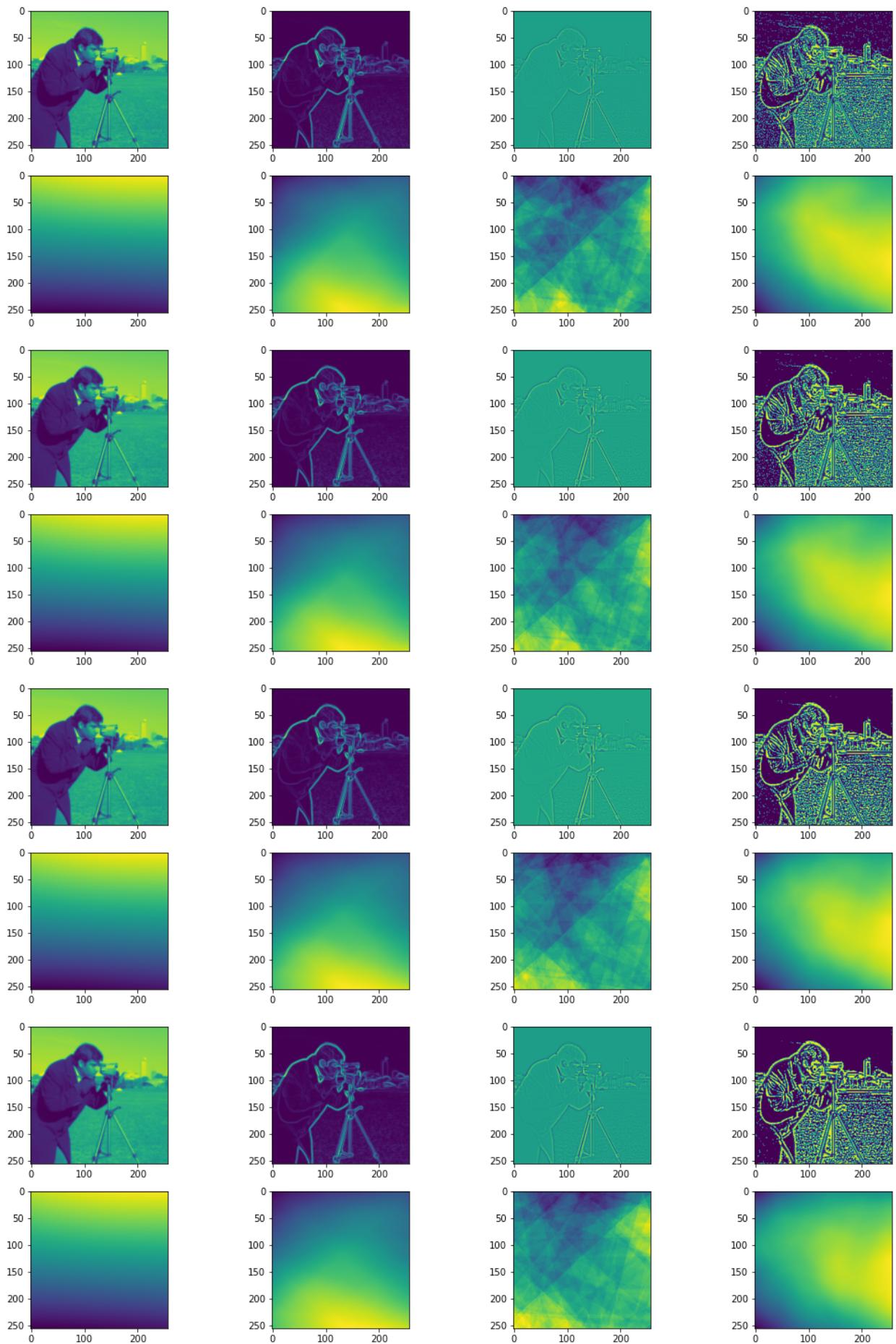


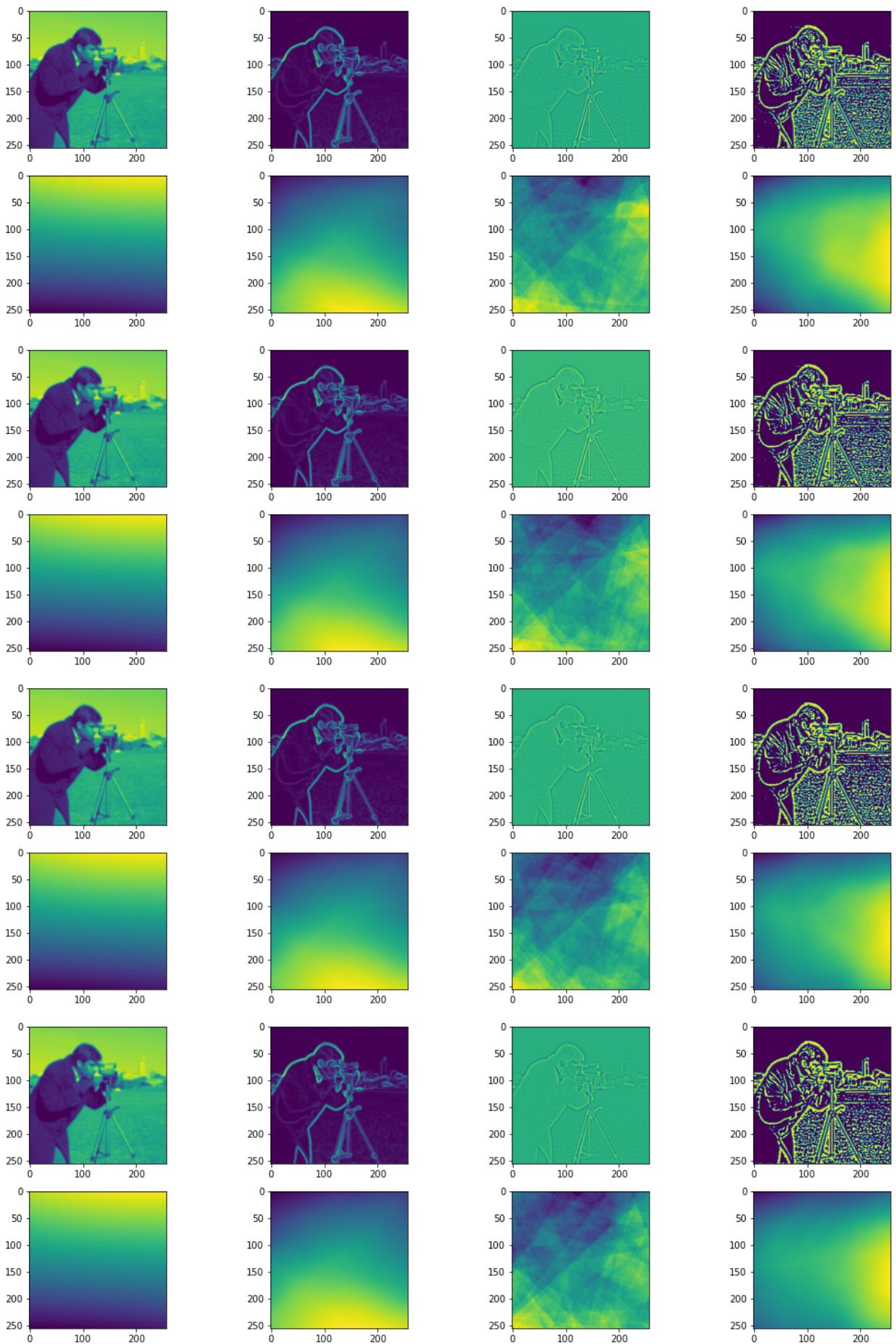


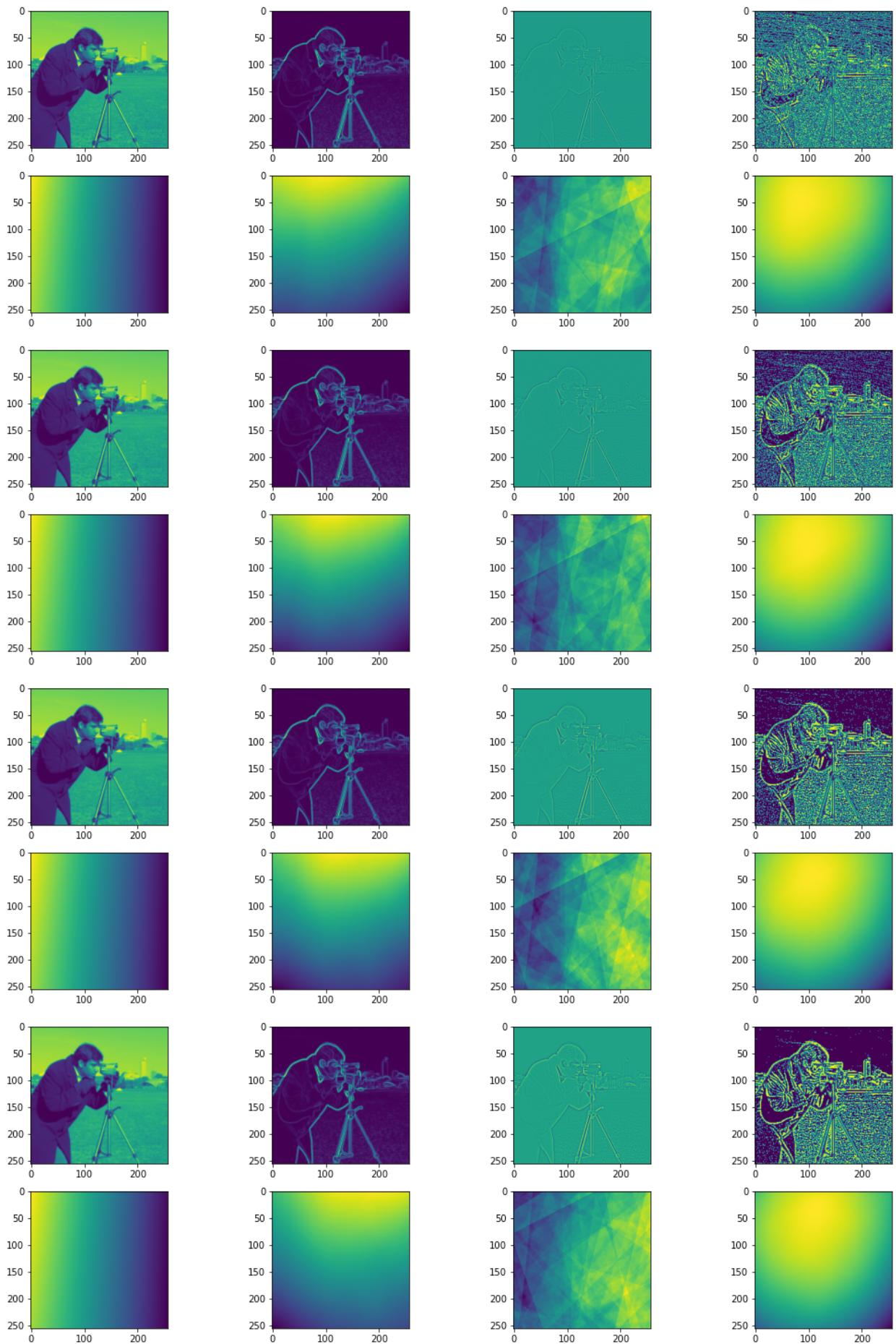


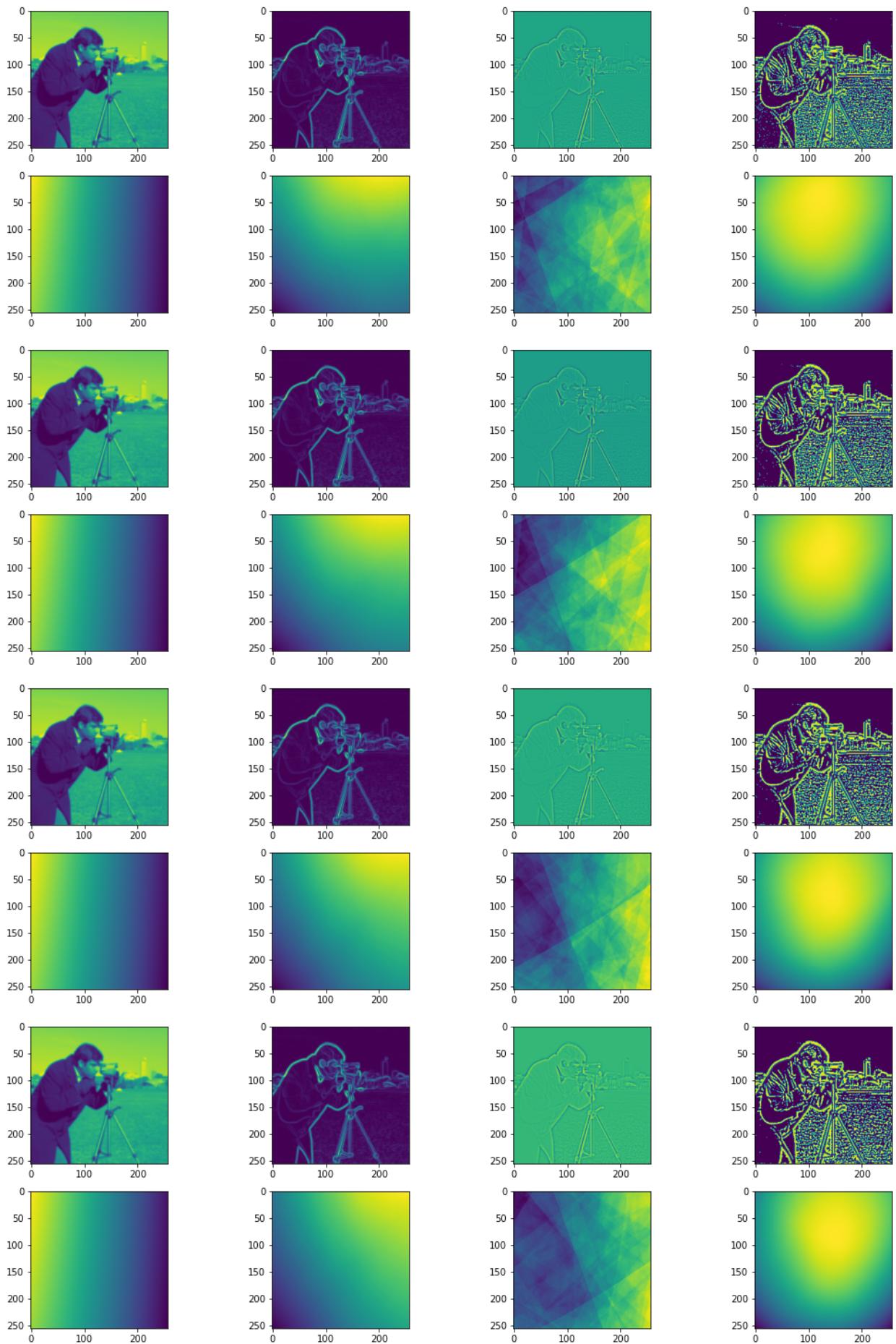


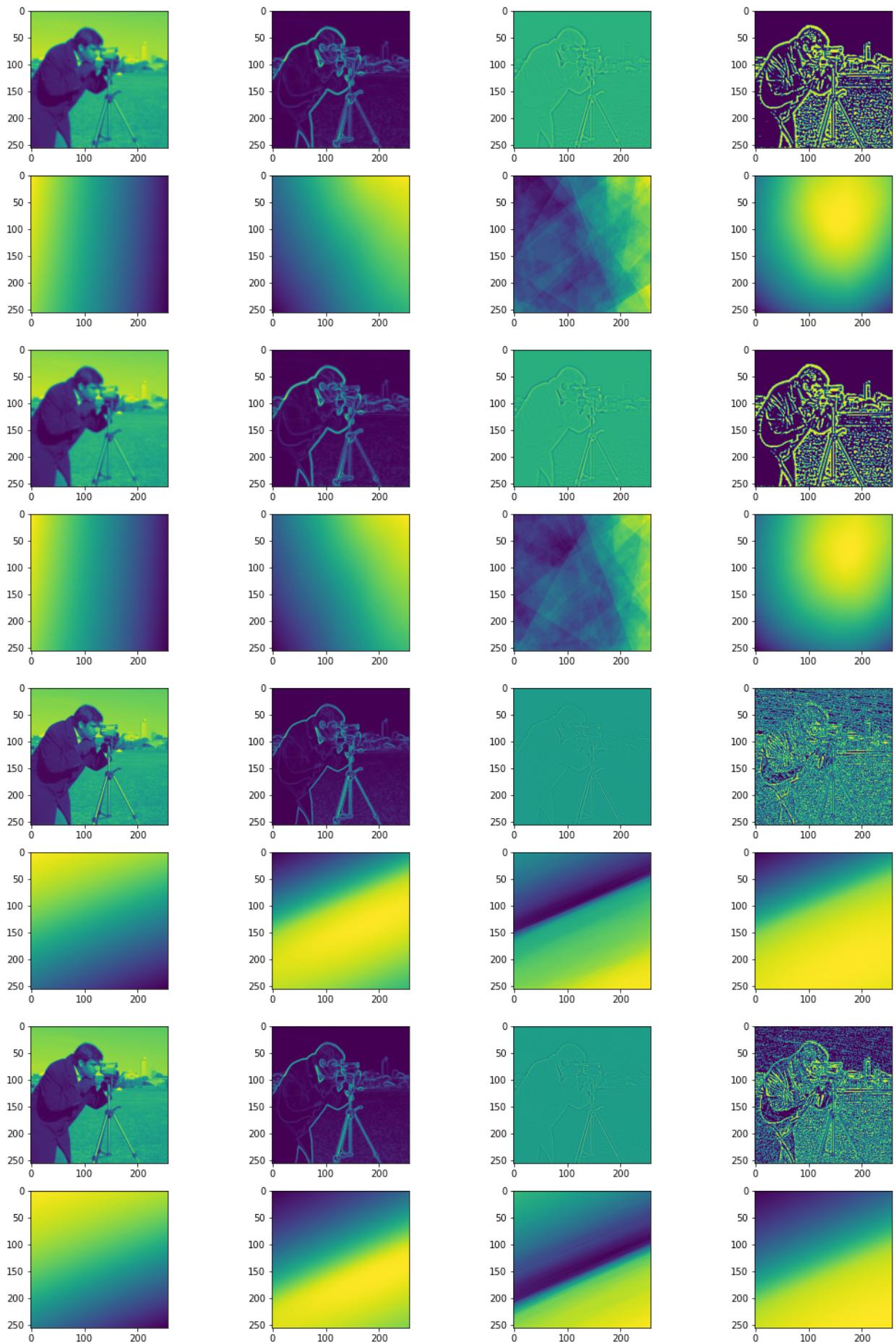


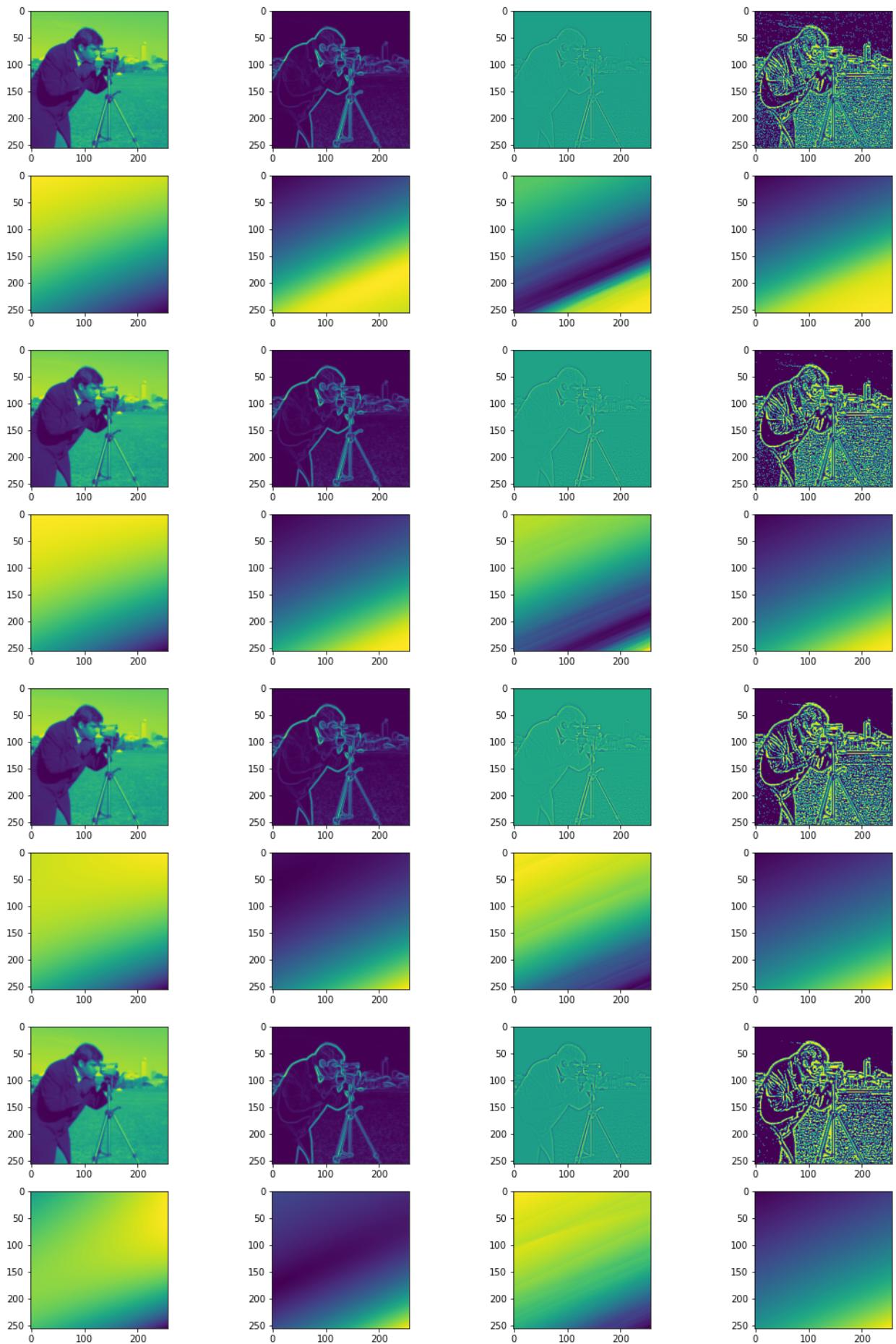


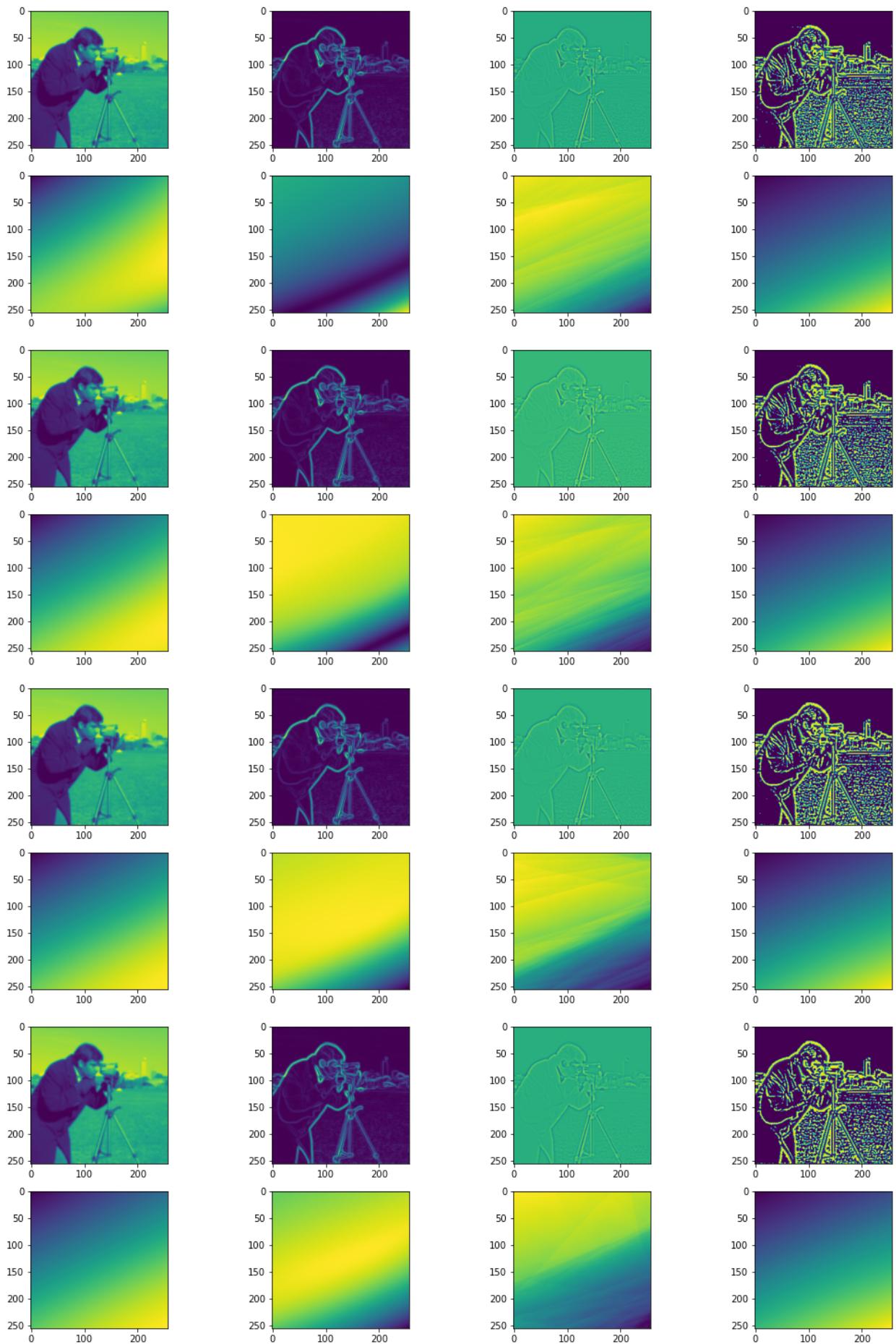


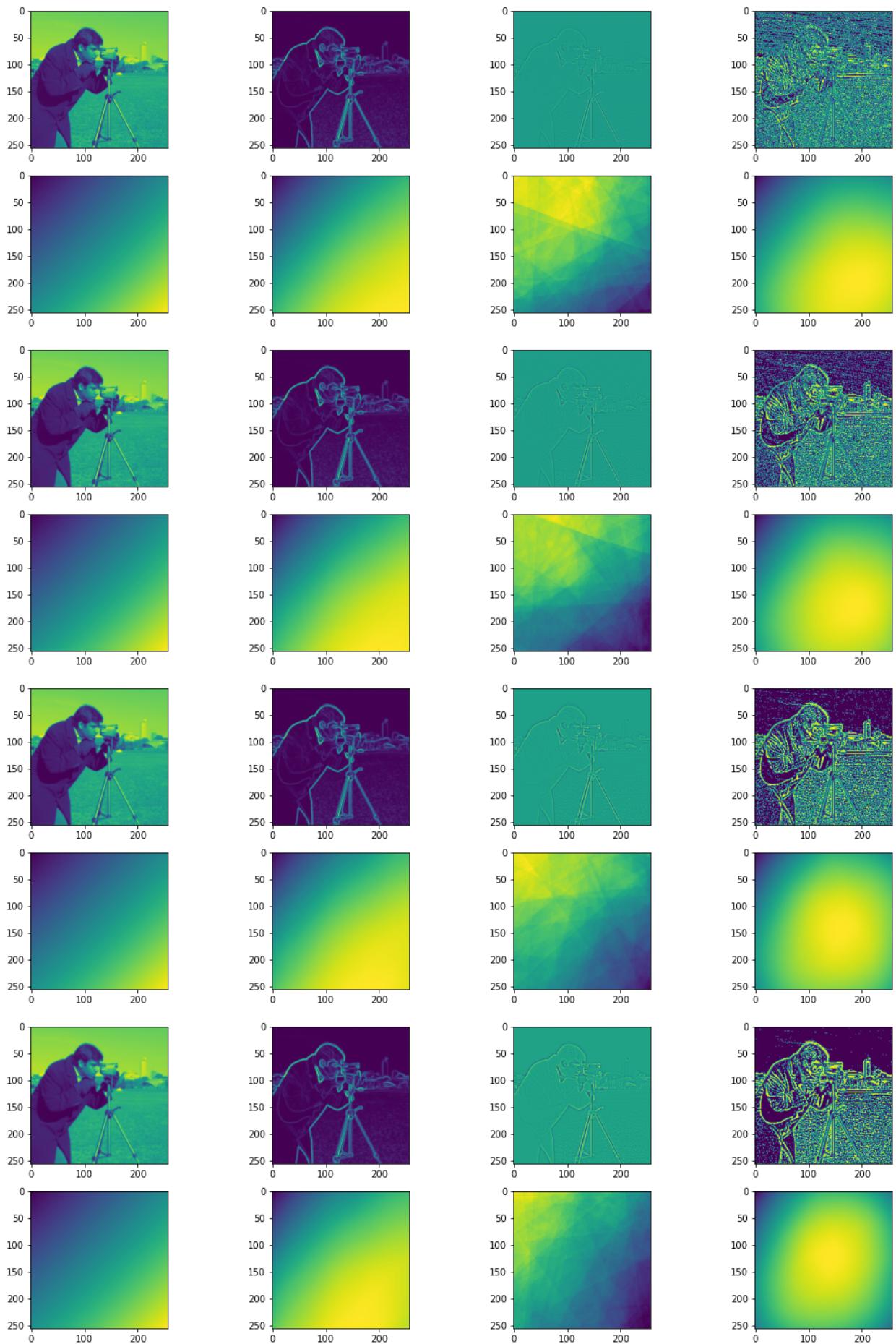


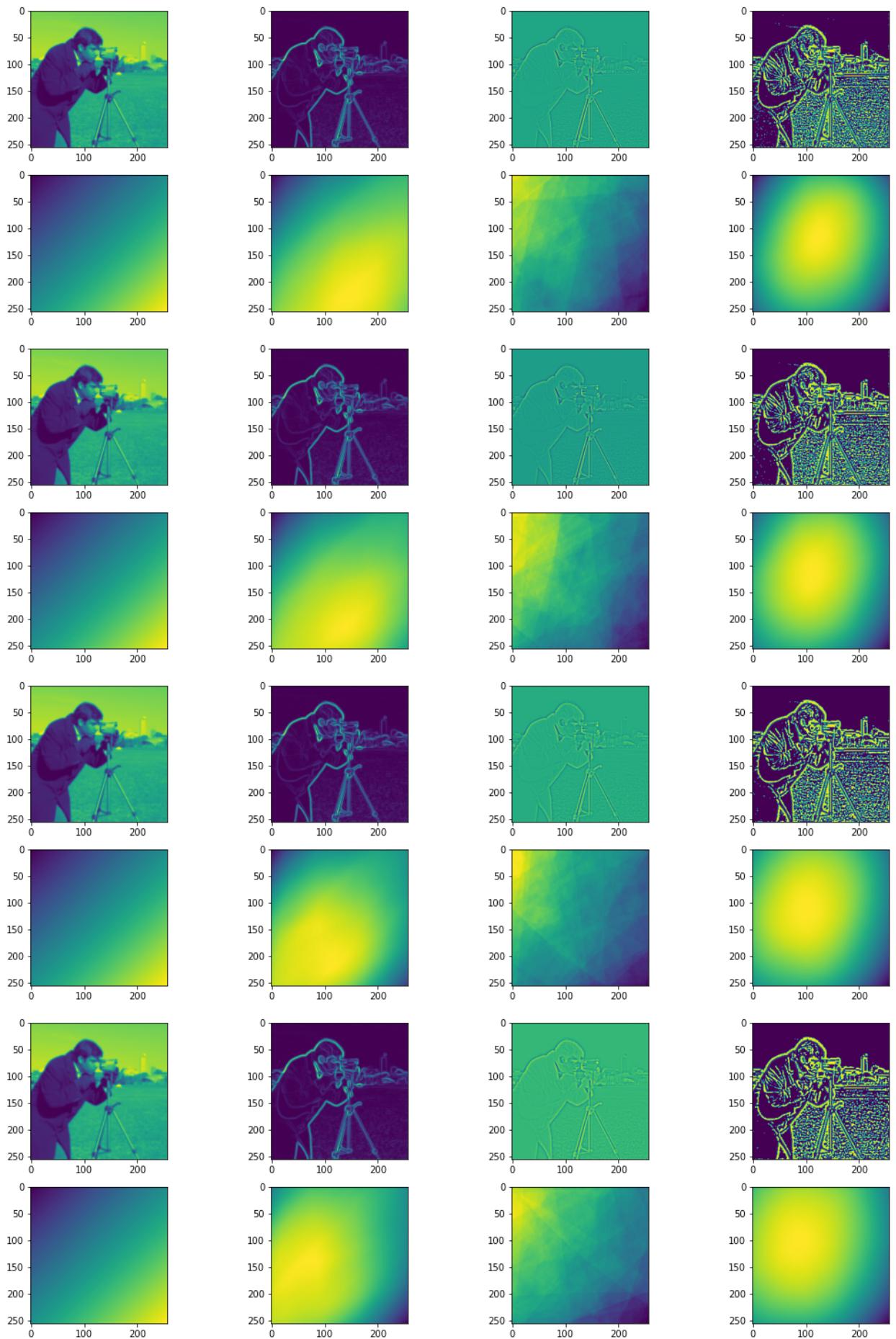


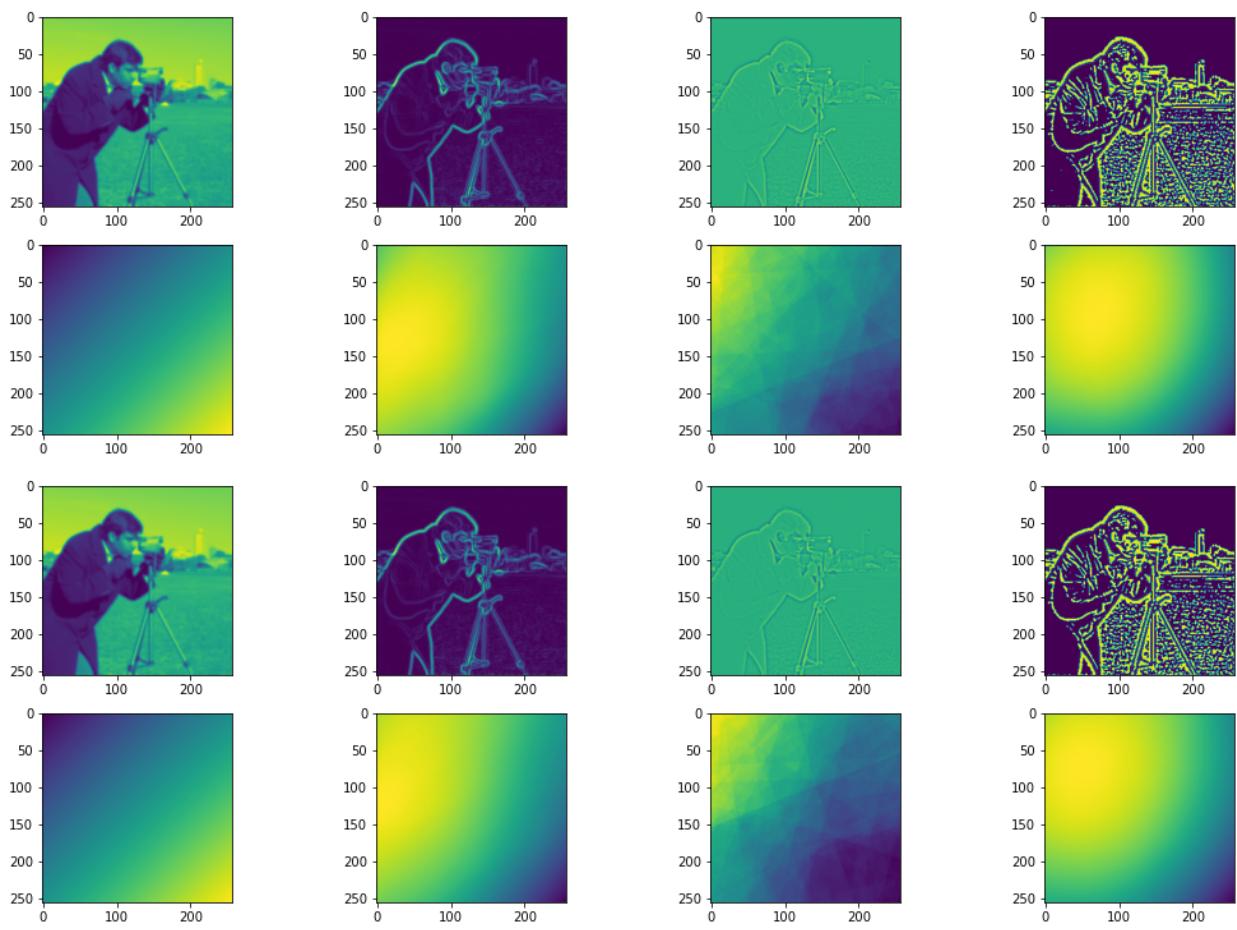












Visualize Results

```
In [38]: %load_ext tensorboard  
%tensorboard --logdir="runs"
```

The tensorboard extension is already loaded. To reload it, use:

```
%reload_ext tensorboard
```

Reusing TensorBoard on port 6006 (pid 8061), started 0:38:27 ago. (Use '!kill 8061' to kill it.)

In []:

In []:

In []: