A BENCHMARK OF STATE-OF-THE-ART SOUND EVENT DETECTION SYSTEMS EVALUATED ON SYNTHETIC SOUNDSCAPES

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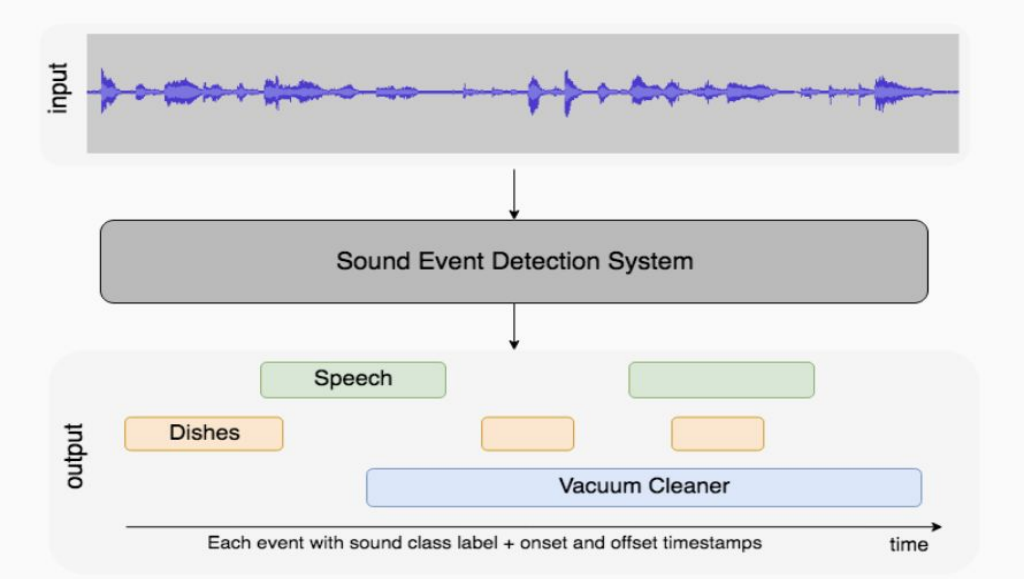
SOUND EVENT DETECTION



DCASE CHALLENGE TASK 4

HETEROGENEOUS DATASET

2018 → **2019** → **2021**

WEAK LABELS AND UNLABELED DATA (DESED DATASET)

ADDING **STRONGLY LABELED SYNTHETIC DATA** TO DESED DATASET

INCLUDING **NON-TARGET EVENTS** IN STRONGLY LABELED SYNTHETIC DATA TO DESED DATASET

STRONGLY LABELED SYNTHETIC SOUNDSCAPES

👎 Domain mismatch

👍 Cheap to obtain

👍 Less prone to subjectivity for onsets and offsets localization

👍 **Full control over the properties of the soundscapes**

STRONGLY LABELED SYNTHETIC SOUNDSCAPES

Generate **customized soundscapes** to untangle some of the many problems faced by a SED system operating under real conditions.

GOAL OF THE STUDY

Benchmark DCASE 2021 Challenge Task 4 submissions.

- Robustness of the systems to varying levels of target to non-target signal-to-noise ratio (TNTSNR).
- Robustness of the systems to varying time localization of target sound events.
- Analysis the impact of non-target sound events on the systems.

TASK SETUP

Evaluation metrics: polyphonic sound detection score (**PSDS**).

- More robust in labeling subjectivity.
- Focus on specific application scenarios.

TASK SETUP

Scenario 1 (**PSDS_1**)

The system needs to react fast upon an event detection.

Scenario 2 (**PSDS_2**)

The system must avoid confusion between classes but the reaction time is less crucial than in the first scenario.

TAKE HOME - KEY POINTS

- Systems that are tailored for a **fine time segmentation** are generally **more robust to the event localization** within the clips.

- **Fine time segmentation systems** can also be **more sensitive to false alarm** triggered by non-target events.

- Systems that are tailored for **coarse time segmentation** generally provide an event classification that is **more robust to low TNTSNR.**

THANK YOU!

WHAT TO KNOW MORE ABOUT THE STUDY?
DON'T HESITATE TO COME DISCUSS WITH US IN THE
POSTER SESSION!