Computer Vision and Audio: Challenge

Handout: 10.03.2025 08:00
Due: 18.03.2025 23:59

Spring 2025
Hands-On Deep Learning

</> Challenge Open in IDE

Audio Denoising Autoencoder

In the notebook, you explored how to use a U-Net to denoise audio samples.

Now, your challenge is to refine the denoiser to produce more natural-sounding audio.

Experiment with different architectures, loss functions, and training strategies to achieve the best results.

Hint: Prioritize training speed for faster iterations.

See your position on the leaderboard (VPN needed).

Scoring System

Points are awarded based on the model's final score, according to the thresholds below:

Model score (running)	CodeExpert score (submitting)	Points Earned
< 1.0	< 8.3%	0
≥ 1.0	≥ 8.3%	1
≥ 1.08	≥ 25.0%	2
≥ 1.11	≥ 41.7%	3
≥ 1.14	≥ 58.3%	4
≥ 1.18	≥ 75.0%	5
≥ 1.22	≥ 91.7%	6

The model score is your models perceptual quality on the test set, see logs after running a job. The CodeExpert score is the percentage displayed in CodeExpert when submitting the job.

Task

Your goal is to complete the `init_model` and `train_model` functions. Your functions are imported and called in for evaluation. **Function signature must remain unchanged.** Your code will be called by the following function:

```
def run():
  set_seed(42)

  # Get datasets for training and testing
  train_dataset, test_dataset = get_data()

  # Initialize the model using student's init_model function
  model = init_model()

  # Train the model using student's train_model function
  model = train_model(model, train_dataset)

  # Evaluate the model on the test set
  model.eval()  # Set the model to evaluation mode
  score = evaluate_model(model, test_dataset)

  return score
```

The training and testing datasets are provided to you. The model is set to evaluation mode for evaluation. You need to move models and data between RAM and the GPU.

Rules

You are not allowed to use samples in the test dataset for training, or to use a model pre-trained on the test dataset.

You cannot set a new seed.

Your code must run in 15 minutes.

Tutorial

Tutorial on how to use CodeExpert.

Toblerone

The top three solutions (leaderboard) will receive a Toblerone. Good luck! 🚀