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

Diart: A Python Library for Real-Time Speaker Diarization

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Summary

The term “speaker diarization” denotes the problem of determining “who speaks when” in a recorded conversation. Among other reasons, it has attracted the attention of the speech research community because of its ability to improve transcription performance, readability and exploitability. Speaker diarization in real-time holds the potential to accelerate and cement the adoption of this technology in our everyday lives. However, although “offline” systems today achieve outstanding performance in pre-recorded conversations, additional problems of “online” real-time diarization, like limited context and low latency, require flexible and efficient solutions enabling both research and production-ready applications. We introduce a Python package called `Diart` to address real-time speaker diarization in an efficient and flexible way.

Statement of need

`Diart` is a Python library for real-time speaker diarization. It leverages data structures and pre-trained models available in `pyannote.audio` (Bredin et al., 2020) to implement production-ready real-time inference on a variety of audio streams like local and remote audio/video files, microphones, and even WebSockets. Moreover, `Diart` was designed to facilitate research by providing fast batched inference and hyper-parameter tuning thanks to and in full compatibility with `Optuna` (Akiba et al., 2019).

`Diart` was designed with an object-oriented API fully capable of extension and customization. Streaming is powered internally by `ReactiveX` extensions, but available “blocks” allow users to mix and match different operations with any streaming library they choose. A prototyping tool with a CLI is also provided to quickly evaluate, profile, visualize and optimize custom systems.

`Diart` is based on previous research on low-latency online speaker diarization (Coria et al., 2021) and allows to reproduce its results. It has also participated in the recent Ego4D Audio-only Diarization Challenge (Grauman et al., 2022), outperforming the offline baseline by a large margin. We hope `Diart`’s flexibility, efficiency and customization will allow for exciting new research and applications in online speaker diarization.

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