coopertunes

0.2.0

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Chapter 1

Namespace Index

1.1 Namespace List

Here is a list of all namespaces with brief descriptions:

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 3

Class Index

3.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 4

File Index

4.1 File List

Here is a list of all files with brief descriptions:

Chapter 5

Namespace Documentation

5.1 coopertunes Namespace Reference

Namespaces

- datasets
- datatools
- distributed
- hparams
- logger
- models
- supervisors
- utils

5.2 coopertunes.datasets Namespace Reference

Namespaces

- AudioDataset
- GANSynthDataset
- MelDataset
- MidiDataset

5.3 coopertunes.datasets.AudioDataset Namespace Reference

Classes

- class AudioDataset

Functions

- def files_to_list (filename)

5.3.1 Function Documentation

5.3.1.1 files_to_list()

```
def coopertunes.datasets.AudioDataset.files_to_list (
              filename )
```

Takes a text file of filenames and makes a list of filenames

5.4 coopertunes.datasets.GANSynthDataset Namespace Reference

Classes

- class GANSynthDataset

5.5 coopertunes.datasets.MelDataset Namespace Reference

Classes

- class MelDataset

5.6 coopertunes.datasets.MidiDataset Namespace Reference

Classes

- class MidiDataset

5.7 coopertunes.datatools Namespace Reference

Namespaces

- config
- downloaders
- miditools
- process

5.8 coopertunes.datatools.config Namespace Reference

Classes

- class DataType

Variables

- dictionary DATA_NAMES

5.8.1 Variable Documentation

5.8.1.1 DATA_NAMES

```
dictionary DATA_NAMES
```

Initial value:

```
1 =  {
2     DataType.MIDI: ["classic_piano"],
3     DataType.AUDIO: [],
4 }
```

5.9 coopertunes.datatools.downloaders Namespace Reference

Functions

- def download_classic_piano (output_dir)
- def download_dataset (output_dir, data_type, name)
- def download_file (url, output_dir)
- def get_datatype_dataset_downloaders (DataType data_type)

5.9.1 Function Documentation

5.9.1.1 download_classic_piano()

```
def coopertunes.datatools.downloaders.download_classic_piano (
              output_dir )
```

5.9.1.2 download_dataset()

```
def coopertunes.datatools.downloaders.download_dataset (
              output_dir,
              data_type,
              name )
```

```
Downloads a dataset of specified data_type and name under given output_directory.
```

5.9.1.3 download_file()

```
def coopertunes.datatools.downloaders.download_file (
                url,
                output_dir )
```

5.9.1.4 get_datatype_dataset_downloaders()

```
def coopertunes.datatools.downloaders.get_datatype_dataset_downloaders (
              DataType data_type )
```

```
Returns dictionary of all posible downloaders for given datatype.
Ids in this dictionary are DATA_NAMES.
```

5.10 coopertunes.datatools.miditools Namespace Reference

Classes

- class Control
- class ControlSeq
- class Event
- class EventSeq
- class NoteSeq

Variables

- int BEAT_LENGTH = 60 / DEFAULT_TEMPO
- c
- cs = ControlSeq.from_event_seq(es)
- DEFAULT_LOADING_PROGRAMS = range(128)
- int DEFAULT_NORMALIZATION_BASELINE = 60
- int DEFAULT_NOTE_DENSITY_BINS = np.arange(12) ∗ 3 + 1
- int DEFAULT_NOTE_LENGTH = BEAT_LENGTH ∗ 2
- DEFAULT_PITCH_RANGE = range(21, 109)
- int DEFAULT_RESOLUTION = 220
- int DEFAULT_SAVING_PROGRAM = 1
- int DEFAULT_TEMPO = 120
- float DEFAULT_TIME_SHIFT_BINS = 1.15 ∗∗ np.arange(32) / 65
- int DEFAULT_VELOCITY = 64
- DEFAULT_VELOCITY_RANGE = range(21, 109)
- int DEFAULT_VELOCITY_STEPS = 32
- int DEFAULT_WINDOW_SIZE = BEAT_LENGTH ∗ 4
- es = EventSeq.from_note_seq(NoteSeq.from_midi_file(path))
- int MIN_NOTE_LENGTH = BEAT_LENGTH / 2
- int path
- bool USE_VELOCITY = True

5.10.1 Detailed Description

File from https://github.com/djosix/Performance-RNN-PyTorch on MIT licence.

5.10.2 Variable Documentation

5.10.2.1 BEAT_LENGTH

```
int BEAT_LENGTH = 60 / DEFAULT_TEMPO
```

5.10.2.2 c

```
c
```

Initial value:

```
1 =  ControlSeq.recover_compressed_array(
2         pickle.load(open('/tmp/cs-compressed.data', 'rb')))
```

5.10.2.3 cs

```
cs = ControlSeq.from_event_seq(es)
```

5.10.2.4 DEFAULT_LOADING_PROGRAMS

```
DEFAULT_LOADING_PROGRAMS = range(128)
```

5.10.2.5 DEFAULT_NORMALIZATION_BASELINE

```
int DEFAULT_NORMALIZATION_BASELINE = 60
```

5.10.2.6 DEFAULT_NOTE_DENSITY_BINS

```
int DEFAULT_NOTE_DENSITY_BINS = np.arange(12) * 3 + 1
```

5.10.2.7 DEFAULT_NOTE_LENGTH

```
int DEFAULT_NOTE_LENGTH = BEAT_LENGTH * 2
```

5.10.2.8 DEFAULT_PITCH_RANGE

```
DEFAULT_PITCH_RANGE = range(21, 109)
```

5.10.2.9 DEFAULT_RESOLUTION

```
int DEFAULT_RESOLUTION = 220
```

5.10.2.10 DEFAULT_SAVING_PROGRAM

```
int DEFAULT_SAVING_PROGRAM = 1
```

5.10.2.11 DEFAULT_TEMPO

```
int DEFAULT_TEMPO = 120
```

5.10.2.12 DEFAULT_TIME_SHIFT_BINS

```
float DEFAULT_TIME_SHIFT_BINS = 1.15 ** np.arange(32) / 65
```

5.10.2.13 DEFAULT_VELOCITY

```
int DEFAULT_VELOCITY = 64
```

5.10.2.14 DEFAULT_VELOCITY_RANGE

```
DEFAULT_VELOCITY_RANGE = range(21, 109)
```

5.10.2.15 DEFAULT_VELOCITY_STEPS

```
int DEFAULT_VELOCITY_STEPS = 32
```

5.10.2.16 DEFAULT_WINDOW_SIZE

```
int DEFAULT_WINDOW_SIZE = BEAT_LENGTH * 4
```

5.10.2.17 es

```
es = EventSeq.from_note_seq(NoteSeq.from_midi_file(path))
```

5.10.2.18 MIN_NOTE_LENGTH

```
int MIN_NOTE_LENGTH = BEAT_LENGTH / 2
```

5.10.2.19 path

```
int path
```

Initial value:

```
1 =  sys.argv[1] if len(
2         sys.argv) > 1 else 'dataset/midi/ecomp/BLINOV02.mid'
```

5.10.2.20 USE_VELOCITY

```
bool USE_VELOCITY = True
```

5.11 coopertunes.datatools.process Namespace Reference

Functions

- def get_preprocessing (name)
- def preprocess_classic_piano (midi_root, save_dir, num_workers)
- def preprocess_midi2sequence (path)
- def preprocess_wav2spectrogram (path)

Variables

- midi_root
- num_workers
- save_dir

5.11.1 Function Documentation

5.11.1.1 get_preprocessing()

```
def coopertunes.datatools.process.get_preprocessing (
              name )
```

Returns processing funtion for dataset.
Name should be in DATA_NAMES values.

5.11.1.2 preprocess_classic_piano()

```
def coopertunes.datatools.process.preprocess_classic_piano (
              midi_root,
              save_dir,
              num_workers )
```

5.11.1.3 preprocess_midi2sequence()

```
def coopertunes.datatools.process.preprocess_midi2sequence (
              path )
```

Preprocess single midi under given path to event sequence.

5.11.1.4 preprocess_wav2spectrogram()

```
def coopertunes.datatools.process.preprocess_wav2spectrogram (
              path )
```

Preprocess single wav under given path to spectrogram

5.11.2 Variable Documentation

5.11.2.1 midi_root

```
midi_root
```

5.11.2.2 num_workers

```
num_workers
```

5.11.2.3 save_dir

```
save_dir
```

5.12 coopertunes.distributed Namespace Reference

Functions

- def fix_unset_envs ()
- def get_free_port ()
- def get_world_size ()
- Callable global_leader_only (Callable|None fn=None, *default=None)
- def global_rank ()
- def is_global_leader ()
- def is_local_leader ()
- Callable local_leader_only (fn=None, *default=None)
- def local_rank ()

5.12.1 Function Documentation

5.12.1.1 fix_unset_envs()

```
def coopertunes.distributed.fix_unset_envs ( )
```

5.12.1.2 get_free_port()

```
def coopertunes.distributed.get_free_port ( )
```

5.12.1.3 get_world_size()

```
def coopertunes.distributed.get_world_size ( )
```

5.12.1.4 global_leader_only()

```
Callable coopertunes.distributed.global_leader_only (
            Callable | None  fn = None,
            * default = None )
```

5.12.1.5 global_rank()

```
def coopertunes.distributed.global_rank ( )
```

5.12.1.6 is_global_leader()

```
def coopertunes.distributed.is_global_leader ( )
```

5.12.1.7 is_local_leader()

```
def coopertunes.distributed.is_local_leader ( )
```

5.12.1.8 local_leader_only()

```
Callable coopertunes.distributed.local_leader_only (
             fn = None,
            * default = None )
```

5.12.1.9 local_rank()

```
def coopertunes.distributed.local_rank ( )
```

5.13 coopertunes.hparams Namespace Reference

Namespaces

- Audio2Mel
- GANSynth
- hparams
- MelGan
- MelSpecVAE
- MelSpecVQVAE
- PerformanceRNN

Functions

- def get_hparams (str model_name)

5.13.1 Function Documentation

5.13.1.1 get_hparams()

```
def coopertunes.hparams.get_hparams (
            str model_name )
```

5.14 coopertunes.hparams.Audio2Mel Namespace Reference

Classes

- class Audio2MelHParams

5.15 coopertunes.hparams.GANSynth Namespace Reference

Classes

- class DiscriminatorHParams
- class GANSynthHParams
- class GeneratorHParams

5.16 coopertunes.hparams.hparams Namespace Reference

Classes

- class HParams

5.17 coopertunes.hparams.MelGan Namespace Reference

Classes

- class MelGanHParams

5.18 coopertunes.hparams.MelSpecVAE Namespace Reference

Classes

- class MelSpecVAEHParams

5.19 coopertunes.hparams.MelSpecVQVAE Namespace Reference

Classes

- class MelSpecVQVAEHParams

5.20 coopertunes.hparams.PerformanceRNN Namespace Reference

Classes

- class PerformanceRNNHParams

5.21 coopertunes.logger Namespace Reference

Classes

- class Logger

5.21.1 Detailed Description

```
Module with logger utils class
```

5.22 coopertunes.models Namespace Reference

Namespaces

- Audio2Mel
- GANSynth
- MelGan
- MelSpecVAE
- MelSpecVQVAE
- model
- PerformanceRNN

Functions

- def get_model (model_name)

5.22.1 Function Documentation

5.22.1.1 get_model()

```
def coopertunes.models.get_model (
              model_name )
```

5.23 coopertunes.models.Audio2Mel Namespace Reference

Classes

- class Audio2Mel

5.24 coopertunes.models.GANSynth Namespace Reference

Classes

- class Discriminator
- class Generator

5.24.1 Detailed Description

```
GANSynth model implementation based on:
GANSynth paper - https://arxiv.org/pdf/1902.08710.pdf
PGGAN paper - https://arxiv.org/pdf/1710.10196.pdf
ACGAN paper - https://arxiv.org/pdf/1610.09585.pdf
```

5.25 coopertunes.models.MelGan Namespace Reference

Classes

- class MelGanDiscriminator
- class MelGanGenerator
- class MelGanNLayerDiscriminator
- class ResnetBlock

Functions

- def weights_init (m)
- def WNConv1d (*args, **kwargs)
- def WNConvTranspose1d (*args, **kwargs)

5.25.1 Function Documentation

5.25.1.1 weights_init()

```
def coopertunes.models.MelGan.weights_init (
              m )
```

5.25.1.2 WNConv1d()

```
def coopertunes.models.MelGan.WNConv1d (
             * args,
             ** kwargs )
```

5.25.1.3 WNConvTranspose1d()

```
def coopertunes.models.MelGan.WNConvTranspose1d (
             * args,
             ** kwargs )
```

5.26 coopertunes.models.MelSpecVAE Namespace Reference

Classes

- class MelSpecVAE

5.27 coopertunes.models.MelSpecVQVAE Namespace Reference

Classes

- class MelSpecVQVAE
- class ResidualLayer
- class VectorQuantizer

5.28 coopertunes.models.model Namespace Reference

Classes

- class Model

5.29 coopertunes.models.PerformanceRNN Namespace Reference

Classes

- class PerformanceRNN

5.29.1 Detailed Description

```
Slightly modified code from https://github.com/djosix/Performance-RNN-PyTorch on MIT licence.
```

5.30 coopertunes.supervisors Namespace Reference

Namespaces

- Audio2Mel
- GANSynth
- MelGan
- MelSpecVAE
- MelSpecVQVAE
- PerformanceRNN

5.31 coopertunes.supervisors.Audio2Mel Namespace Reference

Classes

- class Audio2MelSupervisor

5.32 coopertunes.supervisors.GANSynth Namespace Reference

Classes

- class GANSynthSupervisor

5.33 coopertunes.supervisors.MelGan Namespace Reference

Classes

- class MelGanSupervisor

Variables

- audio2mel_hparams = Audio2MelHParams()
- mel_hparams = MelGanHParams()
- melGanAudio2mel = Audio2Mel(audio2mel_hparams)
- melGanDiscriminator = MelGanDiscriminator(mel_hparams)
- melGanGgenerator = MelGanGenerator(mel_hparams)
- supervisor

5.33.1 Variable Documentation

5.33.1.1 audio2mel_hparams

```
audio2mel_hparams = Audio2MelHParams()
```

5.33.1.2 mel_hparams

```
mel_hparams = MelGanHParams()
```

5.33.1.3 melGanAudio2mel

```
melGanAudio2mel = Audio2Mel(audio2mel_hparams)
```

5.33.1.4 melGanDiscriminator

```
melGanDiscriminator = MelGanDiscriminator(mel_hparams)
```

5.33.1.5 melGanGgenerator

```
melGanGgenerator = MelGanGenerator(mel_hparams)
```

5.33.1.6 supervisor

```
supervisor
```

Initial value:

```
1 =  MelGanSupervisor(
2         melGanGgenerator,
3         melGanDiscriminator,
4         melGanAudio2mel,
5         get_default_device(),
6         mel_hparams,
7     )
```

5.34 coopertunes.supervisors.MelSpecVAE Namespace Reference

Classes

- class MelSpecVAESupervisor

Variables

- backend
- init_method
- mel_hparams = MelSpecVAEHParams()
- mel_spec_vae = MelSpecVAE(mel_hparams)
- rank
- vae_supervisor
- world_size

5.34.1 Variable Documentation

5.34.1.1 backend

```
backend
```

5.34.1.2 init_method

```
init_method
```

5.34.1.3 mel_hparams

```
mel_hparams = MelSpecVAEHParams()
```

5.34.1.4 mel_spec_vae

```
mel_spec_vae = MelSpecVAE(mel_hparams)
```

5.34.1.5 rank

```
rank
```

5.34.1.6 vae_supervisor

```
vae_supervisor
```

Initial value:

```
1 =  MelSpecVAESupervisor(
2         mel_spec_vae, torch.device("cuda"), mel_hparams
3     )
```

5.34.1.7 world_size

```
world_size
```

5.35 coopertunes.supervisors.MelSpecVQVAE Namespace Reference

Classes

- class MelSpecVQVAESupervisor

Variables

- backend
- init_method
- mel_hparams = MelSpecVQVAEHParams()
- mel_spec_vae = MelSpecVQVAE(mel_hparams)
- rank
- vae_supervisor
- world_size

5.35.1 Variable Documentation

5.35.1.1 backend

```
backend
```

5.35.1.2 init_method

```
init_method
```

5.35.1.3 mel_hparams

```
mel_hparams = MelSpecVQVAEHParams()
```

5.35.1.4 mel_spec_vae

```
mel_spec_vae = MelSpecVQVAE(mel_hparams)
```

5.35.1.5 rank

```
rank
```

5.35.1.6 vae_supervisor

```
vae_supervisor
```

Initial value:

```
1 =  MelSpecVQVAESupervisor(
2         mel_spec_vae, torch.device("cuda"), mel_hparams
3     )
```

5.35.1.7 world_size

```
world_size
```

5.36 coopertunes.supervisors.PerformanceRNN Namespace Reference

Classes

- class PerformanceRNNSupervisor

Variables

- string device = "cuda:0"
- hparams = PerformanceRNNHParams()
- model = PerformanceRNNattentive(hparams)
- supervisor = PerformanceRNNSupervisor(model, device, hparams)

5.36.1 Variable Documentation

5.36.1.1 device

```
string device = "cuda:0"
```

5.36.1.2 hparams

```
hparams = PerformanceRNNHParams()
```

5.36.1.3 model

```
model = PerformanceRNNattentive(hparams)
```

5.36.1.4 supervisor

```
supervisor = PerformanceRNNSupervisor(model, device, hparams)
```

5.37 coopertunes.utils Namespace Reference

Classes

- class PixelNormalization
- class PrintLayer

Functions

- def calc_n_params (module)
- def compute_gradient_norm (parameters, norm_type=2)
- def convert_audios2mels (audios, sample_rate, n_mels=80, hop_len=256, n_fft=1024, win_len=1024, fmin=0.0, fmax=8000.0)
- def convert_audios2mels_h (audios, hparams)
- def convert_mels2audios (mels, sample_rate, n_griffin_lim_iter=16, hop_len=256, n_fft=1024, win_len=1024, fmin=0.0, fmax=8000.0)
- def convert_mels2audios_h (mels, hparams)
- def dconv_same_padding (kernel_size, dilation=1)
- def dict2params (d, f=",")
- def event_indeces_to_midi_file (event_indeces, midi_file_name, velocity_scale=0.8)
- def find_files_by_extensions (root, exts=[ ])
- def get_default_device ()
- def log_debug (∗args, ∗∗kwargs)
- def log_error (∗args, ∗∗kwargs)
- def log_info (∗args, ∗∗kwargs)
- def log_warning (∗args, ∗∗kwargs)
- def normalize_audio (audio, float from_sample_rate, float to_sample_rate)
- def params2dict (p, f=",", e="=")
- def plot_audio (audio, out_fp=None)
- def plot_mel (mel, out_fp=None)
- def save_sample (file_path, sampling_rate, audio)
- def set_seed (int seed)
- def setup_cuda_debug (bool cuda_debug_mode=False)
- def transposition (events, controls, offset=0)

Variables

- list AUDIO_EXTENSIONS = [".wav", ".flac", ".mp3"]
- L = TypeVar("L")
- list MIDI_EXTENSIONS = [".midi", ".mid"]
- propagate

5.37.1 Detailed Description

Module with utilities

5.37.2 Function Documentation

5.37.2.1 calc_n_params()

```
def coopertunes.utils.calc_n_params (
              module )
```

5.37.2.2 compute_gradient_norm()

```
def coopertunes.utils.compute_gradient_norm (
              parameters,
              norm_type = 2 )
```

5.37.2.3 convert_audios2mels()

```
def coopertunes.utils.convert_audios2mels (
              audios,
              sample_rate,
              n_mels = 80,
              hop_len = 256,
              n_fft = 1024,
              win_len = 1024,
              fmin = 0.0,
              fmax = 8000.0 )
```

5.37.2.4 convert_audios2mels_h()

```
def coopertunes.utils.convert_audios2mels_h (
              audios,
              hparams )
```

5.37.2.5 convert_mels2audios()

```
def coopertunes.utils.convert_mels2audios (
              mels,
              sample_rate,
              n_griffin_lim_iter = 16,
              hop_len = 256,
              n_fft = 1024,
              win_len = 1024,
              fmin = 0.0,
              fmax = 8000.0 )
```

5.37.2.6 convert_mels2audios_h()

```
def coopertunes.utils.convert_mels2audios_h (
              mels,
              hparams )
```

5.37.2.7 dconv_same_padding()

```
def coopertunes.utils.dconv_same_padding (
              kernel_size,
              dilation = 1 )
```

5.37.2.8 dict2params()

```
def coopertunes.utils.dict2params (
              d,
              f = "," )
```

5.37.2.9 event_indeces_to_midi_file()

```
def coopertunes.utils.event_indeces_to_midi_file (
              event_indeces,
              midi_file_name,
              velocity_scale = 0.8 )
```

5.37.2.10 find_files_by_extensions()

```
def coopertunes.utils.find_files_by_extensions (
              root,
              exts = [] )
```

5.37.2.11 get_default_device()

```
def coopertunes.utils.get_default_device ( )
```

5.37.2.12 log_debug()

```
def coopertunes.utils.log_debug (
             * args,
             ** kwargs )
```

5.37.2.13 log_error()

```
def coopertunes.utils.log_error (
             * args,
             ** kwargs )
```

5.37.2.14 log_info()

```
def coopertunes.utils.log_info (
             * args,
             ** kwargs )
```

5.37.2.15 log_warning()

```
def coopertunes.utils.log_warning (
             * args,
             ** kwargs )
```

5.37.2.16 normalize_audio()

```
def coopertunes.utils.normalize_audio (
              audio,
             float from_sample_rate,
             float to_sample_rate )
```

5.37.2.17 params2dict()

```
def coopertunes.utils.params2dict (
              p,
              f = ",",
              e = "=" )
```

5.37.2.18 plot_audio()

```
def coopertunes.utils.plot_audio (
              audio,
              out_fp = None )
```

5.37.2.19 plot_mel()

```
def coopertunes.utils.plot_mel (
              mel,
              out_fp = None )
```

5.37.2.20 save_sample()

```
def coopertunes.utils.save_sample (
              file_path,
              sampling_rate,
              audio )
```

```
Helper function to save sample

Args:
    file_path (str or pathlib.Path): save file path
    sampling_rate (int): sampling rate of audio (usually 22050)
    audio (torch.FloatTensor): torch array containing audio in [-1, 1]
```

5.37.2.21 set_seed()

```
def coopertunes.utils.set_seed (
             int seed )
```

5.37.2.22 setup_cuda_debug()

```
def coopertunes.utils.setup_cuda_debug (
             bool  cuda_debug_mode = False )
```

5.37.2.23 transposition()

```
def coopertunes.utils.transposition (
              events,
              controls,
              offset = 0 )
```

5.37.3 Variable Documentation

5.37.3.1 AUDIO_EXTENSIONS

```
list AUDIO_EXTENSIONS = [".wav", ".flac", ".mp3"]
```

5.37.3.2 L

```
L = TypeVar("L")
```

5.37.3.3 MIDI_EXTENSIONS

```
list MIDI_EXTENSIONS = [".midi", ".mid"]
```

5.37.3.4 propagate

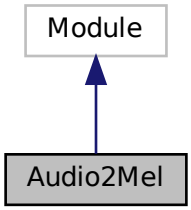
```
propagate
```

Chapter 6

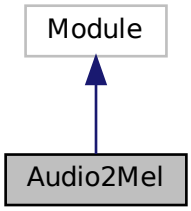
Class Documentation

6.1 Audio2Mel Class Reference

Inheritance diagram for Audio2Mel:



Collaboration diagram for Audio2Mel:



Public Member Functions

- def __init__ (self, Audio2MelHParams hparams)
- def forward (self, audio)
- def inference (self, audio)

Public Attributes

- hop_length
- n_fft
- n_mel_channels
- sampling_rate
- win_length

6.1.1 Constructor & Destructor Documentation

6.1.1.1 __init__()

```
def __init__ (
              self,
             Audio2MelHParams hparams )
```

6.1.2 Member Function Documentation

6.1.2.1 forward()

```
def forward (
              self,
              audio )
```

6.1.2.2 inference()

```
def inference (
              self,
              audio )
```

6.1.3 Member Data Documentation

6.1.3.1 hop_length

```
hop_length
```

6.1.3.2 n_fft

```
n_fft
```

6.1.3.3 n_mel_channels

```
n_mel_channels
```

6.1.3.4 sampling_rate

```
sampling_rate
```

6.1.3.5 win_length

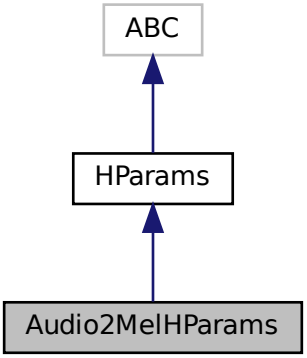
```
win_length
```

The documentation for this class was generated from the following file:

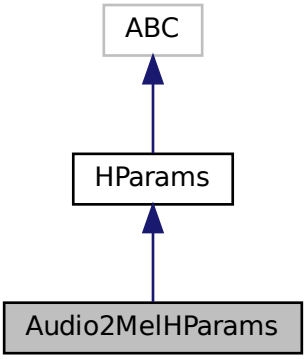
- /home/oskar/Studia/wimu/coopertunes/coopertunes/models/Audio2Mel.py

6.2 Audio2MelHParams Class Reference

Inheritance diagram for Audio2MelHParams:



Collaboration diagram for Audio2MelHParams:



Public Member Functions

- def __init__ (self, Optional[Union[Path, dict[str, Any]]] hparams=None)

Public Attributes

- hop_length
- mel_fmax

- mel_fmin
- n_fft
- n_mel_channels
- sampling_rate
- win_length

6.2.1 Constructor & Destructor Documentation

6.2.1.1 __init__()

```
def __init__ (
              self,
             Optional[Union[Path, dict[str, Any]]]  hparams = None )
```

6.2.2 Member Data Documentation

6.2.2.1 hop_length

```
hop_length
```

6.2.2.2 mel_fmax

```
mel_fmax
```

6.2.2.3 mel_fmin

```
mel_fmin
```

6.2.2.4 n_fft

```
n_fft
```

6.2.2.5 n_mel_channels

```
n_mel_channels
```

6.2.2.6 sampling_rate

```
sampling_rate
```

6.2.2.7 win_length

```
win_length
```

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/Audio2Mel.py

6.3 Audio2MelSupervisor Class Reference

Public Member Functions

- def __init__ (self, Audio2Mel model, torch.device device, Audio2MelHParams hparams)
- def convert (self, audio)

Public Attributes

- device
- hparams
- model

6.3.1 Constructor & Destructor Documentation

6.3.1.1 __init__()

```
def __init__ (
              self,
             Audio2Mel model,
             torch.device device,
             Audio2MelHParams  hparams )
```

6.3.2 Member Function Documentation

6.3.2.1 convert()

```
def convert (
              self,
              audio )
```

```
Args:
    audio (torch.tensor): PyTorch tensor containing audio (batch_size, timesteps)
Returns:
    torch.tensor: log-mel-spectrogram
        computed on input audio (batch_size, mel bank filters, timesteps)
```

6.3.3 Member Data Documentation

6.3.3.1 device

```
device
```

6.3.3.2 hparams

```
hparams
```

6.3.3.3 model

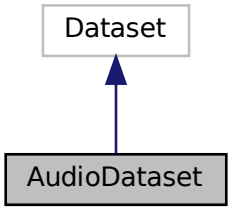
```
model
```

The documentation for this class was generated from the following file:

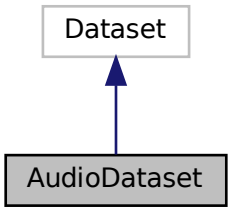
- /home/oskar/Studia/wimu/coopertunes/coopertunes/supervisors/Audio2Mel.py

6.4 AudioDataset Class Reference

Inheritance diagram for AudioDataset:



Collaboration diagram for AudioDataset:



Public Member Functions

- def __getitem__ (self, index)
- def __init__ (self, training_files, segment_length, sampling_rate, augment=True)
- def __len__ (self)
- def load_wav_to_torch (self, full_path)

Public Attributes

- audio_files
- augment
- sampling_rate
- segment_length

6.4.1 Detailed Description

```
This is the main class that returns audio frames
```

6.4.2 Constructor & Destructor Documentation

6.4.2.1 __init__()

```
def __init__ (
              self,
              training_files,
              segment_length,
              sampling_rate,
              augment = True )
```

6.4.3 Member Function Documentation

6.4.3.1 __getitem__()

```
def __getitem__ (
              self,
              index )
```

6.4.3.2 __len__()

```
def __len__ (
              self )
```

6.4.3.3 load_wav_to_torch()

```
def load_wav_to_torch (
              self,
              full_path )
```

```
Loads wavdata into torch array
```

6.4.4 Member Data Documentation

6.4.4.1 audio_files

```
audio_files
```

6.4.4.2 augment

```
augment
```

6.4.4.3 sampling_rate

```
sampling_rate
```

6.4.4.4 segment_length

```
segment_length
```

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/datasets/AudioDataset.py

6.5 Control Class Reference

Public Member Functions

- def __init__ (self, pitch_histogram, note_density)
- def __repr__ (self)
- def to_array (self)

Public Attributes

- note_density
- pitch_histogram

6.5.1 Constructor & Destructor Documentation

6.5.1.1 __init__()

```
def __init__ (
              self,
              pitch_histogram,
              note_density )
```

6.5.2 Member Function Documentation

6.5.2.1 __repr__()

```
def __repr__ (
              self )
```

6.5.2.2 to_array()

```
def to_array (
              self )
```

6.5.3 Member Data Documentation

6.5.3.1 note_density

```
note_density
```

6.5.3.2 pitch_histogram

```
pitch_histogram
```

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/datatools/miditools.py

6.6 ControlSeq Class Reference

Public Member Functions

- def __init__ (self, controls)
- def to_compressed_array (self)

Static Public Member Functions

- def dim ()
- def feat_dims ()
- def feat_ranges ()
- def from_event_seq (event_seq)
- def recover_compressed_array (array)

Public Attributes

- controls

Static Public Attributes

- note_density_bins = DEFAULT_NOTE_DENSITY_BINS
- window_size = DEFAULT_WINDOW_SIZE

6.6.1 Constructor & Destructor Documentation

6.6.1.1 __init__()

```
def __init__ (
              self,
              controls )
```

6.6.2 Member Function Documentation

6.6.2.1 dim()

```
def dim ( )  [static]
```

6.6.2.2 feat_dims()

```
def feat_dims ( )  [static]
```

6.6.2.3 feat_ranges()

```
def feat_ranges ( )  [static]
```

6.6.2.4 from_event_seq()

```
def from_event_seq (
              event_seq )  [static]
```

6.6.2.5 recover_compressed_array()

```
def recover_compressed_array (
              array )  [static]
```

6.6.2.6 to_compressed_array()

```
def to_compressed_array (
              self )
```

6.6.3 Member Data Documentation

6.6.3.1 controls

```
controls
```

6.6.3.2 note_density_bins

```
note_density_bins = DEFAULT_NOTE_DENSITY_BINS  [static]
```

6.6.3.3 window_size

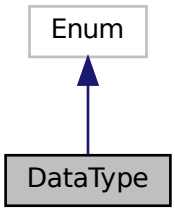
```
window_size = DEFAULT_WINDOW_SIZE  [static]
```

The documentation for this class was generated from the following file:

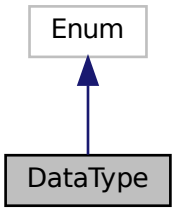
- /home/oskar/Studia/wimu/coopertunes/coopertunes/datatools/miditools.py

6.7 DataType Class Reference

Inheritance diagram for DataType:



Collaboration diagram for DataType:



Static Public Attributes

- string AUDIO = "audio"
- string MIDI = "midi"

6.7.1 Member Data Documentation

6.7.1.1 AUDIO

```
string AUDIO = "audio"  [static]
```

6.7.1.2 MIDI

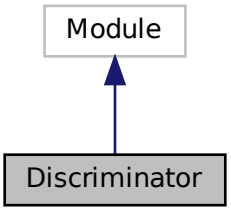
```
string MIDI = "midi"  [static]
```

The documentation for this class was generated from the following file:

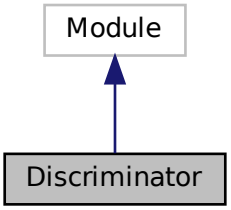
- /home/oskar/Studia/wimu/coopertunes/coopertunes/datatools/config.py

6.8 Discriminator Class Reference

Inheritance diagram for Discriminator:



Collaboration diagram for Discriminator:



Public Member Functions

- def __init__ (self, DiscriminatorHParams hparams)
- def forward (self, x)

Public Attributes

- activation_function
- block0
- block1
- block2
- block3
- block4
- block5
- block6
- discriminator_output
- pitch_classifier

6.8.1 Constructor & Destructor Documentation

6.8.1.1 __init__()

```
def __init__ (
              self,
             DiscriminatorHParams hparams )
```

6.8.2 Member Function Documentation

6.8.2.1 forward()

```
def forward (
              self,
              x )
```

6.8.3 Member Data Documentation

6.8.3.1 activation_function

```
activation_function
```

6.8.3.2 block0

block0

6.8.3.3 block1

block1

6.8.3.4 block2

block2

6.8.3.5 block3

block3

6.8.3.6 block4

block4

6.8.3.7 block5

block5

6.8.3.8 block6

block6

6.8.3.9 discriminator_output

discriminator_output

6.8.3.10 pitch_classifier

```
pitch_classifier
```

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/models/GANSynth.py

6.9 DiscriminatorHParams Class Reference

Public Member Functions

- def __init__ (self)

Public Attributes

- betas
- block_conv_filters
- block_conv_kernel
- block_downsample_factor
- leaky_relu_slope
- linear_in_size
- lr
- pitch_dim

6.9.1 Constructor & Destructor Documentation

6.9.1.1 __init__()

```
def __init__ (
              self )
```

6.9.2 Member Data Documentation

6.9.2.1 betas

```
betas
```

6.9.2.2 block_conv_filters

```
block_conv_filters
```

6.9.2.3 block_conv_kernel

```
block_conv_kernel
```

6.9.2.4 block_downsample_factor

```
block_downsample_factor
```

6.9.2.5 leaky_relu_slope

```
leaky_relu_slope
```

6.9.2.6 linear_in_size

```
linear_in_size
```

6.9.2.7 lr

```
lr
```

6.9.2.8 pitch_dim

```
pitch_dim
```

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/GANSynth.py

6.10 Event Class Reference

Public Member Functions

- def __init__ (self, type, time, value)
- def __repr__ (self)

Public Attributes

- time
- type
- value

6.10.1 Constructor & Destructor Documentation

6.10.1.1 __init__()

```
def __init__ (
               self,
               type,
               time,
               value )
```

6.10.2 Member Function Documentation

6.10.2.1 __repr__()

```
def __repr__ (
               self )
```

6.10.3 Member Data Documentation

6.10.3.1 time

```
time
```

6.10.3.2 type

```
type
```

6.10.3.3 value

```
value
```

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/datatools/miditools.py

6.11 EventSeq Class Reference

Public Member Functions

- def __init__ (self, events=[ ])
- def to_array (self)
- def to_note_seq (self)

Static Public Member Functions

- def dim ()
- def feat_dims ()
- def feat_ranges ()
- def from_array (event_indeces)
- def from_note_seq (note_seq)
- def get_velocity_bins ()

Public Attributes

- events

Static Public Attributes

- pitch_range = DEFAULT_PITCH_RANGE
- time_shift_bins = DEFAULT_TIME_SHIFT_BINS
- velocity_range = DEFAULT_VELOCITY_RANGE
- velocity_steps = DEFAULT_VELOCITY_STEPS

6.11.1 Constructor & Destructor Documentation

6.11.1.1 __init__()

```
def __init__ (
              self,
              events = [] )
```

6.11.2 Member Function Documentation

6.11.2.1 dim()

```
def dim ( )  [static]
```

6.11.2.2 feat_dims()

```
def feat_dims ( )  [static]
```

6.11.2.3 feat_ranges()

```
def feat_ranges ( )  [static]
```

6.11.2.4 from_array()

```
def from_array (
              event_indeces )  [static]
```

6.11.2.5 from_note_seq()

```
def from_note_seq (
              note_seq )  [static]
```

6.11.2.6 get_velocity_bins()

```
def get_velocity_bins ( )  [static]
```

6.11.2.7 to_array()

```
def to_array (
              self )
```

6.11.2.8 to_note_seq()

```
def to_note_seq (
              self )
```

6.11.3 Member Data Documentation

6.11.3.1 events

```
events
```

6.11.3.2 pitch_range

```
pitch_range = DEFAULT_PITCH_RANGE  [static]
```

6.11.3.3 time_shift_bins

```
time_shift_bins = DEFAULT_TIME_SHIFT_BINS  [static]
```

6.11.3.4 velocity_range

```
velocity_range = DEFAULT_VELOCITY_RANGE  [static]
```

6.11.3.5 velocity_steps

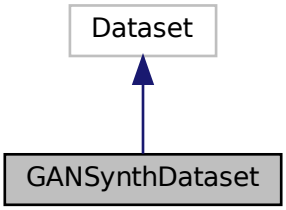
```
velocity_steps = DEFAULT_VELOCITY_STEPS  [static]
```

The documentation for this class was generated from the following file:

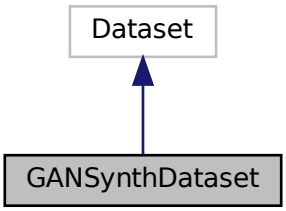
- /home/oskar/Studia/wimu/coopertunes/coopertunes/datatools/miditools.py

6.12 GANSynthDataset Class Reference

Inheritance diagram for GANSynthDataset:



Collaboration diagram for GANSynthDataset:



Public Member Functions

- def __getitem__ (self, idx)
- def __init__ (self, Path train_data_dir)
- def __len__ (self)

Public Attributes

- filepaths
- metadata

6.12.1 Detailed Description

```
Dataset class for NSynth [json/wav] - download from
https://magenta.tensorflow.org/datasets/nsynth
Dataset used for GANSynth model training
dataset folder should have structure "example.json" with metadata about
audio files and directory audio containing audio files with .wav file extension
```

6.12.2 Constructor & Destructor Documentation

6.12.2.1 __init__()

```
def __init__ (
              self,
             Path train_data_dir )
```

6.12.3 Member Function Documentation

6.12.3.1 __getitem__()

```
def __getitem__ (
               self,
               idx )
```

6.12.3.2 __len__()

```
def __len__ (
               self )
```

6.12.4 Member Data Documentation

6.12.4.1 filepaths

```
filepaths
```

6.12.4.2 metadata

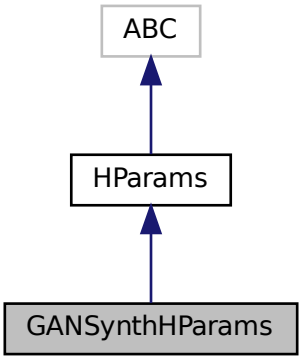
```
metadata
```

The documentation for this class was generated from the following file:

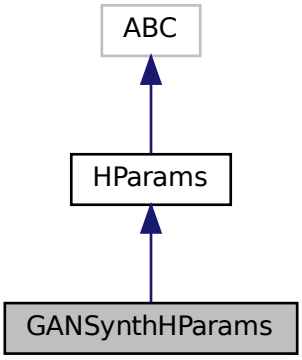
- /home/oskar/Studia/wimu/coopertunes/coopertunes/datasets/GANSynthDataset.py

6.13 GANSynthHParams Class Reference

Inheritance diagram for GANSynthHParams:



Collaboration diagram for GANSynthHParams:



Public Member Functions

- def __init__ (self)

Public Attributes

- discriminator
- epochs
- generator
- train_data_dir

6.13.1 Constructor & Destructor Documentation

6.13.1.1 __init__()

```
def __init__ (
              self )
```

Reimplemented from HParams.

6.13.2 Member Data Documentation

6.13.2.1 discriminator

```
discriminator
```

6.13.2.2 epochs

```
epochs
```

6.13.2.3 generator

```
generator
```

6.13.2.4 train_data_dir

```
train_data_dir
```

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/GANSynth.py

6.14 GANSynthSupervisor Class Reference

Public Member Functions

- def __init__ (self, Tuple models, device, GANSynthHParams hparams)
- def train (self)

Public Attributes

- device
- discriminator
- discriminator_optimizer
- epoch
- generator
- generator_optimizer
- hparams
- step
- train_loader

6.14.1 Detailed Description

```
Supervisor for GANSynth training
After init you can launch training with `train` method
```

6.14.2 Constructor & Destructor Documentation

6.14.2.1 __init__()

```
def __init__ (
               self,
              Tuple models,
               device,
              GANSynthHParams hparams )
```

6.14.3 Member Function Documentation

6.14.3.1 train()

```
def train (
              self )
```

6.14.4 Member Data Documentation

6.14.4.1 device

`device`

6.14.4.2 discriminator

`discriminator`

6.14.4.3 discriminator_optimizer

`discriminator_optimizer`

6.14.4.4 epoch

`epoch`

6.14.4.5 generator

`generator`

6.14.4.6 generator_optimizer

`generator_optimizer`

6.14.4.7 hparams

`hparams`

6.14.4.8 step

`step`

6.14.4.9 train_loader

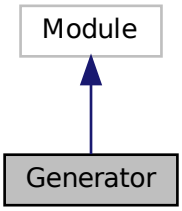
`train_loader`

The documentation for this class was generated from the following file:

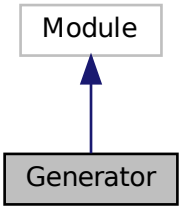
- /home/oskar/Studia/wimu/coopertunes/coopertunes/supervisors/GANSynth.py

6.15 Generator Class Reference

Inheritance diagram for Generator:



Collaboration diagram for Generator:



Public Member Functions

- def __init__ (self, GeneratorHParams hparams)
- def forward (self, z, pitch)

Public Attributes

- activation_function
- block0
- block1
- block2
- block3
- block4
- block5
- block6

6.15.1 Constructor & Destructor Documentation

6.15.1.1 __init__()

```
def __init__ (
              self,
             GeneratorHParams hparams )
```

6.15.2 Member Function Documentation

6.15.2.1 forward()

```
def forward (
              self,
              z,
              pitch )
```

6.15.3 Member Data Documentation

6.15.3.1 activation_function

```
activation_function
```

6.15.3.2 block0

block0

6.15.3.3 block1

block1

6.15.3.4 block2

block2

6.15.3.5 block3

block3

6.15.3.6 block4

block4

6.15.3.7 block5

block5

6.15.3.8 block6

block6

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/models/GANSynth.py

6.16 GeneratorHParams Class Reference

Public Member Functions

- def __init__ (self)

Public Attributes

- betas
- block_dconv_filters
- block_dconv_kernel
- block_upsample_factor
- eps
- first_dconv_kernel
- latent_dim
- leaky_relu_slope
- lr
- pitch_dim

6.16.1 Constructor & Destructor Documentation

6.16.1.1 __init__()

```
def __init__ (
              self )
```

6.16.2 Member Data Documentation

6.16.2.1 betas

```
betas
```

6.16.2.2 block_dconv_filters

```
block_dconv_filters
```

6.16.2.3 block_dconv_kernel

block_dconv_kernel

6.16.2.4 block_upsample_factor

block_upsample_factor

6.16.2.5 eps

eps

6.16.2.6 first_dconv_kernel

first_dconv_kernel

6.16.2.7 latent_dim

latent_dim

6.16.2.8 leaky_relu_slope

leaky_relu_slope

6.16.2.9 lr

lr

6.16.2.10 pitch_dim

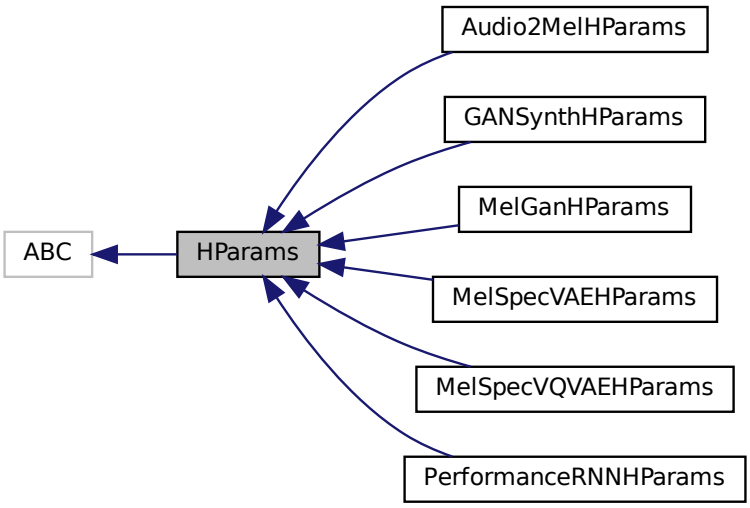
`pitch_dim`

The documentation for this class was generated from the following file:

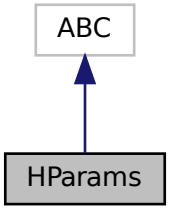
- /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/GANSynth.py

6.17 HParams Class Reference

Inheritance diagram for HParams:



Collaboration diagram for HParams:



Public Member Functions

- None __init__ (self)
- str __repr__ (self)
- def dumps_to_file (self, Optional[Path] output_dir=None)
- def update (self, Optional[Union[Path, dict[str, Any]]] hparams=None)

Public Attributes

- checkpoints_dir
- logs_dir
- train_data_dirs
- valid_data_dirs

6.17.1 Detailed Description

```
Base class with hyperparameters
```

6.17.2 Constructor & Destructor Documentation

6.17.2.1 __init__()

```
None __init__ (
               self )
```

Reimplemented in GANSynthHParams.

6.17.3 Member Function Documentation

6.17.3.1 __repr__()

```
str __repr__ (
              self )
```

6.17.3.2 dumps_to_file()

```
def dumps_to_file (
              self,
             Optional[Path]  output_dir = None )
```

6.17.3.3 update()

```
def update (
              self,
             Optional[Union[Path, dict[str, Any]]]  hparams = None )
```

6.17.4 Member Data Documentation

6.17.4.1 checkpoints_dir

```
checkpoints_dir
```

6.17.4.2 logs_dir

```
logs_dir
```

6.17.4.3 train_data_dirs

```
train_data_dirs
```

6.17.4.4 valid_data_dirs

```
valid_data_dirs
```

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/hparams.py

6.18 Logger Class Reference

Public Member Functions

- def __init__ (self, str model_name, HParams hparams, torch.device device)
- def get_summary_writer (self)
- def log_running_vals_to_tb (self, step)
- def update_running_vals (self, dict[str, Any] vals, str|None prefix=None)

Public Attributes

- device
- hparams
- log_audio
- model_name

6.18.1 Detailed Description

```
Class for logging training information.
The logger takes care of providing feedback to `stdout` and to the `tensorboard`
To add a logger for a model create two functions \
      to log the step and model and to log items to the tensorbord.
Then register the above functions in `_init_utils_fn`
```

6.18.2 Constructor & Destructor Documentation

6.18.2.1 __init__()

```
def __init__ (
              self,
             str model_name,
             HParams hparams,
             torch.device device )
```

6.18.3 Member Function Documentation

6.18.3.1 get_summary_writer()

```
def get_summary_writer (
              self )
```

6.18.3.2 log_running_vals_to_tb()

```
def log_running_vals_to_tb (
              self,
              step )
```

6.18.3.3 update_running_vals()

```
def update_running_vals (
              self,
             dict[str, Any] vals,
             str | None  prefix = None )
```

6.18.4 Member Data Documentation

6.18.4.1 device

```
device
```

6.18.4.2 hparams

```
hparams
```

6.18.4.3 log_audio

```
log_audio
```

6.18.4.4 model_name

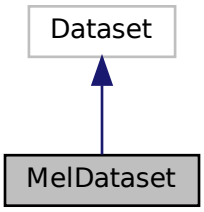
```
model_name
```

The documentation for this class was generated from the following file:

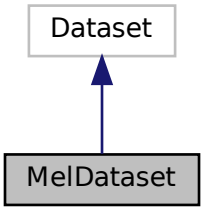
- /home/oskar/Studia/wimu/coopertunes/coopertunes/logger.py

6.19 MelDataset Class Reference

Inheritance diagram for MelDataset:



Collaboration diagram for MelDataset:



Public Member Functions

- def __getitem__ (self, idx)
- def __init__ (self, HParams hparams, list[Path]|Path data_dirs)
- def __len__ (self)

Public Attributes

- data_dirs
- filepaths
- hparams

6.19.1 Constructor & Destructor Documentation

6.19.1.1 __init__()

```
def __init__ (
              self,
             HParams hparams,
             list[Path] | Path data_dirs )
```

6.19.2 Member Function Documentation

6.19.2.1 __getitem__()

```
def __getitem__ (
              self,
              idx )
```

6.19.2.2 __len__()

```
def __len__ (
              self )
```

6.19.3 Member Data Documentation

6.19.3.1 data_dirs

```
data_dirs
```

6.19.3.2 filepaths

```
filepaths
```

6.19.3.3 hparams

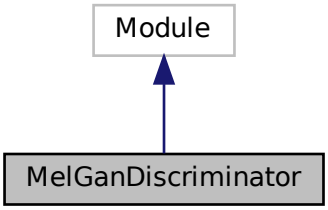
```
hparams
```

The documentation for this class was generated from the following file:

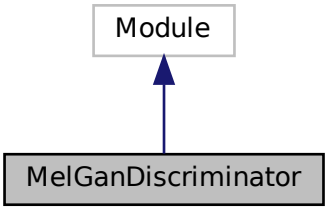
- /home/oskar/Studia/wimu/coopertunes/coopertunes/datasets/MelDataset.py

6.20 MelGanDiscriminator Class Reference

Inheritance diagram for MelGanDiscriminator:



Collaboration diagram for MelGanDiscriminator:



Public Member Functions

- def __init__ (self, MelGanHParams hparams)
- def forward (self, x)

Public Attributes

- downsample
- model

6.20.1 Constructor & Destructor Documentation

6.20.1.1 __init__()

```
def __init__ (
              self,
             MelGanHParams hparams )
```

6.20.2 Member Function Documentation

6.20.2.1 forward()

```
def forward (
              self,
              x )
```

6.20.3 Member Data Documentation

6.20.3.1 downsample

```
downsample
```

6.20.3.2 model

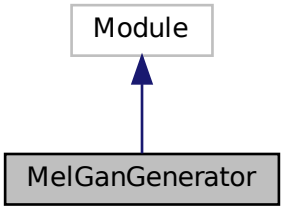
```
model
```

The documentation for this class was generated from the following file:

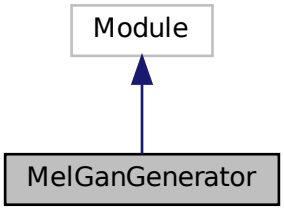
- /home/oskar/Studia/wimu/coopertunes/coopertunes/models/MelGan.py

6.21 MelGanGenerator Class Reference

Inheritance diagram for MelGanGenerator:



Collaboration diagram for MelGanGenerator:



Public Member Functions

- def __init__ (self, MelGanHParams hparams)
- def forward (self, x)
- def inference (self, x)

Public Attributes

- hop_length
- model

6.21.1 Detailed Description

```
Generating raw audio from mel spectrogram with GAN generator.
```

6.21.2 Constructor & Destructor Documentation

6.21.2.1 __init__()

```
def __init__ (
              self,
             MelGanHParams hparams )
```

6.21.3 Member Function Documentation

6.21.3.1 forward()

```
def forward (
              self,
              x )
```

6.21.3.2 inference()

```
def inference (
              self,
              x )
```

6.21.4 Member Data Documentation

6.21.4.1 hop_length

```
hop_length
```

6.21.4.2 model

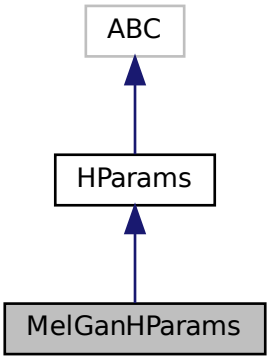
```
model
```

The documentation for this class was generated from the following file:

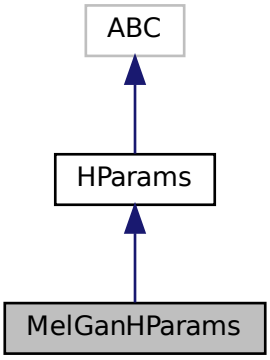
- /home/oskar/Studia/wimu/coopertunes/coopertunes/models/MelGan.py

6.22 MelGanHParams Class Reference

Inheritance diagram for MelGanHParams:



Collaboration diagram for MelGanHParams:



Public Member Functions

- def __init__ (self, Optional[Union[Path, dict[str, Any]]] hparams=None)

Public Attributes

- adam_betas
- default_checkpoint
- learning_rate
- summary_path

6.22.1 Detailed Description

```
Parameters for MelGan and MelGanSupervisor.
```

6.22.2 Constructor & Destructor Documentation

6.22.2.1 __init__()

```
def __init__ (
              self,
             Optional[Union[Path, dict[str, Any]]]  hparams = None )
```

6.22.3 Member Data Documentation

6.22.3.1 adam_betas

```
adam_betas
```

6.22.3.2 default_checkpoint

```
default_checkpoint
```

6.22.3.3 learning_rate

```
learning_rate
```

6.22.3.4 summary_path

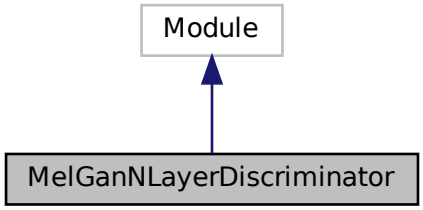
```
summary_path
```

The documentation for this class was generated from the following file:

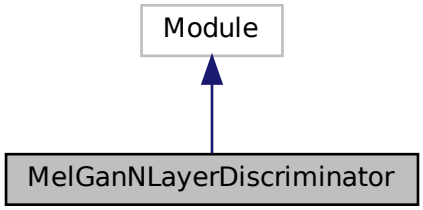
- /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/MelGan.py

6.23 MelGanNLayerDiscriminator Class Reference

Inheritance diagram for MelGanNLayerDiscriminator:



Collaboration diagram for MelGanNLayerDiscriminator:



Public Member Functions

- def __init__ (self, MelGanHParams hparams)
- def forward (self, x)

Public Attributes

- model

6.23.1 Constructor & Destructor Documentation

6.23.1.1 __init__()

```
def __init__ (
              self,
             MelGanHParams hparams )
```

6.23.2 Member Function Documentation

6.23.2.1 forward()

```
def forward (
              self,
              x )
```

6.23.3 Member Data Documentation

6.23.3.1 model

```
model
```

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/models/MelGan.py

6.24 MelGanSupervisor Class Reference

Public Member Functions

- def __call__ (self, np.ndarray spectrogram)
- def __init__ (self, MelGanGenerator generator, MelGanDiscriminator discriminator, Audio2Mel audio2mel, torch.device device, MelGanHParams hparams)
- def eval (self, mel_recon)
- def load_pretrained (self)
- def test (self, str audio_path, str output_path="melgan_result.wav")
- def train (self)

Public Attributes

- audio2mel
- device
- epoch
- hparams
- netD
- netG
- optD
- optG
- step
- val_dl

6.24.1 Detailed Description

```
Supervisor for MelGAN
After init you can launch training with `train` method
You can test trained checkpoints with `test` method on given raw audio
```

6.24.2 Constructor & Destructor Documentation

6.24.2.1 __init__()

```
def __init__ (
              self,
             MelGanGenerator generator,
             MelGanDiscriminator discriminator,
             Audio2Mel audio2mel,
             torch.device device,
             MelGanHParams hparams )
```

6.24.3 Member Function Documentation

6.24.3.1 __call__()

```
def __call__ (
              self,
             np.ndarray spectrogram )
```

```
Converts spectrogram to raw audio.
spectrogram's shape is [1, bins, len]
```

6.24.3.2 eval()

```
def eval (
              self,
              mel_recon )
```

6.24.3.3 load_pretrained()

```
def load_pretrained (
              self )
```

6.24.3.4 test()

```
def test (
              self,
             str audio_path,
             str  output_path = "melgan_result.wav" )
```

```
It allows to reconstruct given raw audio using currently loaded generator.
Audio will be converted to Mel Spectrogram, then back to raw audio, and saved.
```

6.24.3.5 train()

```
def train (
              self )
```

6.24.4 Member Data Documentation

6.24.4.1 audio2mel

```
audio2mel
```

6.24.4.2 device

```
device
```

6.24.4.3 epoch

epoch

6.24.4.4 hparams

hparams

6.24.4.5 netD

netD

6.24.4.6 netG

netG

6.24.4.7 optD

optD

6.24.4.8 optG

optG

6.24.4.9 step

step

6.24.4.10 val_dl

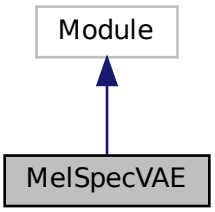
`val_dl`

The documentation for this class was generated from the following file:

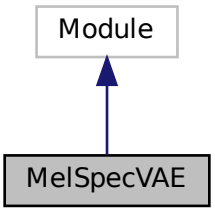
- /home/oskar/Studia/wimu/coopertunes/coopertunes/supervisors/MelGan.py

6.25 MelSpecVAE Class Reference

Inheritance diagram for MelSpecVAE:



Collaboration diagram for MelSpecVAE:



Public Member Functions

- def __init__ (self, MelSpecVAEHParams hparams)
- torch.Tensor decode (self, torch.Tensor z)
- list[torch.Tensor] encode (self, torch.Tensor x)
- def forward (self, torch.Tensor x)
- def inference (self, torch.Tensor z)
- dict loss_function (self, torch.Tensor y_recon, torch.Tensor y_target, torch.Tensor mu, torch.Tensor log_var)
- torch.Tensor reparameterize (self, torch.Tensor mu, torch.Tensor logvar)

Public Attributes

- before_latent
- decoder
- decoder_input
- encoder
- fc_mu
- fc_var
- final_layer
- kld_weight
- last_filter
- latent_dim
- pool_factor

6.25.1 Detailed Description

```
Generating mels from noise with vanilla VAE
```

6.25.2 Constructor & Destructor Documentation

6.25.2.1 __init__()

```
def __init__ (
              self,
             MelSpecVAEHParams hparams )
```

6.25.3 Member Function Documentation

6.25.3.1 decode()

```
torch.Tensor decode (
              self,
             torch.Tensor z )
```

```
Maps the given latent codes
onto the image space.
```

6.25.3.2 encode()

```
list[torch.Tensor] encode (
              self,
             torch.Tensor x )
```

Encodes the input by passing through the encoder network
and returns the latent codes

6.25.3.3 forward()

```
def forward (
              self,
             torch.Tensor x )
```

6.25.3.4 inference()

```
def inference (
              self,
             torch.Tensor z )
```

6.25.3.5 loss_function()

```
dict loss_function (
              self,
             torch.Tensor y_recon,
             torch.Tensor y_target,
             torch.Tensor mu,
             torch.Tensor  log_var )
```

6.25.3.6 reparameterize()

```
torch.Tensor reparameterize (
              self,
             torch.Tensor mu,
             torch.Tensor logvar )
```

Reparameterization trick to sample from N(mu, var) from
N(0,1).

6.25.4 Member Data Documentation

6.25.4.1 before_latent

`before_latent`

6.25.4.2 decoder

`decoder`

6.25.4.3 decoder_input

`decoder_input`

6.25.4.4 encoder

`encoder`

6.25.4.5 fc_mu

`fc_mu`

6.25.4.6 fc_var

`fc_var`

6.25.4.7 final_layer

`final_layer`

6.25.4.8 kld_weight

```
kld_weight
```

6.25.4.9 last_filter

```
last_filter
```

6.25.4.10 latent_dim

```
latent_dim
```

6.25.4.11 pool_factor

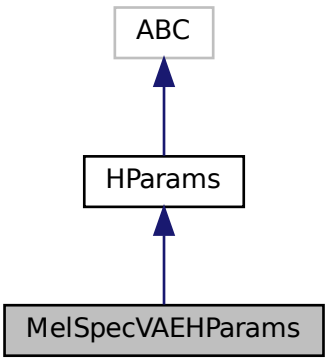
```
pool_factor
```

The documentation for this class was generated from the following file:

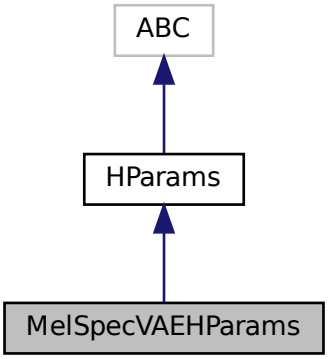
- /home/oskar/Studia/wimu/coopertunes/coopertunes/models/MelSpecVAE.py

6.26 MelSpecVAEHParams Class Reference

Inheritance diagram for MelSpecVAEHParams:



Collaboration diagram for MelSpecVAEHParams:



Public Member Functions

- def __init__ (self, Optional[Union[Path, dict[str, Any]]] hparams=None)
- def ds_cfg (self)

Additional Inherited Members

6.26.1 Constructor & Destructor Documentation

6.26.1.1 __init__()

```
def __init__ (
              self,
             Optional[Union[Path, dict[str, Any]]]  hparams = None )
```

6.26.2 Member Function Documentation

6.26.2.1 ds_cfg()

```
def ds_cfg (
              self )
```

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/MelSpecVAE.py

6.27 MelSpecVAESupervisor Class Reference

Public Member Functions

- def __init__ (self, MelSpecVAE model, torch.device device, MelSpecVAEHParams hparams)
- def eval (self)
- def train (self)

Public Attributes

- device
- engines
- epoch
- hparams
- model
- step
- val_dl

6.27.1 Detailed Description

```
Supervisor for MelSpecVAESupervisor
After init you can launch training with `train` method
```

6.27.2 Constructor & Destructor Documentation

6.27.2.1 __init__()

```
def __init__ (
              self,
             MelSpecVAE model,
             torch.device device,
             MelSpecVAEHParams  hparams )
```

6.27.3 Member Function Documentation

6.27.3.1 eval()

```
def eval (
              self )
```

6.27.3.2 train()

```
def train (
              self )
```

6.27.4 Member Data Documentation

6.27.4.1 device

```
device
```

6.27.4.2 engines

```
engines
```

6.27.4.3 epoch

```
epoch
```

6.27.4.4 hparams

```
hparams
```

6.27.4.5 model

```
model
```

6.27.4.6 step

```
step
```

6.27.4.7 val_dl

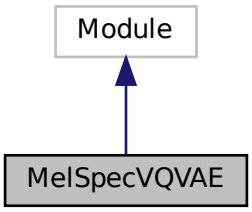
`val_dl`

The documentation for this class was generated from the following file:

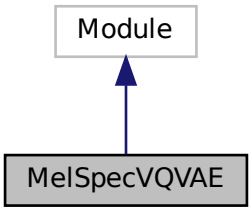
- /home/oskar/Studia/wimu/coopertunes/coopertunes/supervisors/MelSpecVAE.py

6.28 MelSpecVQVAE Class Reference

Inheritance diagram for MelSpecVQVAE:



Collaboration diagram for MelSpecVQVAE:



Public Member Functions

- None __init__ (self, MelSpecVQVAEHParams hparams)
- torch.Tensor decode (self, torch.Tensor z)
- list[torch.Tensor] encode (self, torch.Tensor x)
- def forward (self, torch.Tensor x)
- def inference (self, torch.Tensor x)
- dict[str, Any] loss_function (self, torch.Tensor y_recon, torch.Tensor y_target, vq_loss)

Public Attributes

- decoder
- embedding_dim
- encoder
- num_embeddings
- vq_layer
- vq_weight

6.28.1 Detailed Description

```
Generating mels from noise with VQVAE
```

6.28.2 Constructor & Destructor Documentation

6.28.2.1 __init__()

```
None __init__ (
               self,
              MelSpecVQVAEHParams hparams )
```

6.28.3 Member Function Documentation

6.28.3.1 decode()

```
torch.Tensor decode (
               self,
              torch.Tensor z )
```

```
Maps the given latent codes
onto the image space.
```

6.28.3.2 encode()

```
list[torch.Tensor] encode (
               self,
              torch.Tensor x )
```

```
Encodes the input by passing through the encoder network
and returns the latent codes.
```

6.28.3.3 forward()

```
def forward (
              self,
             torch.Tensor x )
```

6.28.3.4 inference()

```
def inference (
              self,
             torch.Tensor x )
```

Given an input image x, returns the reconstructed image

6.28.3.5 loss_function()

```
dict[str, Any] loss_function (
              self,
             torch.Tensor y_recon,
             torch.Tensor y_target,
              vq_loss )
```

6.28.4 Member Data Documentation

6.28.4.1 decoder

```
decoder
```

6.28.4.2 embedding_dim

```
embedding_dim
```

6.28.4.3 encoder

```
encoder
```

6.28.4.4 num_embeddings

```
num_embeddings
```

6.28.4.5 vq_layer

```
vq_layer
```

6.28.4.6 vq_weight

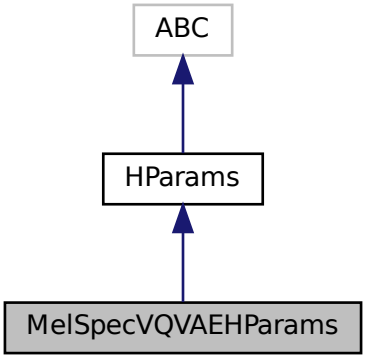
```
vq_weight
```

The documentation for this class was generated from the following file:

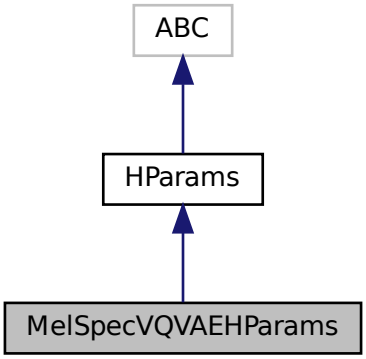
- /home/oskar/Studia/wimu/coopertunes/coopertunes/models/MelSpecVQVAE.py

6.29 MelSpecVQVAEHParams Class Reference

Inheritance diagram for MelSpecVQVAEHParams:



Collaboration diagram for MelSpecVQVAEHParams:



Public Member Functions

- def __init__ (self, Optional[Union[Path, dict[str, Any]]] hparams=None)
- def ds_cfg (self)

Additional Inherited Members

6.29.1 Constructor & Destructor Documentation

6.29.1.1 __init__()

```
def __init__ (
              self,
             Optional[Union[Path, dict[str, Any]]]  hparams = None )
```

6.29.2 Member Function Documentation

6.29.2.1 ds_cfg()

```
def ds_cfg (
              self )
```

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/MelSpecVQVAE.py

6.30 MelSpecVQVAESupervisor Class Reference

Public Member Functions

- def __init__ (self, MelSpecVQVAE model, torch.device device, MelSpecVQVAEHParams hparams)
- def eval (self)
- def train (self)

Public Attributes

- device
- engines
- epoch
- hparams
- model
- step
- val_dl

6.30.1 Detailed Description

```
Supervisor for MelSpecVQVAESupervisor
After init you can launch training with `train` method
```

6.30.2 Constructor & Destructor Documentation

6.30.2.1 __init__()

```
def __init__ (
              self,
             MelSpecVQVAE model,
             torch.device device,
             MelSpecVQVAEHParams  hparams )
```

6.30.3 Member Function Documentation

6.30.3.1 eval()

```
def eval (
              self )
```

6.30.3.2 train()

```
def train (
              self )
```

6.30.4 Member Data Documentation

6.30.4.1 device

```
device
```

6.30.4.2 engines

```
engines
```

6.30.4.3 epoch

```
epoch
```

6.30.4.4 hparams

```
hparams
```

6.30.4.5 model

```
model
```

6.30.4.6 step

```
step
```

6.30.4.7 val_dl

```
val_dl
```

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/supervisors/MelSpecVQVAE.py

6.31 MidiDataset Class Reference

Public Member Functions

- def __init__ (self, root, verbose=False)
- def __repr__ (self)
- def batches (self, batch_size, window_size, stride_size)

Public Attributes

- avglen
- root
- samples
- seqlens

6.31.1 Constructor & Destructor Documentation

6.31.1.1 __init__()

```
def __init__ (
              self,
              root,
              verbose = False )
```

6.31.2 Member Function Documentation

6.31.2.1 __repr__()

```
def __repr__ (
              self )
```

6.31.2.2 batches()

```
def batches (
              self,
              batch_size,
              window_size,
              stride_size )
```

6.31.3 Member Data Documentation

6.31.3.1 avglen

```
avglen
```

6.31.3.2 root

```
root
```

6.31.3.3 samples

```
samples
```

6.31.3.4 seqlens

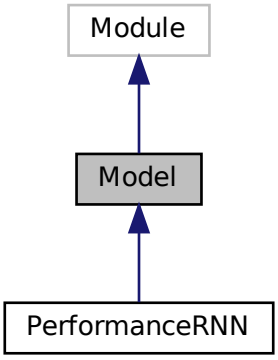
```
seqlens
```

The documentation for this class was generated from the following file:

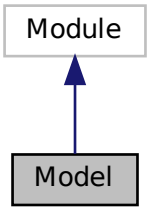
- /home/oskar/Studia/wimu/coopertunes/coopertunes/datasets/MidiDataset.py

6.32 Model Class Reference

Inheritance diagram for Model:



Collaboration diagram for Model:



Public Member Functions

- def __init__ (self, HParams hparams)
- def forward (self, **kwargs)
- def inference (self, **kwargs)

6.32.1 Detailed Description

```
Abstract class for all coopertunes models
```

6.32.2 Constructor & Destructor Documentation

6.32.2.1 __init__()

```
def __init__ (
               self,
              HParams hparams )
```

6.32.3 Member Function Documentation

6.32.3.1 forward()

```
def forward (
              self,
             ** kwargs )

Returns data after forward.
Calculate gradients.
```

6.32.3.2 inference()

```
def inference (
              self,
             ** kwargs )

Returns data after forward.
Does not calculate gradients.
```

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/models/model.py

6.33 NoteSeq Class Reference

Public Member Functions

- def __init__ (self, notes=[ ])
- def add_notes (self, notes)
- def adjust_pitches (self, offset)
- def adjust_time (self, offset)
- def adjust_velocities (self, offset)
- def copy (self)
- def to_midi (self, program=DEFAULT_SAVING_PROGRAM, resolution=DEFAULT_RESOLUTION, tempo=DEFAULT_TEMPO)
- def to_midi_file (self, path, ∗args, ∗∗kwargs)
- def trim_overlapped_notes (self, min_interval=0)

Static Public Member Functions

- def from_midi (midi, programs=DEFAULT_LOADING_PROGRAMS)
- def from_midi_file (path, ∗args, ∗∗kwargs)
- def merge (∗note_seqs)

Public Attributes

- notes

6.33.1 Constructor & Destructor Documentation

6.33.1.1 __init__()

```
def __init__ (
              self,
              notes = [] )
```

6.33.2 Member Function Documentation

6.33.2.1 add_notes()

```
def add_notes (
              self,
              notes )
```

6.33.2.2 adjust_pitches()

```
def adjust_pitches (
              self,
              offset )
```

6.33.2.3 adjust_time()

```
def adjust_time (
              self,
              offset )
```

6.33.2.4 adjust_velocities()

```
def adjust_velocities (
              self,
              offset )
```

6.33.2.5 copy()

```
def copy (
              self )
```

6.33.2.6 from_midi()

```
def from_midi (
              midi,
              programs = DEFAULT_LOADING_PROGRAMS )  [static]
```

6.33.2.7 from_midi_file()

```
def from_midi_file (
              path,
             * args,
             ** kwargs )  [static]
```

6.33.2.8 merge()

```
def merge (
             * note_seqs )  [static]
```

6.33.2.9 to_midi()

```
def to_midi (
              self,
              program = DEFAULT_SAVING_PROGRAM,
              resolution = DEFAULT_RESOLUTION,
              tempo = DEFAULT_TEMPO )
```

6.33.2.10 to_midi_file()

```
def to_midi_file (
              self,
              path,
             * args,
             ** kwargs )
```

6.33.2.11 trim_overlapped_notes()

```
def trim_overlapped_notes (
              self,
              min_interval = 0 )
```

6.33.3 Member Data Documentation

6.33.3.1 notes

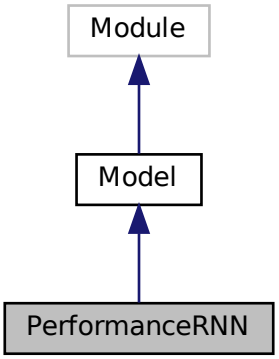
```
notes
```

The documentation for this class was generated from the following file:

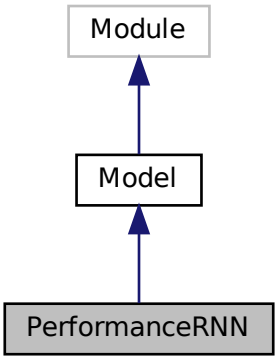
- /home/oskar/Studia/wimu/coopertunes/coopertunes/datatools/miditools.py

6.34 PerformanceRNN Class Reference

Inheritance diagram for PerformanceRNN:



Collaboration diagram for PerformanceRNN:



Public Member Functions

- def __init__ (self, PerformanceRNNHParams hparams, str device="cuda:0")
- def beam_search (self, init, steps, beam_size, controls=None, temperature=1.0, stochastic=False, verbose=False)
- def expand_controls (self, controls, steps)
- def forward (self, event, control=None, hidden=None)
- def generate (self, init, steps, events=None, controls=None, greedy=1.0, temperature=1.0, teacher_forcing↩ _ratio=1.0, output_type='index', verbose=False)
- def get_primary_event (self, batch_size)
- def init_to_hidden (self, init)

Public Attributes

- concat_dim
- concat_input_fc
- concat_input_fc_activation
- control_dim
- device
- event_dim
- event_embedding
- gru
- gru_layers
- hidden_dim
- init_dim
- inithid_fc
- inithid_fc_activation
- input_dim
- output_dim
- output_fc
- output_fc_activation
- primary_event

6.34.1 Constructor & Destructor Documentation

6.34.1.1 __init__()

```
def __init__ (
              self,
             PerformanceRNNHParams hparams,
             str  device = "cuda:0" )
```

6.34.2 Member Function Documentation

6.34.2.1 beam_search()

```
def beam_search (
              self,
              init,
              steps,
              beam_size,
              controls = None,
              temperature = 1.0,
              stochastic = False,
              verbose = False )
```

6.34.2.2 expand_controls()

```
def expand_controls (
              self,
              controls,
              steps )
```

6.34.2.3 forward()

```
def forward (
              self,
              event,
              control = None,
              hidden = None )
```

6.34.2.4 generate()

```
def generate (
              self,
              init,
              steps,
              events = None,
              controls = None,
              greedy = 1.0,
              temperature = 1.0,
              teacher_forcing_ratio = 1.0,
              output_type = 'index',
              verbose = False )
```

6.34.2.5 get_primary_event()

```
def get_primary_event (
              self,
              batch_size )
```

6.34.2.6 init_to_hidden()

```
def init_to_hidden (
              self,
              init )
```

6.34.3 Member Data Documentation

6.34.3.1 concat_dim

```
concat_dim
```

6.34.3.2 concat_input_fc

```
concat_input_fc
```

6.34.3.3 concat_input_fc_activation

```
concat_input_fc_activation
```

6.34.3.4 control_dim

```
control_dim
```

6.34.3.5 device

```
device
```

6.34.3.6 event_dim

```
event_dim
```

6.34.3.7 event_embedding

```
event_embedding
```

6.34.3.8 gru

```
gru
```

6.34.3.9 gru_layers

```
gru_layers
```

6.34.3.10 hidden_dim

```
hidden_dim
```

6.34.3.11 init_dim

```
init_dim
```

6.34.3.12 inithid_fc

```
inithid_fc
```

6.34.3.13 inithid_fc_activation

```
inithid_fc_activation
```

6.34.3.14 input_dim

```
input_dim
```

6.34.3.15 output_dim

```
output_dim
```

6.34.3.16 output_fc

```
output_fc
```

6.34.3.17 output_fc_activation

```
output_fc_activation
```

6.34.3.18 primary_event

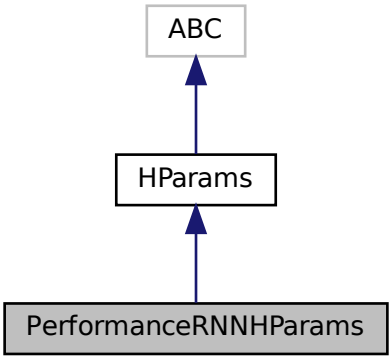
`primary_event`

The documentation for this class was generated from the following file:

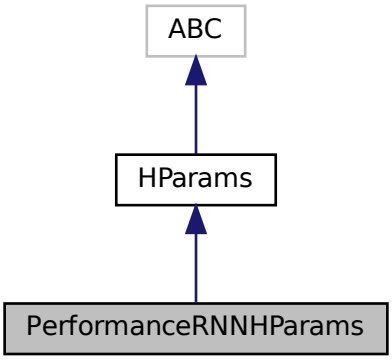
- /home/oskar/Studia/wimu/coopertunes/coopertunes/models/PerformanceRNN.py

6.35 PerformanceRNNHParams Class Reference

Inheritance diagram for PerformanceRNNHParams:



Collaboration diagram for PerformanceRNNHParams:



Public Member Functions

- def __init__ (self, Optional[Union[Path, dict[str, Any]]] hparams=None)

Additional Inherited Members

6.35.1 Constructor & Destructor Documentation

6.35.1.1 __init__()

```
def __init__ (
              self,
             Optional[Union[Path, dict[str, Any]]]  hparams = None )
```

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/PerformanceRNN.py

6.36 PerformanceRNNSupervisor Class Reference

Public Member Functions

- def __init__ (self, PerformanceRNN model, torch.device device, PerformanceRNNHParams hparams)
- def generate (self, output_dir, control=None, init_zero=False, use_beam_search=False)
- def load_pretrained (self)
- def train (self)

Public Attributes

- batch_size
- control_dim
- control_ratio
- data_path
- device
- enable_logging
- event_dim
- hparams
- learning_rate
- model
- optimizer
- reset_optimizer
- saving_interval
- sess_path
- step
- stride_size
- teacher_forcing_ratio
- use_transposition
- val_dl
- window_size

6.36.1 Detailed Description

```
Supervisor for PerformanceRNNSupervisor
After init you can launch training with `train` method
You can generate sample using "generate" method.
```

6.36.2 Constructor & Destructor Documentation

6.36.2.1 __init__()

```
def __init__ (
              self,
             PerformanceRNN model,
             torch.device device,
             PerformanceRNNHParams hparams )
```

6.36.3 Member Function Documentation

6.36.3.1 generate()

```
def generate (
              self,
              output_dir,
              control = None,
              init_zero = False,
              use_beam_search = False )
```

```
Generate music sample.
It uses options specified at hparams, and:
output dir: where to save generated samples.
control: key of generated audio. example C dur is '1,0,1,0,1,1,0,1,0,1,0,1;3'.
    May be None, or path to Midi file for guidance.
```

6.36.3.2 load_pretrained()

```
def load_pretrained (
              self )
```

6.36.3.3 train()

```
def train (
              self )
```

6.36.4 Member Data Documentation

6.36.4.1 batch_size

```
batch_size
```

6.36.4.2 control_dim

```
control_dim
```

6.36.4.3 control_ratio

```
control_ratio
```

6.36.4.4 data_path

```
data_path
```

6.36.4.5 device

```
device
```

6.36.4.6 enable_logging

```
enable_logging
```

6.36.4.7 event_dim

```
event_dim
```

6.36.4.8 hparams

```
hparams
```

6.36.4.9 learning_rate

```
learning_rate
```

6.36.4.10 model

```
model
```

6.36.4.11 optimizer

```
optimizer
```

6.36.4.12 reset_optimizer

```
reset_optimizer
```

6.36.4.13 saving_interval

```
saving_interval
```

6.36.4.14 sess_path

```
sess_path
```

6.36.4.15 step

`step`

6.36.4.16 stride_size

`stride_size`

6.36.4.17 teacher_forcing_ratio

`teacher_forcing_ratio`

6.36.4.18 use_transposition

`use_transposition`

6.36.4.19 val_dl

`val_dl`

6.36.4.20 window_size

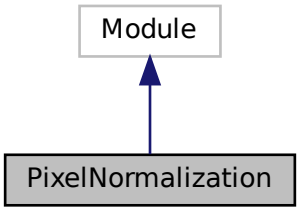
`window_size`

The documentation for this class was generated from the following file:

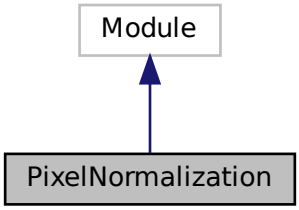
- /home/oskar/Studia/wimu/coopertunes/coopertunes/supervisors/PerformanceRNN.py

6.37 PixelNormalization Class Reference

Inheritance diagram for PixelNormalization:



Collaboration diagram for PixelNormalization:



Public Member Functions

- def __init__ (self, eps)
- def forward (self, x)

Public Attributes

- eps

6.37.1 Detailed Description

```
Pixel normalization proposed in https://arxiv.org/pdf/1902.08710.pdf
```

6.37.2 Constructor & Destructor Documentation

6.37.2.1 __init__()

```
def __init__ (
               self,
               eps )
```

6.37.3 Member Function Documentation

6.37.3.1 forward()

```
def forward (
               self,
               x )
```

6.37.4 Member Data Documentation

6.37.4.1 eps

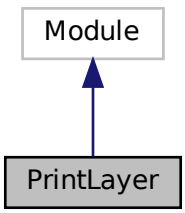
```
eps
```

The documentation for this class was generated from the following file:

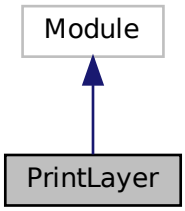
- /home/oskar/Studia/wimu/coopertunes/coopertunes/utils.py

6.38 PrintLayer Class Reference

Inheritance diagram for PrintLayer:



Collaboration diagram for PrintLayer:



Public Member Functions

- def __init__ (self)
- def forward (self, x)

6.38.1 Constructor & Destructor Documentation

6.38.1.1 __init__()

```
def __init__ (
              self )
```

6.38.2 Member Function Documentation

6.38.2.1 forward()

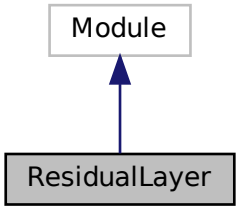
```
def forward (
              self,
              x )
```

The documentation for this class was generated from the following file:

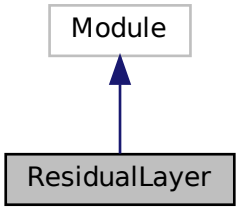
- /home/oskar/Studia/wimu/coopertunes/coopertunes/utils.py

6.39 ResidualLayer Class Reference

Inheritance diagram for ResidualLayer:



Collaboration diagram for ResidualLayer:



Public Member Functions

- def __init__ (self, int in_channels, int out_channels)
- torch.Tensor forward (self, torch.Tensor x)

Public Attributes

- resblock

6.39.1 Constructor & Destructor Documentation

6.39.1.1 __init__()

```
def __init__ (
               self,
              int in_channels,
              int out_channels )
```

6.39.2 Member Function Documentation

6.39.2.1 forward()

```
torch.Tensor forward (
               self,
              torch.Tensor x )
```

6.39.3 Member Data Documentation

6.39.3.1 resblock

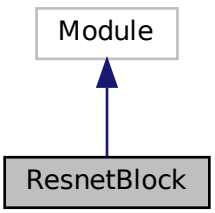
```
resblock
```

The documentation for this class was generated from the following file:

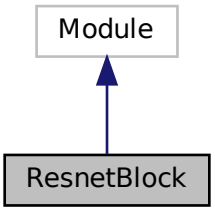
- /home/oskar/Studia/wimu/coopertunes/coopertunes/models/MelSpecVQVAE.py

6.40 ResnetBlock Class Reference

Inheritance diagram for ResnetBlock:



Collaboration diagram for ResnetBlock:



Public Member Functions

- def __init__ (self, dim, dilation=1)
- def forward (self, x)

Public Attributes

- block
- shortcut

6.40.1 Constructor & Destructor Documentation

6.40.1.1 __init__()

```
def __init__ (
              self,
              dim,
              dilation = 1 )
```

6.40.2 Member Function Documentation

6.40.2.1 forward()

```
def forward (
              self,
              x )
```

6.40.3 Member Data Documentation

6.40.3.1 block

`block`

6.40.3.2 shortcut

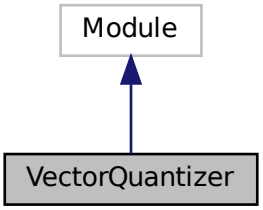
`shortcut`

The documentation for this class was generated from the following file:

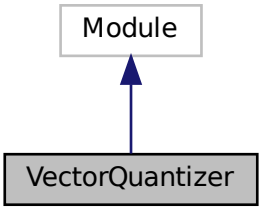
- /home/oskar/Studia/wimu/coopertunes/coopertunes/models/MelGan.py

6.41 VectorQuantizer Class Reference

Inheritance diagram for VectorQuantizer:



Collaboration diagram for VectorQuantizer:



Public Member Functions

- def __init__ (self, int num_embeddings, int embedding_dim, float beta=0.25)
- tuple[torch.Tensor, torch.Tensor] forward (self, torch.Tensor latents)

Public Attributes

- beta
- D
- embedding
- K

6.41.1 Detailed Description

```
Reference:
[1] https://github.com/deepmind/sonnet/blob/v2/sonnet/src/nets/vqvae.py
```

6.41.2 Constructor & Destructor Documentation

6.41.2.1 __init__()

```
def __init__ (
              self,
             int num_embeddings,
             int embedding_dim,
             float  beta = 0.25 )
```

6.41.3 Member Function Documentation

6.41.3.1 forward()

```
tuple[torch.Tensor, torch.Tensor] forward (
              self,
             torch.Tensor latents )
```

6.41.4 Member Data Documentation

6.41.4.1 beta

`beta`

6.41.4.2 D

`D`

6.41.4.3 embedding

`embedding`

6.41.4.4 K

`K`

The documentation for this class was generated from the following file:

- /home/oskar/Studia/wimu/coopertunes/coopertunes/models/MelSpecVQVAE.py

Chapter 7

File Documentation

7.1 /home/oskar/Studia/wimu/coopertunes/coopertunes/__init__.py File Reference

Namespaces

- coopertunes

7.2 /home/oskar/Studia/wimu/coopertunes/coopertunes/datasets/__init__.py File Reference

Namespaces

- coopertunes.datasets

7.3 /home/oskar/Studia/wimu/coopertunes/coopertunes/datatools/__init__.py File Reference

Namespaces

- coopertunes.datatools

7.4 /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/__init__.py File Reference

Namespaces

- coopertunes.hparams

Functions

- def get_hparams (str model_name)

7.5 /home/oskar/Studia/wimu/coopertunes/coopertunes/models/__init__.py File Reference

Namespaces

- coopertunes.models

Functions

- def get_model (model_name)

7.6 /home/oskar/Studia/wimu/coopertunes/coopertunes/supervisors/__init__.py File Reference

Namespaces

- coopertunes.supervisors

7.7 /home/oskar/Studia/wimu/coopertunes/coopertunes/datasets/AudioDataset.py File Reference

Classes

- class AudioDataset

Namespaces

- coopertunes.datasets.AudioDataset

Functions

- def files_to_list (filename)

7.8 /home/oskar/Studia/wimu/coopertunes/coopertunes/datasets/GANSynthDataset.py File Reference

Classes

- class GANSynthDataset

Namespaces

- coopertunes.datasets.GANSynthDataset

7.9 /home/oskar/Studia/wimu/coopertunes/coopertunes/datasets/MelDataset.py File Reference

Classes

- class MelDataset

Namespaces

- coopertunes.datasets.MelDataset

7.10 /home/oskar/Studia/wimu/coopertunes/coopertunes/datasets/MidiDataset.py File Reference

Classes

- class MidiDataset

Namespaces

- coopertunes.datasets.MidiDataset

7.11 /home/oskar/Studia/wimu/coopertunes/coopertunes/datatools/config.py File Reference

Classes

- class DataType

Namespaces

- coopertunes.datatools.config

Variables

- dictionary DATA_NAMES

7.12 /home/oskar/↩ Studia/wimu/coopertunes/coopertunes/datatools/downloaders.py File Reference

Namespaces

- coopertunes.datatools.downloaders

Functions

- def download_classic_piano (output_dir)
- def download_dataset (output_dir, data_type, name)
- def download_file (url, output_dir)
- def get_datatype_dataset_downloaders (DataType data_type)

7.13 /home/oskar/↩ Studia/wimu/coopertunes/coopertunes/datatools/miditools.py File Reference

Classes

- class Control
- class ControlSeq
- class Event
- class EventSeq
- class NoteSeq

Namespaces

- coopertunes.datatools.miditools

Variables

- int BEAT_LENGTH = 60 / DEFAULT_TEMPO
- c
- cs = ControlSeq.from_event_seq(es)
- DEFAULT_LOADING_PROGRAMS = range(128)
- int DEFAULT_NORMALIZATION_BASELINE = 60
- int DEFAULT_NOTE_DENSITY_BINS = np.arange(12) ∗ 3 + 1
- int DEFAULT_NOTE_LENGTH = BEAT_LENGTH ∗ 2
- DEFAULT_PITCH_RANGE = range(21, 109)
- int DEFAULT_RESOLUTION = 220
- int DEFAULT_SAVING_PROGRAM = 1
- int DEFAULT_TEMPO = 120
- float DEFAULT_TIME_SHIFT_BINS = 1.15 ∗∗ np.arange(32) / 65
- int DEFAULT_VELOCITY = 64
- DEFAULT_VELOCITY_RANGE = range(21, 109)
- int DEFAULT_VELOCITY_STEPS = 32
- int DEFAULT_WINDOW_SIZE = BEAT_LENGTH ∗ 4
- es = EventSeq.from_note_seq(NoteSeq.from_midi_file(path))
- int MIN_NOTE_LENGTH = BEAT_LENGTH / 2
- int path
- bool USE_VELOCITY = True

7.14 /home/oskar/↩ Studia/wimu/coopertunes/coopertunes/datatools/process.py File Reference

Namespaces

- coopertunes.datatools.process

Functions

- def get_preprocessing (name)
- def preprocess_classic_piano (midi_root, save_dir, num_workers)
- def preprocess_midi2sequence (path)
- def preprocess_wav2spectrogram (path)

Variables

- midi_root
- num_workers
- save_dir

7.15 /home/oskar/Studia/wimu/coopertunes/coopertunes/distributed.py File Reference

Namespaces

- coopertunes.distributed

Functions

- def fix_unset_envs ()
- def get_free_port ()
- def get_world_size ()
- Callable global_leader_only (Callable|None fn=None, *default=None)
- def global_rank ()
- def is_global_leader ()
- def is_local_leader ()
- Callable local_leader_only (fn=None, *default=None)
- def local_rank ()

7.16 /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/↩ Audio2Mel.py File Reference

Classes

- class Audio2MelHParams

Namespaces

- coopertunes.hparams.Audio2Mel

7.17 /home/oskar/Studia/wimu/coopertunes/coopertunes/models/↩ Audio2Mel.py File Reference

Classes

- class Audio2Mel

Namespaces

- coopertunes.models.Audio2Mel

7.18 /home/oskar/Studia/wimu/coopertunes/coopertunes/supervisors/↩ Audio2Mel.py File Reference

Classes

- class Audio2MelSupervisor

Namespaces

- coopertunes.supervisors.Audio2Mel

7.19 /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/↩ GANSynth.py File Reference

Classes

- class DiscriminatorHParams
- class GANSynthHParams
- class GeneratorHParams

Namespaces

- coopertunes.hparams.GANSynth

7.20 /home/oskar/Studia/wimu/coopertunes/coopertunes/models/GANSynth.py File Reference

Classes

- class Discriminator
- class Generator

Namespaces

- coopertunes.models.GANSynth

7.21 /home/oskar/Studia/wimu/coopertunes/coopertunes/supervisors/GANSynth.py File Reference

Classes

- class GANSynthSupervisor

Namespaces

- coopertunes.supervisors.GANSynth

7.22 /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/hparams.py File Reference

Classes

- class HParams

Namespaces

- coopertunes.hparams.hparams

7.23 /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/MelGan.py File Reference

Classes

- class MelGanHParams

Namespaces

- coopertunes.hparams.MelGan

7.24 /home/oskar/Studia/wimu/coopertunes/coopertunes/models/MelGan.py File Reference

Classes

- class MelGanDiscriminator
- class MelGanGenerator
- class MelGanNLayerDiscriminator
- class ResnetBlock

Namespaces

- coopertunes.models.MelGan

Functions

- def weights_init (m)
- def WNConv1d (∗args, ∗∗kwargs)
- def WNConvTranspose1d (∗args, ∗∗kwargs)

7.25 /home/oskar/Studia/wimu/coopertunes/coopertunes/supervisors/MelGan.py File Reference

Classes

- class MelGanSupervisor

Namespaces

- coopertunes.supervisors.MelGan

Variables

- audio2mel_hparams = Audio2MelHParams()
- mel_hparams = MelGanHParams()
- melGanAudio2mel = Audio2Mel(audio2mel_hparams)
- melGanDiscriminator = MelGanDiscriminator(mel_hparams)
- melGanGgenerator = MelGanGenerator(mel_hparams)
- supervisor

7.26 /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/MelSpecVAE.py File Reference

Classes

- class MelSpecVAEHParams

Namespaces

- coopertunes.hparams.MelSpecVAE

7.27 /home/oskar/Studia/wimu/coopertunes/coopertunes/models/MelSpecVAE.py File Reference

Classes

- class MelSpecVAE

Namespaces

- coopertunes.models.MelSpecVAE

7.28 /home/oskar/Studia/wimu/coopertunes/coopertunes/supervisors/MelSpecVAE.py File Reference

Classes

- class MelSpecVAESupervisor

Namespaces

- coopertunes.supervisors.MelSpecVAE

Variables

- backend
- init_method
- mel_hparams = MelSpecVAEHParams()
- mel_spec_vae = MelSpecVAE(mel_hparams)
- rank
- vae_supervisor
- world_size

7.29 /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/MelSpecVQVAE.py File Reference

Classes

- class MelSpecVQVAEHParams

Namespaces

- coopertunes.hparams.MelSpecVQVAE

7.30 /home/oskar/Studia/wimu/coopertunes/coopertunes/models/MelSpecVQVAE.py File Reference

Classes

- class MelSpecVQVAE
- class ResidualLayer
- class VectorQuantizer

Namespaces

- coopertunes.models.MelSpecVQVAE

7.31 /home/oskar/Studia/wimu/coopertunes/coopertunes/supervisors/MelSpecVQVAE.py File Reference

Classes

- class MelSpecVQVAESupervisor

Namespaces

- coopertunes.supervisors.MelSpecVQVAE

Variables

- backend
- init_method
- mel_hparams = MelSpecVQVAEHParams()
- mel_spec_vae = MelSpecVQVAE(mel_hparams)
- rank
- vae_supervisor
- world_size

7.32 /home/oskar/Studia/wimu/coopertunes/coopertunes/hparams/↩ PerformanceRNN.py File Reference

Classes

- class PerformanceRNNHParams

Namespaces

- coopertunes.hparams.PerformanceRNN

7.33 /home/oskar/Studia/wimu/coopertunes/coopertunes/models/↩ PerformanceRNN.py File Reference

Classes

- class PerformanceRNN

Namespaces

- coopertunes.models.PerformanceRNN

7.34 /home/oskar/Studia/wimu/coopertunes/coopertunes/supervisors/↩ PerformanceRNN.py File Reference

Classes

- class PerformanceRNNSupervisor

Namespaces

- coopertunes.supervisors.PerformanceRNN

Variables

- string device = "cuda:0"
- hparams = PerformanceRNNHParams()
- model = PerformanceRNNattentive(hparams)
- supervisor = PerformanceRNNSupervisor(model, device, hparams)

7.35 /home/oskar/Studia/wimu/coopertunes/coopertunes/logger.py File Reference

Classes

- class Logger

Namespaces

- coopertunes.logger

7.36 /home/oskar/↩ Studia/wimu/coopertunes/coopertunes/models/model.py File Reference

Classes

- class Model

Namespaces

- coopertunes.models.model

7.37 /home/oskar/Studia/wimu/coopertunes/coopertunes/utils.py File Reference

Classes

- class PixelNormalization
- class PrintLayer

Namespaces

- coopertunes.utils

Functions

- def calc_n_params (module)
- def compute_gradient_norm (parameters, norm_type=2)
- def convert_audios2mels (audios, sample_rate, n_mels=80, hop_len=256, n_fft=1024, win_len=1024, fmin=0.0, fmax=8000.0)
- def convert_audios2mels_h (audios, hparams)
- def convert_mels2audios (mels, sample_rate, n_griffin_lim_iter=16, hop_len=256, n_fft=1024, win_len=1024, fmin=0.0, fmax=8000.0)
- def convert_mels2audios_h (mels, hparams)
- def dconv_same_padding (kernel_size, dilation=1)
- def dict2params (d, f=",")
- def event_indeces_to_midi_file (event_indeces, midi_file_name, velocity_scale=0.8)
- def find_files_by_extensions (root, exts=[ ])
- def get_default_device ()
- def log_debug (∗args, ∗∗kwargs)
- def log_error (∗args, ∗∗kwargs)
- def log_info (∗args, ∗∗kwargs)
- def log_warning (∗args, ∗∗kwargs)
- def normalize_audio (audio, float from_sample_rate, float to_sample_rate)
- def params2dict (p, f=",", e="=")
- def plot_audio (audio, out_fp=None)
- def plot_mel (mel, out_fp=None)
- def save_sample (file_path, sampling_rate, audio)
- def set_seed (int seed)
- def setup_cuda_debug (bool cuda_debug_mode=False)
- def transposition (events, controls, offset=0)

Variables

- list AUDIO_EXTENSIONS = [".wav", ".flac", ".mp3"]
- L = TypeVar("L")
- list MIDI_EXTENSIONS = [".midi", ".mid"]
- propagate

Index