```
!pip install "careamics[examples]"
```

```
      Uninstalling nvidia-cufft-cu12-11.2.3.61:
        Successfully uninstalled nvidia-cufft-cu12-11.2.3.61
    Attempting uninstall: nvidia-cuda-runtime-cu12
      Found existing installation: nvidia-cuda-runtime-cu12 12.5.82
      Uninstalling nvidia-cuda-runtime-cu12-12.5.82:
        Successfully uninstalled nvidia-cuda-runtime-cu12-12.5.82
    Attempting uninstall: nvidia-cuda-nvrtc-cu12
      Found existing installation: nvidia-cuda-nvrtc-cu12 12.5.82
      Uninstalling nvidia-cuda-nvrtc-cu12-12.5.82:
        Successfully uninstalled nvidia-cuda-nvrtc-cu12-12.5.82
    Attempting uninstall: nvidia-cuda-cupti-cu12
      Found existing installation: nvidia-cuda-cupti-cu12 12.5.82
      Uninstalling nvidia-cuda-cupti-cu12-12.5.82:
        Successfully uninstalled nvidia-cuda-cupti-cu12-12.5.82
    Attempting uninstall: nvidia-cublas-cu12
      Found existing installation: nvidia-cublas-cu12 12.5.3.2
      Uninstalling nvidia-cublas-cu12-12.5.3.2:
        Successfully uninstalled nvidia-cublas-cu12-12.5.3.2
    Attempting uninstall: numpy
      Found existing installation: numpy 2.0.2
      Uninstalling numpy-2.0.2:
        Successfully uninstalled numpy-2.0.2
    Attempting uninstall: tifffile
      Found existing installation: tifffile 2025.5.21
      Uninstalling tifffile-2025.5.21:
        Successfully uninstalled tifffile-2025.5.21
    Attempting uninstall: nvidia-cusparse-cu12
      Found existing installation: nvidia-cusparse-cu12 12.5.1.3
      Uninstalling nvidia-cusparse-cu12-12.5.1.3:
        Successfully uninstalled nvidia-cusparse-cu12-12.5.1.3
    Attempting uninstall: nvidia-cudnn-cu12
      Found existing installation: nvidia-cudnn-cu12 9.3.0.75
      Uninstalling nvidia-cudnn-cu12-9.3.0.75:
        Successfully uninstalled nvidia-cudnn-cu12-9.3.0.75
    Attempting uninstall: jupyter-client
      Found existing installation: jupyter-client 6.1.12
      Uninstalling jupyter-client-6.1.12:
        Successfully uninstalled jupyter-client-6.1.12
    Attempting uninstall: xarray
      Found existing installation: xarray 2025.3.1
      Uninstalling xarray-2025.3.1:
        Successfully uninstalled xarray-2025.3.1
    Attempting uninstall: typer
      Found existing installation: typer 0.15.3
      Uninstalling typer-0.15.3:
        Successfully uninstalled typer-0.15.3
    Attempting uninstall: nvidia-cusolver-cu12
      Found existing installation: nvidia-cusolver-cu12 11.6.3.83
      Uninstalling nvidia-cusolver-cu12-11.6.3.83:
        Successfully uninstalled nvidia-cusolver-cu12-11.6.3.83
    Attempting uninstall: jupyter-server
      Found existing installation: jupyter-server 1.16.0
      Uninstalling jupyter-server-1.16.0:
        Successfully uninstalled jupyter-server-1.16.0
ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the
thinc 8.3.6 requires numpy<3.0.0,>=2.0.0, but you have numpy 1.26.4 which is incompatible.
Successfully installed arrow-1.3.0 asciitree-0.3.3 async-lru-2.0.5 bioimageio-core-0.7.0 bioimageio.spec-0.5.3.5 careamics-0.0.12
```

```
!pip install numpy==1.26.4 --force-reinstall
# After running, restart the runtime.
```

```
Collecting numpy==1.26.4
  Using cached numpy-1.26.4-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (61 kB)
Using cached numpy-1.26.4-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (18.3 MB)
Installing collected packages: numpy
  Attempting uninstall: numpy
    Found existing installation: numpy 1.26.4
    Uninstalling numpy-1.26.4:
      Successfully uninstalled numpy-1.26.4
ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the sou
thinc 8.3.6 requires numpy<3.0.0,>=2.0.0, but you have numpy 1.26.4 which is incompatible.
Successfully installed numpy-1.26.4
```

```
import importlib.util

package_name = "careamics"
spec = importlib.util.find_spec(package_name)

if spec is not None:
    print(f"✅ '{package_name}' is installed.")
else:
    print(f"❌ '{package_name}' is NOT installed.")
```

```
✅ 'careamics' is installed.
```

```
#Below codes first test CAREamics with native examples and then use our SWIR images for training and predcition.
from pathlib import Path

import matplotlib.pyplot as plt
import tifffile
import numpy as np
from PIL import Image
from careamics import CAREamist
from careamics.config import create_n2v_configuration
from careamics_portfolio import PortfolioManager
```

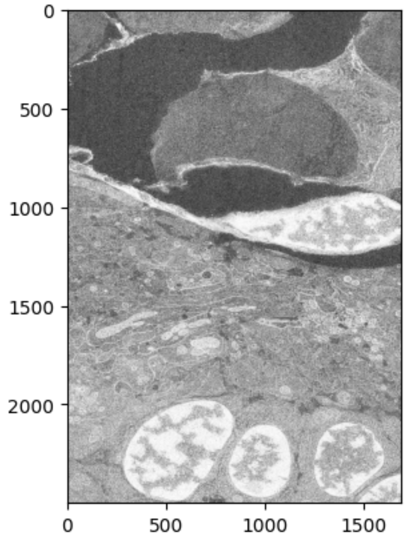
```
# instantiate data portfolio manage
portfolio = PortfolioManager()

# and download the data
root_path = Path("./data")
files = portfolio.denoising.N2V_SEM.download(root_path)
print(files)
```

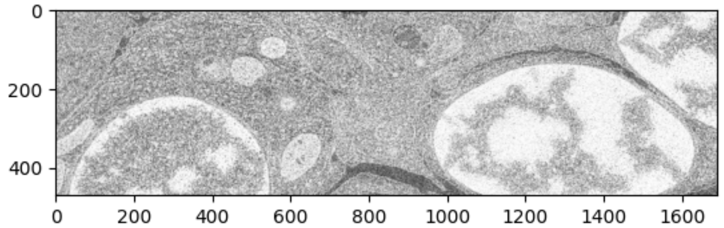
```
Downloading file 'denoising-N2V_SEM' from 'https://download.fht.org/jug/n2v/SEM.zip' to '/content/data'.
100%|█████████████████████████████████████| 13.0M/13.0M [00:00<00:00, 16.4GB/s]
Unzipping contents of '/content/data/denoising-N2V_SEM' to '/content/data/denoising-N2V_SEM.unzip'
['/content/data/denoising-N2V_SEM.unzip/SEM/validation.tif', '/content/data/denoising-N2V_SEM.unzip/SEM/train.tif']
```

```
root_path = Path("./data/images")
files = portfolio.denoising.N2V_SEM.download(root_path)
print(files)
```

```
Downloading file 'denoising-N2V_SEM' from 'https://download.fht.org/jug/n2v/SEM.zip' to '/content/data/images'.
100%|█████████████████████████████████████| 13.0M/13.0M [00:00<00:00, 19.7GB/s]
Unzipping contents of '/content/data/images/denoising-N2V_SEM' to '/content/data/images/denoising-N2V_SEM.unzip'
['/content/data/images/denoising-N2V_SEM.unzip/SEM/validation.tif', '/content/data/images/denoising-N2V_SEM.unzip/SEM/train.tif']
```

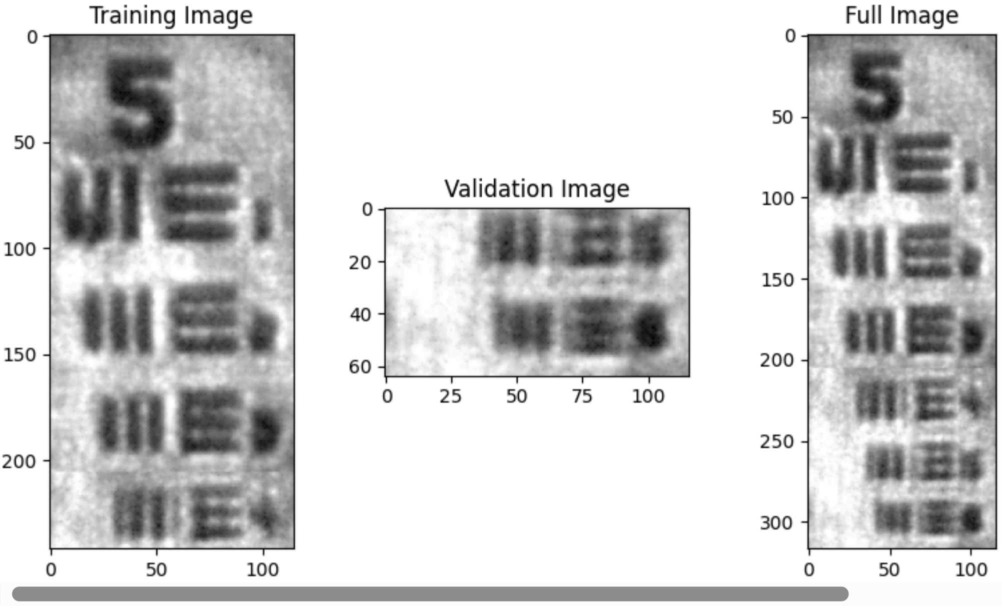
```
# portfolio.denoising.N2V_SEM.description
files[0]
plt.imshow(tifffile.imread(files[1]), cmap='gray')
plt.show()
plt.imshow(tifffile.imread(files[0]), cmap='gray')
plt.show()
```





```
# load training and validation image and show them side by side
# train_image = tifffile.imread(files[1])
# val_image = tifffile.imread(files[0])

rgb_image = tifffile.imread('/content/drive/MyDrive/ASTAR/Research/USAF n2v/group5.tif')
rgb_image1 = tifffile.imread('/content/drive/MyDrive/ASTAR/Research/USAF n2v/group5_val.tif')
rgb_image2 = tifffile.imread('/content/drive/MyDrive/ASTAR/Research/USAF n2v/group5_full.tif')


# Check if the image has three channels (RGB)
if rgb_image.ndim == 3 and rgb_image.shape[-1] == 3:
    # Convert RGB to grayscale using the luminance formula
    train_image = np.dot(rgb_image[...,:3], [0.2989, 0.5870, 0.1140])
else:
    # If not, assume it's already grayscale
    train_image = rgb_image
    print("dileep")

if rgb_image1.ndim == 3 and rgb_image1.shape[-1] == 3:
    # Convert RGB to grayscale using the luminance formula
    val_image = np.dot(rgb_image1[...,:3], [0.2989, 0.5870, 0.1140])
else:
    # If not, assume it's already grayscale
    val_image = rgb_image1
    print("dileep")

if rgb_image2.ndim == 3 and rgb_image2.shape[-1] == 3:
    # Convert RGB to grayscale using the luminance formula
    train_image1 = np.dot(rgb_image2[...,:3], [0.2989, 0.5870, 0.1140])
else:
    # If not, assume it's already grayscale
    train_image1 = rgb_image2
    print("dileep")

fig, ax = plt.subplots(1, 3, figsize=(10, 5))
ax[0].imshow(train_image, cmap="gray")
ax[0].set_title("Training Image")
ax[1].imshow(val_image, cmap="gray")
ax[1].set_title("Validation Image")
ax[2].imshow(train_image1, cmap="gray")
ax[2].set_title("Full Image")
```

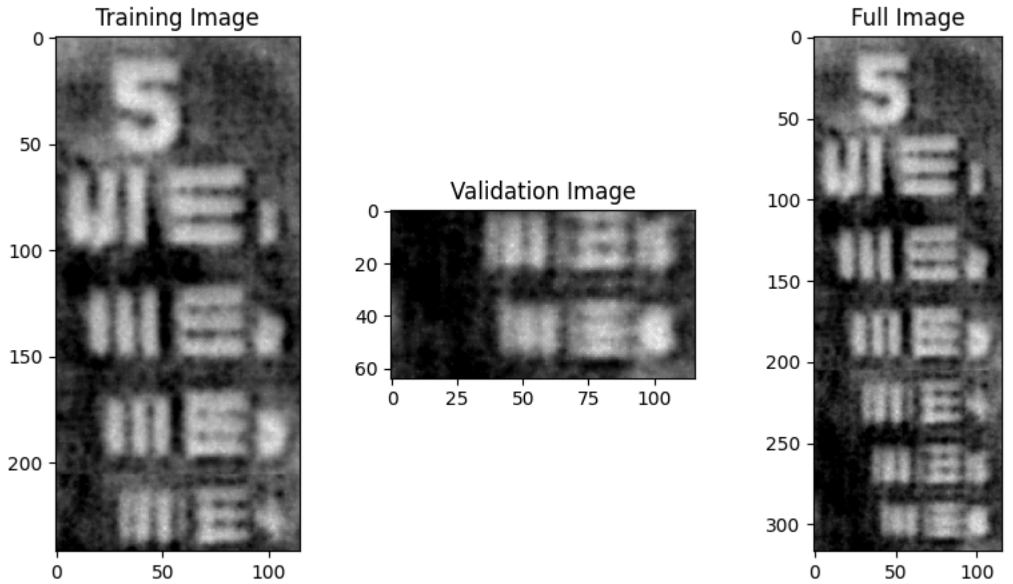
```
Text(0.5, 1.0, 'Full Image')
```



```
import tifffile
import numpy as np
import matplotlib.pyplot as plt

# Read images
rgb_image = tifffile.imread('/content/drive/MyDrive/ASTAR/Research/USAF n2v/group5.tif')
rgb_image1 = tifffile.imread('/content/drive/MyDrive/ASTAR/Research/USAF n2v/group5_val.tif')
rgb_image2 = tifffile.imread('/content/drive/MyDrive/ASTAR/Research/USAF n2v/group5_full.tif')

# Check if the image has three channels (RGB)
if rgb_image.ndim == 3 and rgb_image.shape[-1] == 3:
    # Convert RGB to grayscale using the luminance formula
    train_image = np.dot(rgb_image[...,:3], [0.2989, 0.5870, 0.1140])
```

```
else:
    # If not, assume it's already grayscale
    train_image = rgb_image
    print("dileep")

if rgb_image1.ndim == 3 and rgb_image1.shape[-1] == 3:
    # Convert RGB to grayscale using the luminance formula
    val_image = np.dot(rgb_image1[...,:3], [0.2989, 0.5870, 0.1140])
else:
    # If not, assume it's already grayscale
    val_image = rgb_image1
    print("dileep")

if rgb_image2.ndim == 3 and rgb_image2.shape[-1] == 3:
    # Convert RGB to grayscale using the luminance formula
    train_image1 = np.dot(rgb_image2[...,:3], [0.2989, 0.5870, 0.1140])
else:
    # If not, assume it's already grayscale
    train_image1 = rgb_image2
    print("dileep")

# Ensure the images are in an 8-bit format (values 0-255)
# If they are not, you might need to rescale appropriately.
train_image_uint8 = train_image.astype(np.uint8)
val_image_uint8 = val_image.astype(np.uint8)
train_image1_uint8 = train_image1.astype(np.uint8)


# Invert the images: pixel value inversion (e.g., 255 becomes 0, 0 becomes 255)
train_image = 255 - train_image_uint8
val_image   = 255 - val_image_uint8
train_image1 = 255 - train_image1_uint8

fig, ax = plt.subplots(1, 3, figsize=(10, 5))
ax[0].imshow(train_image, cmap="gray")
ax[0].set_title("Training Image")
ax[1].imshow(val_image, cmap="gray")
ax[1].set_title("Validation Image")
ax[2].imshow(train_image1, cmap="gray")
ax[2].set_title("Full Image")
```

```
Text(0.5, 1.0, 'Full Image')
```



```
# config = create_n2v_configuration(
#     experiment_name="usaf",
#     data_type="array",
#     axes="YX",
#     patch_size=(64, 64),
#     batch_size=32,
#     num_epochs=500,
#     use_n2v2=False,
# )

# from careamics.config import create_n2v_configuration

# Create your base configuration
config = create_n2v_configuration(
    experiment_name="usaf",
    data_type="array",
    axes="YX",
    patch_size=(64, 64),
    batch_size=256,
    num_epochs=60,  # Use a high number and let early stopping decide when to stop
)

# --- Modify Learning Rate Scheduler ---
# Instead of config.algorithm_config["lr_scheduler"]["parameters"] = {...}
config.algorithm_config.lr_scheduler.parameters = {
    "factor": 0.5,        # reduce LR by half
    "patience": 5,        # wait 5 epochs before reducing LR
    "min_lr": 1e-6,
    "verbose": True,
}

# --- Add weight decay to the optimizer ---
# Instead of config.algorithm_config["optimizer"]["parameters"]["weight_decay"] = 1e-5
config.algorithm_config.optimizer.parameters["weight_decay"] = 1e-5

# --- Add dropout to the UNet model (if supported) ---
# Instead of config.algorithm_config["model"]["dropout"] = 0.2
# config.algorithm_config.model.dropout = 0.2

# --- Set Early Stopping ---
# Instead of setting an early stopping dict in the training_config dict via subscripting,
# config.training_config.early_stopping = {
#     "monitor": "val_loss",
#     "mode": "min",
#     "patience": 10,
#     "verbose": True,
# }

# --- Extend Data Augmentation Transforms ---
# Here, transforms is likely a list, so extend works the same
# config.data_config.transforms.extend([
#     {"name": "RandomBrightnessContrast", "p": 0.5},
#     {"name": "GaussianNoise", "mean": 0, "std": 0.1, "p": 0.5},
# ])

# --- Make validation DataLoader not shuffle (if needed) ---
# config.data_config.val_dataloader_params["shuffle"] = False

# --- Enable verbose progress bar ---
config.training_config.enable_progress_bar = True


print(config)
```

```
{'algorithm_config': {'algorithm': 'n2v',
                      'loss': 'n2v',
                      'lr_scheduler': {'name': 'ReduceLROnPlateau',
                                       'parameters': {'factor': 0.5,
                                                      'min_lr': 1e-06,
                                                      'patience': 5,
                                                      'verbose': True}},
                      'model': {'architecture': 'UNet',
                                'conv_dims': 2,
                                'depth': 2,
                                'final_activation': 'None',
                                'in_channels': 1,
                                'independent_channels': True,
                                'n2v2': False,
                                'num_channels_init': 32,
                                'num_classes': 1},
                      'n2v_config': {'masked_pixel_percentage': 0.2,
                                     'name': 'N2VManipulate',
                                     'remove_center': True,
                                     'roi_size': 11,
                                     'strategy': 'uniform',
                                     'struct_mask_axis': 'none',
                                     'struct_mask_span': 5},
                      'optimizer': {'name': 'Adam',
                                    'parameters': {'lr': 0.0001,
                                                   'weight_decay': 1e-05}}},
 'data_config': {'axes': 'YX',
                 'batch_size': 256,
                 'data_type': 'array',
                 'patch_size': [64, 64],
                 'train_dataloader_params': {'shuffle': True},
                 'transforms': [{'flip_x': True,
                                 'flip_y': True,
                                 'name': 'XYFlip',
                                 'p': 0.5},
                                {'name': 'XYRandomRotate90', 'p': 0.5}],
                 'val_dataloader_params': {}},
 'experiment_name': 'usaf',
 'training_config': {'accumulate_grad_batches': 1,
                     'check_val_every_n_epoch': 1,
                     'checkpoint_callback': {'auto_insert_metric_name': False,
                                             'mode': 'min',
                                             'monitor': 'val_loss',
                                             'save_last': True,
                                             'save_top_k': 3,
                                             'save_weights_only': False,
                                             'verbose': False},
                     'enable_progress_bar': True,
                     'gradient_clip_algorithm': 'norm',
                     'max_steps': -1,
                     'num_epochs': 60,
                     'precision': '32'},
 'version': '0.1.0'}
```

```
# instantiate a CAREamist
careamist = CAREamist(source=config)

# train
careamist.train(
    train_source=val_image,
    val_source=train_image,
)
```

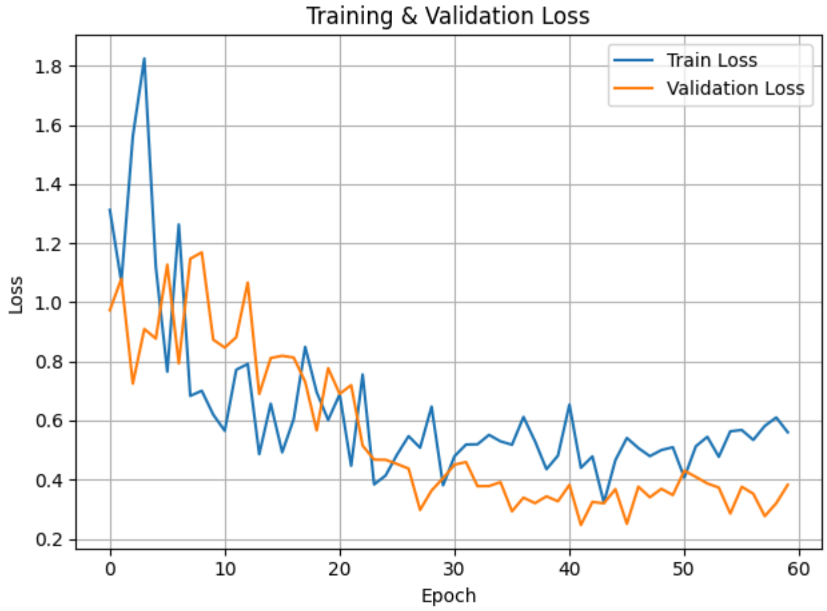
```
No working directory provided. Using current working directory: /content.
INFO:pytorch_lightning.utilities.rank_zero:GPU available: True (cuda), used: True
INFO:pytorch_lightning.utilities.rank_zero:TPU available: False, using: 0 TPU cores
INFO:pytorch_lightning.utilities.rank_zero:HPU available: False, using: 0 HPUs
/usr/local/lib/python3.11/dist-packages/pytorch_lightning/callbacks/model_checkpoint.py:654: Checkpoint directory /content/checkp
INFO:pytorch_lightning.accelerators.cuda:LOCAL_RANK: 0 - CUDA_VISIBLE_DEVICES: [0]
INFO:pytorch_lightning.callbacks.model_summary:
  | Name  | Type | Params | Mode
---------------------------------------
0 | model | UNet | 509 K  | train
---------------------------------------
509 K     Trainable params
0         Non-trainable params
509 K     Total params
2.037     Total estimated model params size (MB)
39        Modules in train mode
0         Modules in eval mode


/usr/local/lib/python3.11/dist-packages/pytorch_lightning/trainer/connectors/data_connector.py:425: The 'val_dataloader' does not
/usr/local/lib/python3.11/dist-packages/pytorch_lightning/trainer/connectors/data_connector.py:425: The 'train_dataloader' does n
/usr/local/lib/python3.11/dist-packages/pytorch_lightning/loops/fit_loop.py:310: The number of training batches (1) is smaller th
Epoch 59: 100%                      1/1 [00:00<00:00, 13.45it/s, train_loss_step=0.56, val_loss=0.383, train_loss_epoch=0.56]
```

```
INFO:pytorch_lightning.utilities.rank_zero:`Trainer.fit` stopped: `max_epochs=60` reached.
```

```
# After training
trainer = careamist.trainer  # the internal Lightning trainer

# Extract logged losses
metrics = trainer.logger.experiment.metrics

# If metrics are empty, fall back to the CSV logger
import pandas as pd
df = pd.read_csv(trainer.logger.log_dir + "/metrics.csv")
print(df)
```

```
     epoch  step  train_loss_epoch  train_loss_step  val_loss
0        0     0               NaN              NaN  0.973064
1        0     0          1.312208              NaN       NaN
2        1     1               NaN              NaN  1.079321
3        1     1          1.069123              NaN       NaN
4        2     2               NaN              NaN  0.724986
..     ...   ...               ...              ...       ...
116     57    57          0.581524              NaN       NaN
117     58    58               NaN              NaN  0.320148
118     58    58          0.610226              NaN       NaN
119     59    59               NaN              NaN  0.382589
120     59    59          0.560193              NaN       NaN

[121 rows x 5 columns]
```

```
from pathlib import Path
import pandas as pd

def read_csv_logger_v5(experiment_name: str, log_folder: str) -> dict:
    path = Path(log_folder) / experiment_name
    versions = [int(v.name.split("_")[-1]) for v in path.iterdir() if v.is_dir()]
    version = max(versions)

    csv_path = path / f"version_{version}" / "metrics.csv"
    df = pd.read_csv(csv_path)

    # Drop rows where both train and val are NaN
    df = df.dropna(subset=["train_loss_epoch", "val_loss"], how="all")

    # Extract losses
    train_epochs = df[~df["train_loss_epoch"].isna()]["epoch"].astype(int).values
    val_epochs = df[~df["val_loss"].isna()]["epoch"].astype(int).values
    train_losses = df[~df["train_loss_epoch"].isna()]["train_loss_epoch"].astype(float).values
    val_losses = df[~df["val_loss"].isna()]["val_loss"].astype(float).values

    return {
        "train_epoch": train_epochs,
        "val_epoch": val_epochs,
        "train_loss": train_losses,
        "val_loss": val_losses,
    }

loss_curves = read_csv_logger_v5("usaf", "/content/csv_logs")

import matplotlib.pyplot as plt

plt.plot(loss_curves["train_epoch"], loss_curves["train_loss"], label="Train Loss")
plt.plot(loss_curves["val_epoch"], loss_curves["val_loss"], label="Validation Loss")
plt.xlabel("Epoch")
plt.ylabel("Loss")
plt.title("Training & Validation Loss")
plt.legend()
plt.grid(True)
plt.tight_layout()
plt.show()
```



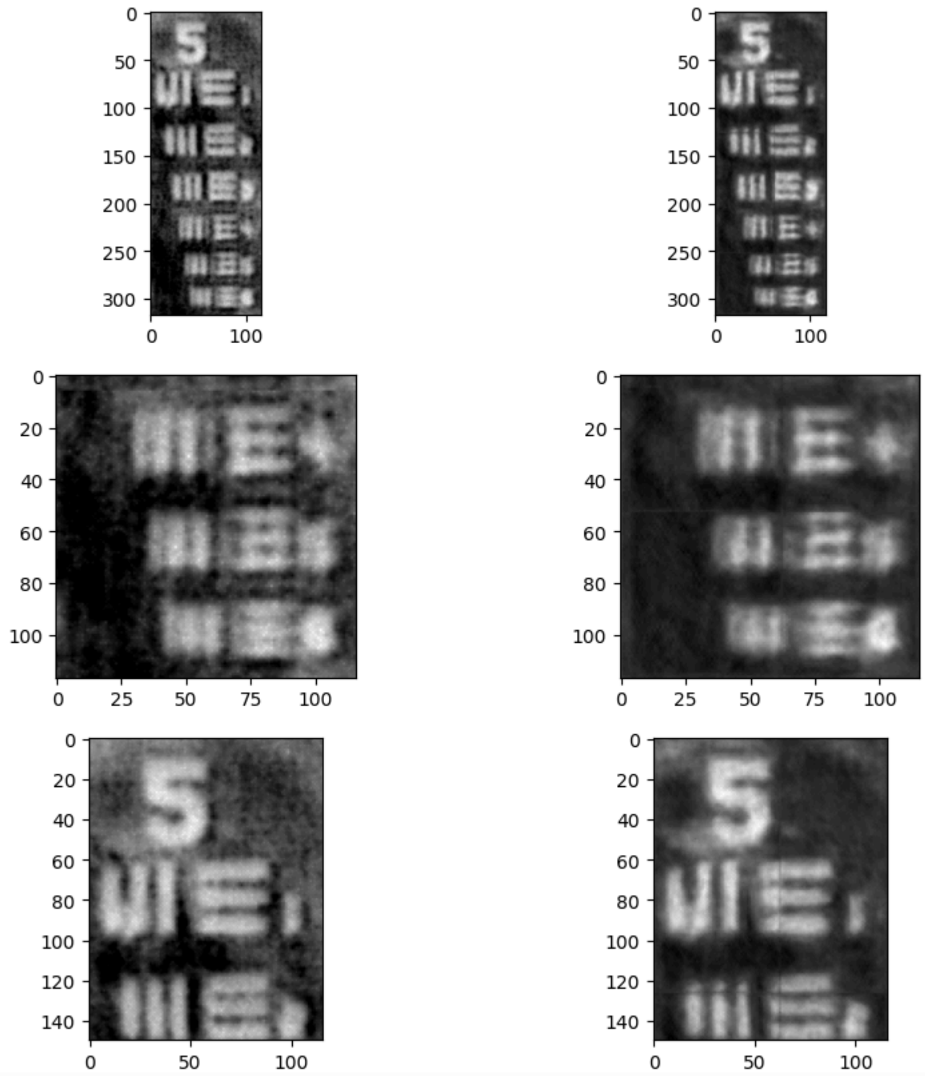
```
# import math
print(train_image.ndim)
print(train_image.shape)
print(val_image.ndim)
print(val_image.shape)
# # Get image dimensions
# image_height, image_width = train_image.shape

# # Calculate tile size to ensure even division
# tile_size = (
#     math.gcd(image_height, 128),  # Find greatest common divisor with 128
#     math.gcd(image_width, 128)   # Find greatest common divisor with 128
# )


# That means:

# Your width is only 116 pixels, which is smaller than the tile width (256).

# So, when Careamics tries to split the image into tiles of 256×256, it hits the border, and one tile ends up with zero width (0) — henc

prediction = careamist.predict(source=train_image1, tile_size=(128,64),tile_overlap=(2,2))
print(prediction[0])
# prediction = careamist.predict(source=train_image, tile_size=(100,100))
# print(prediction)
```

```
INFO:pytorch_lightning.accelerators.cuda:LOCAL_RANK: 0 - CUDA_VISIBLE_DEVICES: [0]
2
(242, 115)
2
(64, 116)
/usr/local/lib/python3.11/dist-packages/pytorch_lightning/trainer/connectors/data_connector.py:425: The 'predict_dataloader' does nc
Predicting DataLoader 0: 100%                                                              6/6 [00:00<00:00, 267.39it/s]
[[[[161.875    161.32243 161.48132 ... 153.0663   152.57576 153.81046]
   [168.82367 169.1751  168.63647 ... 152.79886 149.99028 151.11234]
   [167.61472 169.07932 164.19455 ... 152.70943 150.4792  152.13771]
   ...
   [152.6365  141.88124 141.62785 ... 150.14095 148.94324 151.08981]
   [154.85588 142.1448  142.23076 ... 149.66837 151.21156 148.31447]
   [153.50436 147.81172 146.86647 ... 150.56392 150.8159  149.33997]]]]
```

```
# Show the full image and crops
x_start, x_end = 00, 150
y_start, y_end = 200, 350

x_start1, x_end1 = 00, 150
y_start1, y_end1 = 0, 150

# train_image =

fig, ax = plt.subplots(3, 2, figsize=(10, 10))
ax[0, 0].imshow(train_image1, cmap="gray")
ax[0, 1].imshow(prediction[0].squeeze(), cmap="gray")
ax[1, 0].imshow(train_image1[y_start:y_end, x_start:x_end], cmap="gray")
```

```
ax[1, 1].imshow(prediction[0].squeeze()[y_start:y_end, x_start:x_end], cmap="gray")
ax[2, 0].imshow(train_image1[y_start1:y_end1, x_start1:x_end1], cmap="gray")
ax[2, 1].imshow(prediction[0].squeeze()[y_start1:y_end1, x_start1:x_end1], cmap="gray")
```

```
<matplotlib.image.AxesImage at 0x7f419013b490>
```



```
# Choose a valid 2D crop from within the actual image shape
input_array = train_image[0:128, 0:128]  # assuming train_image is (317, 116)

# Or center crop safely (as small as needed)
from skimage.util import crop

h, w = train_image.shape
crop_size = 64
input_array = train_image[h//2 - crop_size//2:h//2 + crop_size//2,
                          w//2 - crop_size//2:w//2 + crop_size//2]
```

```
general_description = (
    "This model is a UNet trained using the Noise2Void algorithm to denoise "
    "images. The training data consists of crops from an SEM dataset "
    "(T.-O. Buchholz et al., Methods Cell Biol, 2020). The notebook used to "
    "train this model is available on the CAREamics documentation website; "
    "find it at the following link: "
    "https://careamics.github.io/0.1/applications/Noise2Void/SEM/."
)
input_array = input_array.astype("float32")

careamist.export_to_bmz(
    path_to_archive="usaf_epoch60.zip",
    friendly_model_name="usaf_epoch60",
    input_array=input_array,
    authors=[{"name": "CAREamics authors", "affiliation": "Human Technopole"}],
    general_description=general_description,
    data_description=portfolio.denoising.N2V_SEM.description
)
```

```
INFO:pytorch_lightning.accelerators.cuda:LOCAL_RANK: 0 - CUDA_VISIBLE_DEVICES: [0]
Predicting DataLoader 0: 100%                                                   1/1 [00:00<00:00, 143.90it/s]
computing SHA256 of inputs.npy (result: e4bf4e76892e5fdf5371cc11500eaf25fb3ab3edeb16e2f37c864c447e3a427d): 100%|██████████| 16512/1
computing SHA256 of outputs.npy (result: 2c98364acb861a16ddd668ea14101c90bcb30ca0a5ee0ad6291256ae63376ea0): 100%|██████████| 16512/
computing SHA256 of environment.yml (result: e3bd86be247e1643656b5bae93733a47296d4de8cf7f4fda363317de6eeebf4d): 100%|██████████| 14
computing SHA256 of weights.pth (result: 6b944a287203b702fae5a2c929978f10fcda6ec5a7799925dcfbd5bbd32a3a49): 100%|██████████| 206675
computing SHA256 of careamics.yaml (result: 01ed102dc3a396ef5b0d4c39872d4a74b20a8bb3d8cb1d78c1cffc09b4193770): 100%|██████████| 144
2025-04-12 03:49:46.669 | Level 30 | bioimageio.spec.model.v0_5:_validate_documentation:2106 - documentation: No '# Validation' (su
2025-04-12 03:49:46.672 | DEBUG    | bioimageio.core._resource_tests:enable_determinism:93 - module 'tensorflow._api.v2.random' has
2025-04-12 03:49:46.673 | INFO     | bioimageio.core._resource_tests:_test_model_inference:226 - starting 'Reproduce test outputs f
2025-04-12 03:49:47.215 | INFO     | bioimageio.core._resource_tests:_test_model_inference_parametrized:317 - Testing inference wit
computing SHA256 of careamics.yaml (result: 01ed102dc3a396ef5b0d4c39872d4a74b20a8bb3d8cb1d78c1cffc09b4193770):   0%|          | 0/1
computing SHA256 of inputs.npy (result: e4bf4e76892e5fdf5371cc11500eaf25fb3ab3edeb16e2f37c864c447e3a427d):   0%|          | 0/16512
computing SHA256 of outputs.npy (result: 2c98364acb861a16ddd668ea14101c90bcb30ca0a5ee0ad6291256ae63376ea0):   0%|          | 0/1651
computing SHA256 of environment.yml (result: e3bd86be247e1643656b5bae93733a47296d4de8cf7f4fda363317de6eeebf4d):   0%|          | 0/
```

```python
from careamics.model_io.model_io_utils import load_pretrained

# Load the model and unpack the tuple
# print(config)
loaded_model, config = load_pretrained("/content/drive/MyDrive/ASTAR/Research/USAF n2v/usaf_epoch60_inverse_color.zip"
careamist = CAREamist(source=config)
careamist.model = loaded_model
careamist.model.eval()

# Read images
rgb_image = tifffile.imread('/content/drive/MyDrive/ASTAR/Research/USAF n2v/group5.tif')
rgb_image1 = tifffile.imread('/content/drive/MyDrive/ASTAR/Research/USAF n2v/group5_val.tif')
rgb_image22 = tifffile.imread('/content/drive/MyDrive/ASTAR/Research/USAF n2v/group5_full.tif')
rgb_image3 = tifffile.imread('/content/drive/MyDrive/ASTAR/Research/USAF n2v/big image.tif')


# Check if the image has three channels (RGB)

# Check if the image has three channels (RGB)
if rgb_image.ndim == 3 and rgb_image.shape[-1] == 3:
    # Convert RGB to grayscale using the luminance formula
    train_image = np.dot(rgb_image[...,:3], [0.2989, 0.5870, 0.1140])
else:
    # If not, assume it's already grayscale
    train_image = rgb_image
    print("dileep")

if rgb_image1.ndim == 3 and rgb_image1.shape[-1] == 3:
    # Convert RGB to grayscale using the luminance formula
    val_image = np.dot(rgb_image1[...,:3], [0.2989, 0.5870, 0.1140])
else:
    # If not, assume it's already grayscale
    val_image = rgb_image1
    print("dileep")

if rgb_image22.ndim == 3 and rgb_image22.shape[-1] == 3:
    # Convert RGB to grayscale using the luminance formula
    train_image11 = np.dot(rgb_image22[...,:3], [0.2989, 0.5870, 0.1140])
else:
    # If not, assume it's already grayscale
    train_image22 = rgb_image22
    print("dileep")



if rgb_image3.ndim == 3 and rgb_image3.shape[-1] == 3:
    # Convert RGB to grayscale using the luminance formula
    train_image3 = np.dot(rgb_image3[...,:3], [0.2989, 0.5870, 0.1140])
else:
    # If not, assume it's already grayscale
    train_image3 = rgb_image3
    print("dileep")

# Create a CAREamist instance using the configuration
# careamist = CAREamist(source=config)
# Now use the model for inference

#inverse bits
train_image11_uint8 = train_image11.astype(np.uint8)

train_image3_uint8 = train_image3.astype(np.uint8)


# Invert the images: pixel value inversion (e.g., 255 becomes 0, 0 becomes 255)

train_image11 = 255 - train_image11_uint8
```