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AFxResearch: a repository and website of audio effects research

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***Abstract*— We present *AFxResearch*[1], a repository and associated website[2] gathering scientific literature about audio effects. Our database includes topics like: modeling, classification, estimation, removal, style transfer, processing and review papers. Our website contains a detailed table of publications, with search, filter and sort features, while the repository enables users to submit requests for new entries or revise existing ones.**

I. REPOSITORY AND WEBSITE

Research on audio effects has significantly expanded over the last few decades [1], driven by advances in digital signal processing [2], machine learning [3], and auditory perception. As the body of literature on audio effects grows, the need for a centralized repository with tools for easy access and exploration becomes essential. *AFxResearch* addresses this by providing a comprehensive and flexible database of publications, serving as a go-to resource for researchers, educators, and practitioners. *AFxResearch* is hosted on a user-friendly website that facilitates exploration through search, filter, and sort functionalities. It also supports community-driven updates, allowing users to submit new publications or suggest modifications, ensuring the database remains current and reflects the evolving field of audio effects research.

II. DATABASE

Metadata — The database offers detailed metadata for each publication, allowing users to assess its relevance before accessing the full text. At the moment of publication, the metadata includes: title, author(s), paper URL, publication date, main task, paradigm(s), device(s) type(s), device(s) model, method(s), webpage URL, code URL, dataset URL, abstract.

Tasks — Publications are categorized based on the primary task they address, included and not limited to:

- Classification/Identification - studies that classify different types of audio effects (e.g., distortion, phaser, reverb) or identify specific devices (e.g., ProCo Rat distortion, Teletronix LA2A compressor) from audio signals [4].
- Estimation/Regression - works concerned with estimating the controls settings (e.g., gain, cutoff frequency, modulation speed) used to process audio examples or the internal coefficients of processing blocks (e.g., all-pass filter, biquad filter, low-frequency oscillator) [5].
- Modeling - research on developing mathematical or computational models of audio effects [6].
- Removal - research aimed at removing audio effects from processed signals.
- Style Transfer - studies about replicating the sonic characteristics of a reference audio example onto an input example, independent of content, effects, or processing methods used [7].
- Processing - broad category about processing audio signals that includes: automatic audio effects control, automatic mixing, audio processing graph estimation, creative uses of audio effects or derivation of new ones.
- Review - overviews of a specific subtopic or task.

Paradigms — The database includes publications that employ any modeling or emulation paradigms: white-box, gray-box [8], black-box.

Methods — The methods section categorizes publications based on the technical approaches and tools used in the research. Common methods include: differentiable DSP , dynamic convolution, equations solving or approximation, neural networks [3], state-space, wave digital filters, port-hamiltonian, Volterra series, waveshaping, Wiener-Hammerstein.

[1] https://github.com/mcomunita/afx-research
[2] https://mcomunita.github.io/afx-research

III. REFERENCES

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