Wave-U-Net

A Multi-Scale Neural Network for End-to-End Audio Source Separation

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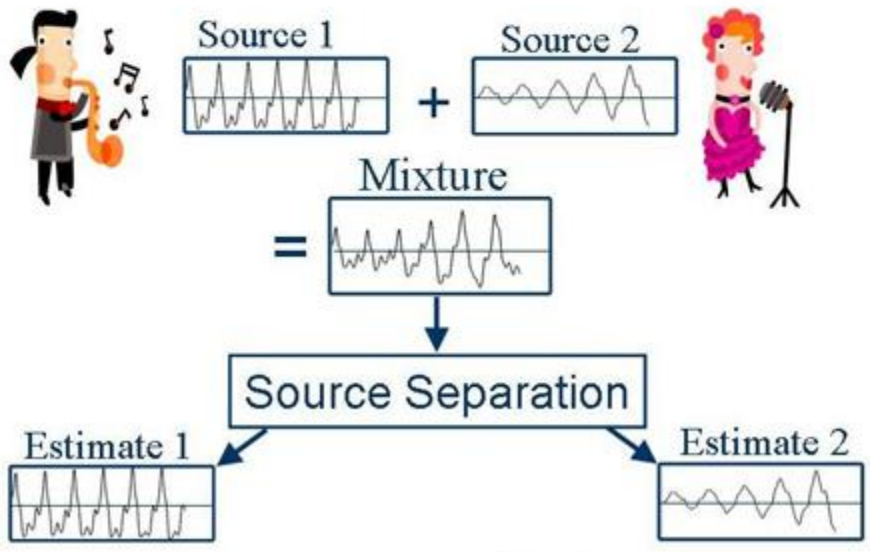
Motivation

Task: Audio source separation

Example: Singing voice separation

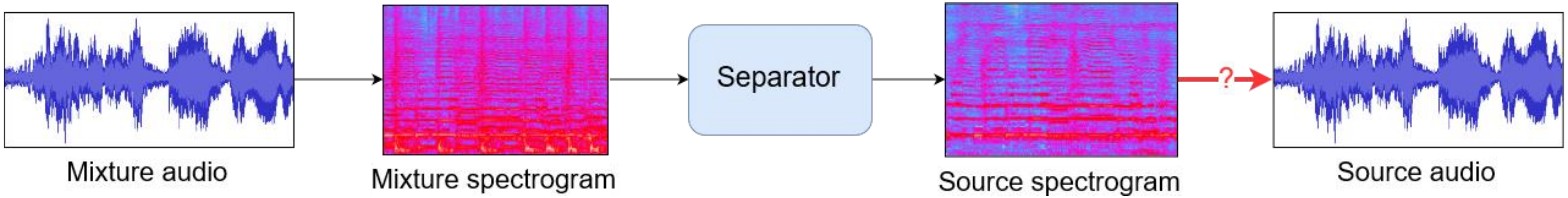
- Karaoke
- Lyrics transcription
- Many more…



Previous work

Mostly spectrogram-based [1,2,3]

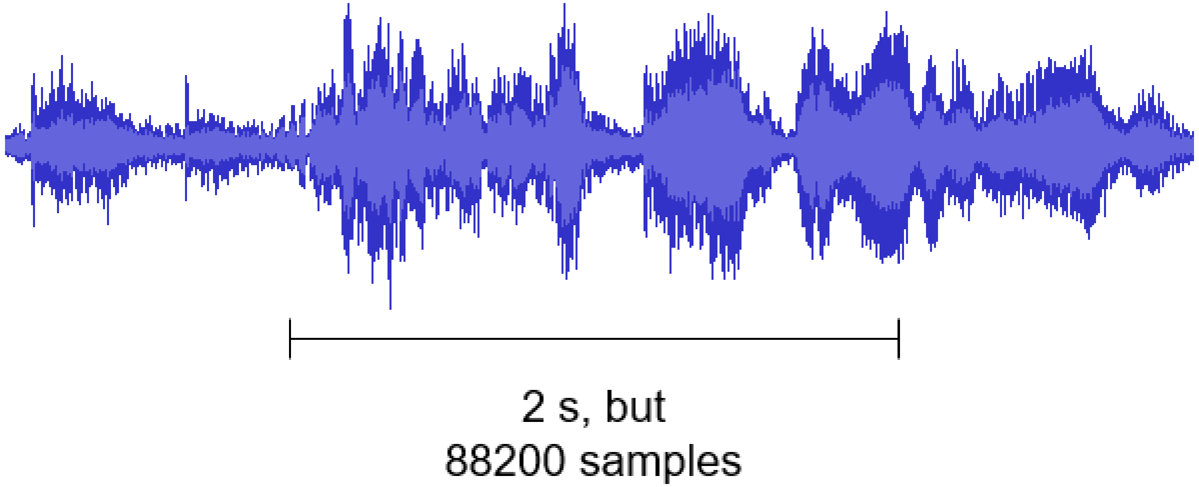
- Problem: Reconstruct source signal from its spectrogram estimates
- Result: Output artifacts



Previous work

Recently: Few time-domain approaches [4,5]

- Problem: Model long-term dependencies in raw audio
- Result: Context-deprived [4] or slow [5] models



Our solution: Wave-U-Net

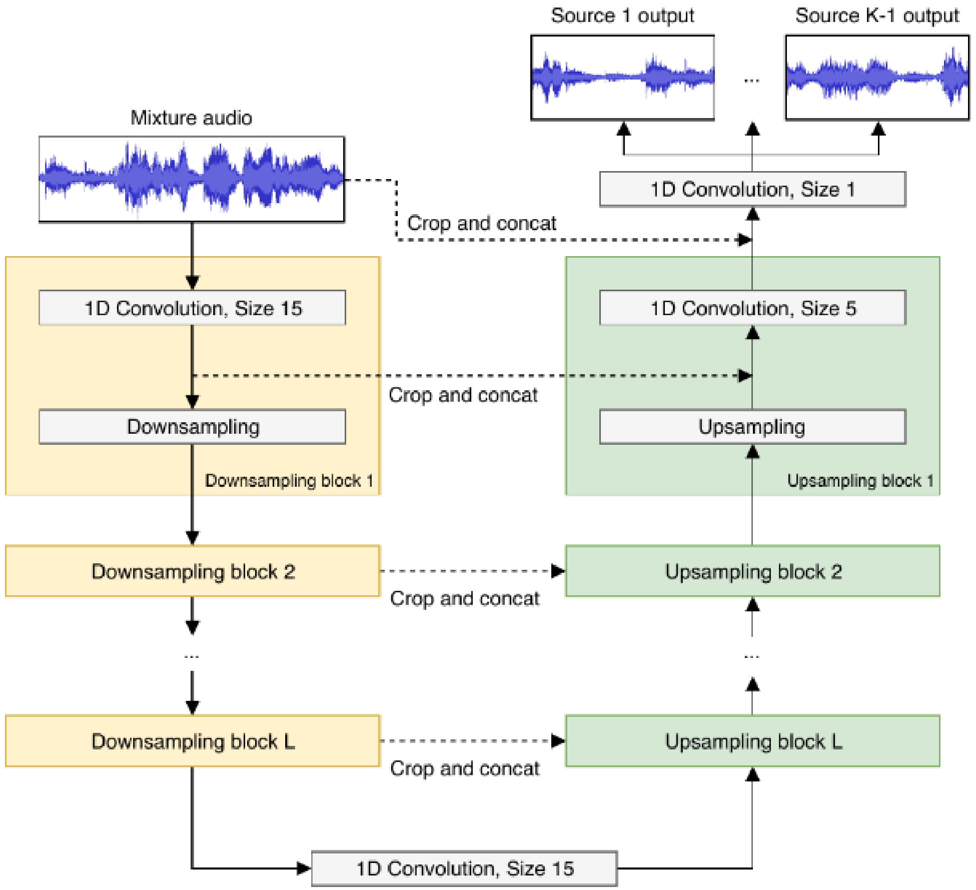
Adaptation of U-Net [1,6] to raw audio

Core idea: Feature hierarchy

- Features at different timescales
- Efficient long-term dependency modelling

Simple system

- No pre-/postprocessing
- Convolutions and resampling



Results

Encouraging performance in SiSec challenge

Extra audio context improves performance

Code and audio examples:

https://github.com/f90/Wave-U-Net

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