



AAYUSH SHAH · 12M AGO · 14 VIEWS · PRIVATE



Karaoke-Generator

Python · No attached data sources

Notebook Data Logs Comments (0) Settings

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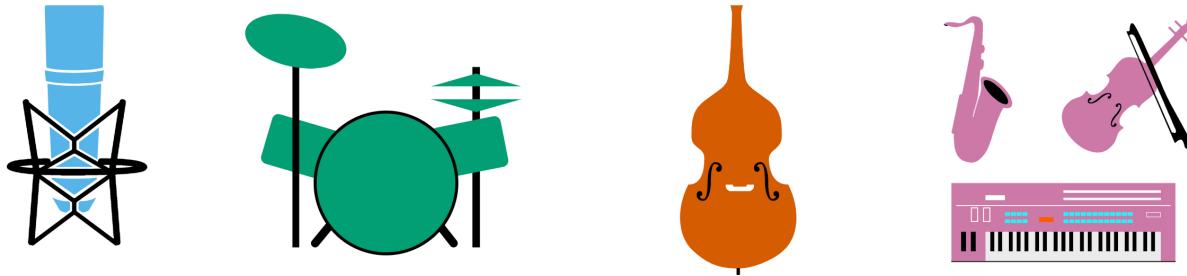
475.3s

Version 7 of 7

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Karaoke Generator

Open-Unmix PyTorch



Open-Unmix is a deep neural network reference implementation for music source separation, applicable for researchers, audio engineers and artists. This notebook provides easy access to pre-trained models that allow users to separate pop music into four stems: **vocals**, **drums**, **bass** and the remaining **other** instruments. The models were trained on the [MUSDB18](#) dataset.

The Model

Open-Unmix is based on a three-layer bidirectional deep LSTM. The model learns to predict the magnitude spectrogram of a target, like *vocals*, from the magnitude spectrogram of a mixture input. Internally, the prediction is obtained by applying a mask on the input. The model is optimized in the magnitude domain using mean squared error and the actual separation is done in a post-processing step involving a differentiable multichannel wiener filter. To perform separation into multiple sources, multiple models are trained for each particular target. While this makes the training less comfortable, it allows great flexibility to customize the training data for each target source.

How to proceed

We provide four pre-trained models:

- **umx1 (default)** trained on private stems dataset of compressed stems.
DOI [10.5281/zenodo.5069601](https://doi.org/10.5281/zenodo.5069601)
- **umxhq** trained on [MUSDB18-HQ](#) which comprises the same tracks as in MUSDB18 but un-compressed which yield in a full bandwidth of 22050 Hz.
DOI [10.5281/zenodo.3267291](https://doi.org/10.5281/zenodo.3267291)
- **umx** is trained on the regular [MUSDB18](#) which is bandwidth limited to 16 kHz due to AAC compression. This model should be used for comparison with other (older) methods for evaluation in [SISEC18](#).
- **umxse** speech enhancement model is trained on the 28-speaker version of the [Voicebank+DEMAND corpus](#).
DOI [10.5281/zenodo.3786908](https://doi.org/10.5281/zenodo.3786908)

Colab Limitations

- The disk and RAM is limited in colab. Loading the four separation models `vocals`, `drums`, `bass` and `other` is already using 400 MB of disk and RAM.
- A major step in the separation is the post-processing, controlled by the parameters `niter`. For faster inference (at the expense of separation quality) it is advised to use `niter=0`.
- Another way to prevent colab from crashing is to only perform separation on smaller excerpts. In the following examples we provide a way to set the start and stop duration of the audio being separated. We suggest **not to separate segments of longer than 30s**.

Installation and Imports (RUN THESE CELLS FIRST)

```
In [1]: !pip install musdb  
!pip install youtube-dl  
!pip install openunmix  
!pip install nlpaug  
!pip install pydub  
!pip install google-colab  
  
Collecting musdb  
  Downloading musdb-0.4.0-py2.py3-none-any.whl (29 kB)  
Requirement already satisfied: tqdm in /opt/conda/lib/python3.7/site-packages (from musdb) (4.63.0)  
Collecting stempeg>=0.2.3  
  Downloading stempeg-0.2.3-py3-none-any.whl (963 kB)  
   ━━━━━━━━━━━━━━━━ 963.5/963.5 KB 2.8 MB/s eta 0:00:00  
Requirement already satisfied: numpy>=1.7 in /opt/conda/lib/python3.7/site-packages (from musdb) (1.21.6)  
Requirement already satisfied: yaml in /opt/conda/lib/python3.7/site-packages (from musdb) (21.10.1)  
Collecting ffmpeg-python>=0.2.0  
  Downloading ffmpeg_python-0.2.0-py3-none-any.whl (25 kB)  
Requirement already satisfied: PyYAML in /opt/conda/lib/python3.7/site-packages (from pyyaml->musdb) (6.0)  
Requirement already satisfied: future in /opt/conda/lib/python3.7/site-packages (from ffmpeg-python>=0.2.0->stempeg>=0.2.3->musdb) (0.18.2)  
Installing collected packages: ffmpeg-python, stempeg, musdb  
Successfully installed ffmpeg-python-0.2.0 musdb-0.4.0 stempeg-0.2.3  
WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It is recommended to use a virtual environment instead: https://pip.pypa.io/warnings/venv  
Collecting youtube-dl  
  Downloading youtube_dl-2021.12.17-py2.py3-none-any.whl (1.9 MB)  
   ━━━━━━━━━━━━━━ 1.9/1.9 MB 4.1 MB/s eta 0:00:00  
Installing collected packages: youtube-dl  
Successfully installed youtube-dl-2021.12.17  
WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It is recommended to use a virtual environment instead: https://pip.pypa.io/warnings/venv  
Collecting openunmix  
  Downloading openunmix-1.2.1-py3-none-any.whl (46 kB)  
   ━━━━━━━━━━━━━━ 46.7/46.7 KB 421.3 kB/s eta 0:00:00  
Requirement already satisfied: numpy in /opt/conda/lib/python3.7/site-packages (from openunmix) (1.21.6)  
Requirement already satisfied: tqdm in /opt/conda/lib/python3.7/site-packages (from openunmix) (4.63.0)  
Requirement already satisfied: torchaudio>=0.9.0 in /opt/conda/lib/python3.7/site-packages (from openunmix) (0.9.1)  
Requirement already satisfied: torch>=1.9.0 in /opt/conda/lib/python3.7/site-packages (from openunmix) (1.9.1+cpu)  
Requirement already satisfied: typing-extensions in /opt/conda/lib/python3.7/site-packages (from torch>=1.9.0->openunmix) (4.2.0)  
Installing collected packages: openunmix  
Successfully installed openunmix-1.2.1  
WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It is recommended to use a virtual environment instead: https://pip.pypa.io/warnings/venv  
Collecting nlpaug  
  Downloading nlpaug-1.1.10-py3-none-any.whl (410 kB)  
   ━━━━━━━━━━━━━━ 410.8/410.8 KB 1.4 MB/s eta 0:00:00  
Requirement already satisfied: requests>=2.22.0 in /opt/conda/lib/python3.7/site-packages (from nlpaug) (2.27.1)  
Requirement already satisfied: pandas>=1.2.0 in /opt/conda/lib/python3.7/site-packages (from nlpaug) (1.3.5)  
Requirement already satisfied: numpy>=1.16.2 in /opt/conda/lib/python3.7/site-packages (from nlpaug) (1.21.6)  
Requirement already satisfied: python-dateutil>=2.7.3 in /opt/conda/lib/python3.7/site-packages (from pandas>=1.2.0->nlpaug) (2.8.2)  
Requirement already satisfied: pytz>=2017.3 in /opt/conda/lib/python3.7/site-packages (from pandas>=1.2.0->nlpaug) (2021.3)  
Requirement already satisfied: certifi>=2017.4.17 in /opt/conda/lib/python3.7/site-packages (from requests>=2.22.0->nlpaug) (2021.10.8)  
Requirement already satisfied: charset-normalizer~=2.0.0 in /opt/conda/lib/python3.7/site-packages (from requests>=2.22.0->nlpaug) (2.0.12)
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Requirement already satisfied: urllib3<1.27,>=1.21.1 in /opt/conda/lib/python3.7/site-packages (from requests>=2.22.0->nlpAug) (1.26.8)
Requirement already satisfied: idna<4,>=2.5 in /opt/conda/lib/python3.7/site-packages (from requests>=2.22.0->nlpAug) (3.3)
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.7/site-packages (from python-dateutil>=2.7.3->pandas>=1.2.0->nlpAug) (1.16.0)
Installing collected packages: nlpAug
Successfully installed nlpAug-1.1.10
WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It is recommended to use a virtual environment instead: https://pip.pypa.io/warnings/venv
Requirement already satisfied: pydub in /opt/conda/lib/python3.7/site-packages (0.25.1)
WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It is recommended to use a virtual environment instead: https://pip.pypa.io/warnings/venv
Collecting google-colab
  Downloading google-colab-1.0.0.tar.gz (72 kB)
   ━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 72.9/72.9 KB 483.3 KB/s eta 0:00:00
    Preparing metadata (setup.py) ... - done
Collecting google-auth~=1.4.0
  Downloading google_auth-1.4.2-py2.py3-none-any.whl (64 kB)
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Collecting ipykernel~=4.6.0
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  Downloading ipython-5.5.0-py3-none-any.whl (758 kB)
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Collecting notebook~=5.2.0
  Downloading notebook-5.2.2-py2.py3-none-any.whl (8.0 MB)
   ━━━━━━━━━━━━ 8.0/8.0 MB 19.7 MB/s eta 0:00:00
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Collecting pandas~=0.24.0
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   ━━━━━━━━━━━━ 10.1/10.1 MB 24.9 MB/s eta 0:00:00
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Collecting requests~=2.21.0
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Requirement already satisfied: rsa>=3.1.4 in /opt/conda/lib/python3.7/site-packages (from google-auth~=1.4.0->google-colab) (4.8)
Requirement already satisfied: traitlets>=4.1.0 in /opt/conda/lib/python3.7/site-packages (from ipykernel~=4.6.0->google-colab) (5.1.1)
Requirement already satisfied: jupyter-client in /opt/conda/lib/python3.7/site-packages (from ipykernel~=4.6.0->google-colab) (7.1.2)
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Requirement already satisfied: pygments in /opt/conda/lib/python3.7/site-packages (from ipython~=5.5.0->google-colab) (2.1.2)
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Collecting prompt-toolkit<2.0.0,>=1.0.4
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Requirement already satisfied: setuptools>=18.5 in /opt/conda/lib/python3.7/site-packages (from ipython~=5.5.0->google-colab) (59.8.0)
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Requirement already satisfied: nbconvert in /opt/conda/lib/python3.7/site-packages (from notebook~=5.2.0->google-colab) (6.5.0)
Requirement already satisfied: jinja2 in /opt/conda/lib/python3.7/site-packages (from notebook~=5.2.0->google-colab) (3.1.
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1)
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  Downloading chardet-3.0.4-py2.py3-none-any.whl (133 kB)
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Requirement already satisfied: wccwidth in /opt/conda/lib/python3.7/site-packages (from prompt-toolkit<2.0.0,>=1.0.4->ipython~=5.5.0->google-colab) (0.2.5)
Requirement already satisfied: pyasn1<0.5.0,>=0.4.6 in /opt/conda/lib/python3.7/site-packages (from pyasn1-modules>=0.2.1->google-auth~=1.4.0->google-colab) (0.4.8)
Requirement already satisfied: ptyprocess in /opt/conda/lib/python3.7/site-packages (from terminado>=0.3.3->notebook~=5.2.0->google-colab) (0.7.0)
Requirement already satisfied: MarkupSafe>=2.0 in /opt/conda/lib/python3.7/site-packages (from jinja2->notebook~=5.2.0->google-colab) (2.0.1)
Requirement already satisfied: nest-asyncio>=1.5 in /opt/conda/lib/python3.7/site-packages (from jupyter-client->ipykernel~=4.6.0->google-colab) (1.5.4)
Requirement already satisfied: entrypoints in /opt/conda/lib/python3.7/site-packages (from jupyter-client->ipykernel~=4.6.0->google-colab) (0.4)
Requirement already satisfied: pyzmq>=13 in /opt/conda/lib/python3.7/site-packages (from jupyter-client->ipykernel~=4.6.0->google-colab) (22.3.0)
Requirement already satisfied: mistune<2,>=0.8.1 in /opt/conda/lib/python3.7/site-packages (from nbconvert->notebook~=5.2.0->google-colab) (0.8.4)
Requirement already satisfied: beautifulsoup in /opt/conda/lib/python3.7/site-packages (from nbconvert->notebook~=5.2.0->google-colab) (4.10.0)
Requirement already satisfied: jupyterlab-pygments in /opt/conda/lib/python3.7/site-packages (from nbconvert->notebook~=5.2.0->google-colab) (0.1.2)
Requirement already satisfied: defusedxml in /opt/conda/lib/python3.7/site-packages (from nbconvert->notebook~=5.2.0->google-colab) (0.7.1)
Requirement already satisfied: nbclient>=0.5.0 in /opt/conda/lib/python3.7/site-packages (from nbconvert->notebook~=5.2.0->google-colab) (0.5.13)
Requirement already satisfied: packaging in /opt/conda/lib/python3.7/site-packages (from nbconvert->notebook~=5.2.0->google-colab) (21.3)
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Requirement already satisfied: tinycss2 in /opt/conda/lib/python3.7/site-packages (from nbconvert->notebook~=5.2.0->google-colab) (1.1.1)
Requirement already satisfied: bleach in /opt/conda/lib/python3.7/site-packages (from nbconvert->notebook~=5.2.0->google-colab) (4.1.0)
Requirement already satisfied: jsonschema!=2.5.0,>=2.4 in /opt/conda/lib/python3.7/site-packages (from nbformat->notebook~=5.2.0->google-colab) (4.4.0)
Requirement already satisfied: attrs>=17.4.0 in /opt/conda/lib/python3.7/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat->notebook~=5.2.0->google-colab) (21.4.0)
Requirement already satisfied: importlib-resources>=1.4.0 in /opt/conda/lib/python3.7/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat->notebook~=5.2.0->google-colab) (5.4.0)
Requirement already satisfied: importlib-metadata in /opt/conda/lib/python3.7/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat->notebook~=5.2.0->google-colab) (4.11.3)
Requirement already satisfied: typing-extensions in /opt/conda/lib/python3.7/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat->notebook~=5.2.0->google-colab) (4.2.0)
Requirement already satisfied: pyrsistent!=0.17.0,!0.17.1,!0.17.2,>=0.14.0 in /opt/conda/lib/python3.7/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat->notebook~=5.2.0->google-colab) (0.18.1)
Requirement already satisfied: soupsieve>1.2 in /opt/conda/lib/python3.7/site-packages (from beautifulsoup4->nbconvert->notebook~=5.2.0->google-colab) (2.3.1)
Requirement already satisfied: webencodings in /opt/conda/lib/python3.7/site-packages (from bleach->nbconvert->notebook~=5.2.0->google-colab) (0.5.1)
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Requirement already satisfied: webencodings in /opt/conda/lib/python3.7/site-packages (from nbconvert->nbconvert-notebook~=5.2.0->google-colab) (0.5.1)
Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in /opt/conda/lib/python3.7/site-packages (from packaging->nbconvert->notebook~=5.2.0->google-colab) (3.0.7)
Requirement already satisfied: zipp>=3.1.0 in /opt/conda/lib/python3.7/site-packages (from importlib-resources>=1.4.0->jsonschema!=2.5.0,>=2.4->nbformat->notebook~=5.2.0->google-colab) (3.7.0)
Building wheels for collected packages: google-colab, portpicker, tornado, simplegeneric
  Building wheel for google-colab (setup.py) ... - \ | done
    Created wheel for google-colab: filename=google_colab-1.0.0-py2.py3-none-any.whl size=102292 sha256=38b30836ad556d594d5c3c6b6b83391c6b177dd379ecc689a3cb73fa09bccf59
      Stored in directory: /root/.cache/pip/wheels/f6/3b/58/f34ea9045a7c69bd5634978bf25ac60277e90997d9e6e74192
    Building wheel for portpicker (setup.py) ... - \ | done
    Created wheel for portpicker: filename=portpicker-1.2.0-py3-none-any.whl size=13384 sha256=ebd223900c61ead2710a682f5a73190dcba421b4be6de0af569b702ffb4554f
      Stored in directory: /root/.cache/pip/wheels/73/0c/f5/35977446e45e818e6b848be3d41e7f38298a5102f4dcda21c6
    Building wheel for tornado (setup.py) ... - \ | / done
    Created wheel for tornado: filename=tornado-4.5.3-cp37-cp37m-linux_x86_64.whl size=434358 sha256=b3a7d27396b1ebad802836cc0be16ec35a1bfa5eca4cfcdc909207aaece6a3657
      Stored in directory: /root/.cache/pip/wheels/a2/45/43/36ec7a893e16c1212a6b1505ded0a2d73cf8e863a0227c8e04
    Building wheel for simplegeneric (setup.py) ... - done
    Created wheel for simplegeneric: filename=simplegeneric-0.8.1-py3-none-any.whl size=5078 sha256=a1435cd3370cf25ff1235c456ec22a0da5b89351dd1899523f879e57419b6e66
Requirement already satisfied: webencodings in /opt/conda/lib/python3.7/site-packages (from bleach->nbconvert->notebook~=5.2.0->google-colab) (0.5.1)
Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in /opt/conda/lib/python3.7/site-packages (from packaging->nbconvert->notebook~=5.2.0->google-colab) (3.0.7)
Requirement already satisfied: zipp>=3.1.0 in /opt/conda/lib/python3.7/site-packages (from importlib-resources>=1.4.0->jsonschema!=2.5.0,>=2.4->nbformat->notebook~=5.2.0->google-colab) (3.7.0)
Building wheels for collected packages: google-colab, portpicker, tornado, simplegeneric
  Building wheel for google-colab (setup.py) ... - \ | done
    Created wheel for google-colab: filename=google_colab-1.0.0-py2.py3-none-any.whl size=102292 sha256=38b30836ad556d594d5c3c6b6b83391c6b177dd379ecc689a3cb73fa09bccf59
      Stored in directory: /root/.cache/pip/wheels/f6/3b/58/f34ea9045a7c69bd5634978bf25ac60277e90997d9e6e74192
    Building wheel for portpicker (setup.py) ... - \ | done
    Created wheel for portpicker: filename=portpicker-1.2.0-py3-none-any.whl size=13384 sha256=ebd223900c61ead2710a682f5a73190dcba421b4be6de0af569b702ffb4554f
      Stored in directory: /root/.cache/pip/wheels/73/0c/f5/35977446e45e818e6b848be3d41e7f38298a5102f4dcda21c6
    Building wheel for tornado (setup.py) ... - \ | / done
    Created wheel for tornado: filename=tornado-4.5.3-cp37-cp37m-linux_x86_64.whl size=434358 sha256=b3a7d27396b1ebad802836cc0be16ec35a1bfa5eca4cfcdc909207aaece6a3657
      Stored in directory: /root/.cache/pip/wheels/a2/45/43/36ec7a893e16c1212a6b1505ded0a2d73cf8e863a0227c8e04
    Building wheel for simplegeneric (setup.py) ... - done
    Created wheel for simplegeneric: filename=simplegeneric-0.8.1-py3-none-any.whl size=5078 sha256=a1435cd3370cf25ff1235c456ec22a0da5b89351dd1899523f879e57419b6e66
      Stored in directory: /root/.cache/pip/wheels/90/de/df/f1324f4dd966636ab877b82d467aca38a0998b1c42ddb7288
  Successfully built google-colab portpicker tornado simplegeneric
Installing collected packages: tornado, simplegeneric, portpicker, chardet, urllib3, six, idna, requests, prompt-toolkit, google-auth, pandas, ipython, ipykernel, notebook, google-colab
Attempting uninstall: tornado
  Found existing installation: tornado 6.1
  Uninstalling tornado-6.1:
    Successfully uninstalled tornado-6.1
Attempting uninstall: chardet
  Found existing installation: chardet 4.0.0
  Uninstalling chardet-4.0.0:
    Successfully uninstalled chardet-4.0.0
Attempting uninstall: urllib3
  Found existing installation: urllib3 1.26.8
  Uninstalling urllib3-1.26.8:
    Successfully uninstalled urllib3-1.26.8
Attempting uninstall: six
  Found existing installation: six 1.16.0
  Uninstalling six-1.16.0:
    Successfully uninstalled six-1.16.0
Attempting uninstall: idna
  Found existing installation: idna 3.3
```

```
Uninstalling idna-3.3:
  Successfully uninstalled idna-3.3
Attempting uninstall: requests
  Found existing installation: requests 2.27.1
Uninstalling requests-2.27.1:
  Successfully uninstalled requests-2.27.1
Attempting uninstall: prompt-toolkit
  Found existing installation: prompt-toolkit 3.0.27
Uninstalling prompt-toolkit-3.0.27:
  Successfully uninstalled prompt-toolkit-3.0.27
Attempting uninstall: google-auth
  Found existing installation: google-auth 1.35.0
Uninstalling google-auth-1.35.0:
  Successfully uninstalled google-auth-1.35.0
Attempting uninstall: pandas
  Found existing installation: pandas 1.3.5
Uninstalling pandas-1.3.5:
  Successfully uninstalled pandas-1.3.5
Attempting uninstall: ipython
  Found existing installation: ipython 7.32.0
Uninstalling ipython-7.32.0:
  Successfully uninstalled ipython-7.32.0
Attempting uninstall: ipykernel
  Found existing installation: ipykernel 6.9.2
Uninstalling ipykernel-6.9.2:
  Successfully uninstalled ipykernel-6.9.2
Attempting uninstall: notebook
  Found existing installation: notebook 6.4.10
Uninstalling notebook-6.4.10:
  Successfully uninstalled notebook-6.4.10
ERROR: pip's dependency resolver does not currently take into account all the packages
that are installed. This behaviour is the source of the following dependency conflict
s.
tensorflow-io 0.21.0 requires tensorflow-io-gcs-filesystem==0.21.0, which is not insta
lled.
beatrix-jupyterlab 3.1.7 requires google-cloud-bigquery-storage, which is not installe
d.
xarray 0.20.2 requires pandas>=1.1, but you have pandas 0.24.2 which is incompatible.
woodwork 0.16.2 requires pandas<1.4.2,>=1.3.0, but you have pandas 0.24.2 which is inc
ompatible.
wandb 0.12.15 requires six>=1.13.0, but you have six 1.12.0 which is incompatible.
visions 0.7.4 requires pandas>=0.25.3, but you have pandas 0.24.2 which is incompatibl
e.
tsfresh 0.19.0 requires pandas>=0.25.0, but you have pandas 0.24.2 which is incompatib
le.
tfx-bsl 1.7.0 requires pandas<2,>=1.0, but you have pandas 0.24.2 which is incompatibl
e.
tfx-bsl 1.7.0 requires pyarrow<6,>=1, but you have pyarrow 7.0.0 which is incompatibl
e.
tfx-bsl 1.7.0 requires tensorflow!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2
.6.*,!=2.7.*,<3,>=1.15.5, but you have tensorflow 2.6.3 which is incompatible.
tensorflow 2.6.3 requires absl-py~0.10, but you have absl-py 1.0.0 which is incompati
ble.
tensorflow 2.6.3 requires numpy~>=1.19.2, but you have numpy 1.21.6 which is incompatib
le.
tensorflow 2.6.3 requires six~>=1.15.0, but you have six 1.12.0 which is incompatible.
tensorflow 2.6.3 requires typing-extensions<3.11,>=3.7, but you have typing-extensions
4.2.0 which is incompatible.
tensorflow 2.6.3 requires wrapt~>=1.12.1, but you have wrapt 1.14.0 which is incompatib
le.
tensorflow-transform 1.7.0 requires pyarrow<6,>=1, but you have pyarrow 7.0.0 which is
incompatible.
tensorflow-transform 1.7.0 requires tensorflow!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.
*,!=2.5.*,!=2.6.*,!=2.7.*,<2.9,>=1.15.5, but you have tensorflow 2.6.3 which is incomp
atible.
tensorflow-serving-api 2.8.0 requires tensorflow<3,>=2.8.0, but you have tensorflow 2.
6.3 which is incompatible.
tensorboard 2.6.0 requires google-auth<2,>=1.6.3, but you have google-auth 1.4.2 which
is incompatible.
statsmodels 0.13.2 requires pandas>=0.25, but you have pandas 0.24.2 which is incompat
ible.
spopt 0.3.0 requires pandas>=1, but you have pandas 0.24.2 which is incompatible.
```

spaghetti 1.6.5 requires pandas>=1.0, but you have pandas 0.24.2 which is incompatible.

spacy 3.2.4 requires typing-extensions<4.0.0.0,>=3.7.4; python_version < "3.8", but you have typing-extensions 4.2.0 which is incompatible.

sklearn-pandas 2.2.0 requires pandas>=1.1.4, but you have pandas 0.24.2 which is incompatible.

pyarabic 0.6.14 requires six>=1.14.0, but you have six 1.12.0 which is incompatible.

plotnine 0.8.0 requires pandas>=1.1.0, but you have pandas 0.24.2 which is incompatible.

phik 0.12.0 requires pandas>=0.25.1, but you have pandas 0.24.2 which is incompatible.

pdpbox 0.2.1 requires matplotlib==3.1.1, but you have matplotlib 3.5.1 which is incompatible.

pandas-profiling 3.1.0 requires pandas!=1.0.0,!1.0.1,!1.0.2,!1.1.0,>=0.25.3, but you have pandas 0.24.2 which is incompatible.

pandas-profiling 3.1.0 requires requests>=2.24.0, but you have requests 2.21.0 which is incompatible.

pandarallel 1.6.1 requires pandas>=1, but you have pandas 0.24.2 which is incompatible.

osmnx 1.1.1 requires pandas>=1.1, but you have pandas 0.24.2 which is incompatible.

osmnx 1.1.1 requires requests>=2.25, but you have requests 2.21.0 which is incompatible.

nlpauge 1.1.10 requires pandas>=1.2.0, but you have pandas 0.24.2 which is incompatible.

nlpauge 1.1.10 requires requests>=2.22.0, but you have requests 2.21.0 which is incompatible.

nilearn 0.9.1 requires pandas>=1.0, but you have pandas 0.24.2 which is incompatible.

mizani 0.7.3 requires pandas>=1.1.0, but you have pandas 0.24.2 which is incompatible.

mapclassify 2.4.3 requires pandas>=1.0, but you have pandas 0.24.2 which is incompatible.

kaggle-environments 1.9.9 requires requests>=2.25.1, but you have requests 2.21.0 which is incompatible.

jupyterlab 3.2.9 requires tornado>=6.1.0, but you have tornado 4.5.3 which is incompatible.

jupyter-server 1.15.4 requires tornado>=6.1.0, but you have tornado 4.5.3 which is incompatible.

jupyter-console 6.4.3 requires prompt-toolkit!=3.0.0,!3.0.1,<3.1.0,>=2.0.0, but you have prompt-toolkit 1.0.18 which is incompatible.

ipympl 0.7.0 requires ipykernel>=4.7, but you have ipykernel 4.6.1 which is incompatible.

ibis-framework 2.1.1 requires pandas<2,>=1.2.5, but you have pandas 0.24.2 which is incompatible.

grpcio-status 1.44.0 requires grpcio>=1.44.0, but you have grpcio 1.43.0 which is incompatible.

google-cloud-storage 2.1.0 requires google-auth<3.0dev,>=1.25.0, but you have google-auth 1.4.2 which is incompatible.

google-cloud-core 1.7.2 requires google-auth<2.0dev,>=1.24.0, but you have google-auth 1.4.2 which is incompatible.

google-cloud-bigquery 2.2.0 requires six<2.0.0dev,>=1.13.0, but you have six 1.12.0 which is incompatible.

google-cloud-aiplatform 0.6.0a1 requires google-cloud-storage<2.0.0dev,>=1.26.0, but you have google-cloud-storage 2.1.0 which is incompatible.

google-api-python-client 1.12.11 requires google-auth<3dev,>=1.16.0; python_version >= "3", but you have google-auth 1.4.2 which is incompatible.

google-api-python-client 1.12.11 requires six<2dev,>=1.13.0, but you have six 1.12.0 which is incompatible.

google-api-core 1.31.5 requires google-auth<2.0dev,>=1.25.0, but you have google-auth 1.4.2 which is incompatible.

google-api-core 1.31.5 requires six>=1.13.0, but you have six 1.12.0 which is incompatible.

geopandas 0.10.2 requires pandas>=0.25.0, but you have pandas 0.24.2 which is incompatible.

gcsfs 2022.2.0 requires fsspec==2022.02.0, but you have fsspec 2022.3.0 which is incompatible.

featuretools 1.8.0 requires pandas>=1.3.0, but you have pandas 0.24.2 which is incompatible.

fbprophet 0.7.1 requires pandas>=1.0.4, but you have pandas 0.24.2 which is incompatible.

explainable-ai-sdk 1.3.3 requires google.auth>=1.14.1, but you have google-auth 1.4.2 which is incompatible.

distributed 2022.2.0 requires tornado>=5; python_version < "3.8", but you have tornado 4.5.3 which is incompatible.

cookiecutter 1.7.3 requires requests>=2.23.0, but you have requests 2.21.0 which is incompatible.

```
compatible.
cloud-tpu-client 0.10 requires google-api-python-client==1.8.0, but you have google-ap
i-python-client 1.12.11 which is incompatible.
bqplot 0.12.33 requires pandas<2.0.0,>=1.0.0, but you have pandas 0.24.2 which is inco
mpatible.
botocore 1.25.0 requires urllib3<1.27,>=1.25.4, but you have urllib3 1.24.3 which is i
ncompatible.
bokeh 2.4.2 requires tornado>=5.1, but you have tornado 4.5.3 which is incompatible.
beatrix-jupyterlab 3.1.7 requires google-auth>=1.22.0, but you have google-auth 1.4.2
which is incompatible.
beatrix-jupyterlab 3.1.7 requires requests>=2.22.0, but you have requests 2.21.0 which
is incompatible.
apache-beam 2.37.0 requires dill<0.3.2,>=0.3.1.1, but you have dill 0.3.4 which is inc
ompatible.
apache-beam 2.37.0 requires httplib2<0.20.0,>=0.8, but you have httplib2 0.20.4 which
is incompatible.
apache-beam 2.37.0 requires pyarrow<7.0.0,>=0.15.1, but you have pyarrow 7.0.0 which i
s incompatible.
apache-beam 2.37.0 requires requests<3.0.0,>=2.24.0, but you have requests 2.21.0 whic
h is incompatible.
aiobotocore 2.2.0 requires botocore<1.24.22,>=1.24.21, but you have botocore 1.25.0 wh
ich is incompatible.

Successfully installed chardet-3.0.4 google-auth-1.4.2 google-colab-1.0.0 idna-2.8 ipy
kernel-4.6.1 ipython-5.5.0 notebook-5.2.2 pandas-0.24.2 portpicker-1.2.0 prompt-toolki
t-1.0.18 requests-2.21.0 simplegeneric-0.8.1 six-1.15.0 tornado-4.5.3 urllib3-1.24.3
WARNING: Running pip as the 'root' user can result in broken permissions and conflicti
ng behaviour with the system package manager. It is recommended to use a virtual envir
onment instead: https://pip.pypa.io/warnings/venv
```

In [2]:

```
import torch
import torchaudio
import numpy as np
import scipy
import youtube_dl
import stempeg
import os
import librosa
from google.colab import files
from IPython.display import Audio, display
import matplotlib.pyplot as plt
import nlpaug.augmenter.audio as nna
from pydub import AudioSegment
import subprocess

use_cuda = torch.cuda.is_available()
device = torch.device("cuda" if use_cuda else "cpu")
```

```
/opt/conda/lib/python3.7/site-packages/IPython/utils/traitlets.py:5: UserWarning: IPyt
hon.utils.traitlets has moved to a top-level traitlets package.
  warn("IPython.utils.traitlets has moved to a top-level traitlets package.")
```

Separate MUSDB18 tracks

Get a musdb18 7 second preview track

In [3]:

```
import musdb
mus = musdb.DB(download=True, subsets='test')

for i in mus:
    print(i)

track = mus[25]
print(track.name)
display(Audio(track.audio.T, rate=track.rate))
```

```
Downloading MUSDB 7s Sample Dataset to /root/MUSDB18/MUSDB18-7...
```

Done!

AM Contra - Heart Peripheral
Al James - Schoolboy Facination
Angels In Amplifiers - I'm Alright
Arise - Run Run Run
BKS - Bulldozer
BKS - Too Much
Ben Carrigan - We'll Talk About It All Tonight
Bobby Nobody - Stitch Up
Buitraker - Revo X
Carlos Gonzalez - A Place For Us
Cristina Vane - So Easy
Detsky Sad - Walkie Talkie
Enda Reilly - Cur An Long Ag Seol
Forkupines - Semantics
Georgia Wonder - Siren
Girls Under Glass - We Feel Alright
Hollow Ground - Ill Fate
James Elder & Mark M Thompson - The English Actor
Juliet's Rescue - Heartbeats
Little Chicago's Finest - My Own
Louis Cressy Band - Good Time
Lyndsey Ollard - Catching Up
M.E.R.C. Music - Knockout
Moosmusic - Big Dummy Shake
Motor Tapes - Shore
Mu - Too Bright
Nerve 9 - Pray For The Rain
PR - Happy Daze
PR - Oh No
Punkdisco - Oral Hygiene
Raft Monk - Tiring
Sambasevam Shanmugam - Kaathaadi
Secretariat - Borderline
Secretariat - Over The Top
Side Effects Project - Sing With Me
Signe Jakobsen - What Have You Done To Me
Skelpolu - Resurrection
Speak Softly - Broken Man
Speak Softly - Like Horses
The Doppler Shift - Atrophy
The Easton Ellises (Baumi) - SDRNR
The Easton Ellises - Falcon 69
The Long Wait - Dark Horses
The Mountaineering Club - Mallory
The Sunshine Garcia Band - For I Am The Moon
Timboz - Pony
Tom McKenzie - Directions
Triviu1l feat. The Fiend - Widow
We Fell From The Sky - Not You
Zeno - Signs
Mu - Too Bright



Apply separation into four stems

open-unmix is auto-downloading a model for each available target:

- vocals
- drums
- bass
- other

In [4]:

```
from openunmix import predict
estimates = predict.separate(
    torch.as_tensor(track.audio).float(),
```

```

        rate=track.rate,
        device=device
    )
    for target, estimate in estimates.items():
        print(target)
        audio = estimate.detach().cpu().numpy()[0]
        display(Audio(audio, rate=track.rate))

```

Downloading: "https://zenodo.org/api/files/f8209c3e-ba60-48cf-8e79-71ae65beca61/vocals-bccbd9aa.pth" to /root/.cache/torch/hub/checkpoints/vocals-bccbd9aa.pth

Downloading: "https://zenodo.org/api/files/f8209c3e-ba60-48cf-8e79-71ae65beca61/drums-69e0ebd4.pth" to /root/.cache/torch/hub/checkpoints/drums-69e0ebd4.pth

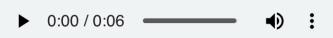
Downloading: "https://zenodo.org/api/files/f8209c3e-ba60-48cf-8e79-71ae65beca61/bass-2ca1ce51.pth" to /root/.cache/torch/hub/checkpoints/bass-2ca1ce51.pth

Downloading: "https://zenodo.org/api/files/f8209c3e-ba60-48cf-8e79-71ae65beca61/other-c8c5b3e6.pth" to /root/.cache/torch/hub/checkpoints/other-c8c5b3e6.pth

vocals



drums



bass



other



Apply separation into vocals/accompaniment

Even open-unmix does not provide a separate model for the accompaniment, we can use the spectral residual model in the post-processing to force a linear sum of all separated sources - e.g. this can be used for vocal/accompaniment separation. Note, that the separation performance is decreased when using the residual model.

In [5]:

```

estimates = predict.separate(
    torch.as_tensor(track.audio).float(),
    rate=track.rate,
    targets=['vocals'],
    residual=True,
    device=device,
)
for target, estimate in estimates.items():

```

```
    print(target)
    display(Audio(estimate.detach().cpu().numpy()[0], rate=track.rate))
```

vocals



residual



Another way to achieve vocal/accompaniment separation is to separate into four stems and sum up the non-vocal stems.

```
In [6]: estimates = predict.separate(
    audio=torch.as_tensor(track.audio).float(),
    rate=track.rate,
    targets=['vocals', 'drums', 'bass', 'other'],
    residual=True,
    device=device
)
print('vocals')
display(Audio(estimates['vocals'].detach().cpu().numpy()[0], rate=track.rate))
acc = np.sum(
    [audio.detach().cpu().numpy()[0] for target, audio in estimates.items() if not target
 =='vocals'],
    axis=0
)
print('accompaniment')
display(Audio(acc, rate=track.rate))
```

vocals



accompaniment



Separate Youtube Video

```
In [7]: from IPython.display import HTML
url = "W8a4sUabCUo" #@param {type:"string"}
start = 60 #@param {type:"number"}
stop = 90 #@param {type:"number"}
embed_url = "https://www.youtube.com/embed/%s?start=%d&end=%d" %(url,start,stop)
# embed_url = "https://www.youtube.com/embed/%s?rel=0&start=%d&end=%d" % (url, start, stop)
HTML('<iframe width="550" height="315" src=' + embed_url + ' frameborder="0" allowfullscreen></iframe>')
```

```
/opt/conda/lib/python3.7/site-packages/IPython/core/display.py:724: UserWarning: Consider using IPython.display.IFrame instead
# fallback on the input, trust the user
```