yammer

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Abstract

yammer is an interactive audio installation and performance environment that questions the ambiguities and limitations inherent in attempts to describe and represent music and other complex human expressive sonic events using commonplace ontologies in audio classification systems and large language models. Live audio produced by visitors to the installation undergoes audio classification using YAMNet, and an immersive soundscape is created by combining the live audio input with playback and processing of members of the AudioSet dataset belonging to the same putative audio event classes, often to humorous and nonsensical ends. Ultimately, yammer entreats those engaging with the installation to question not only the datasets used in audio classification, but also the datasets underlying many other models with which they may engage on a daily basis. Additionally, it questions the artistic utility of text-to-sound and text-to-music models, and the role of embodied cognition in musical artificial intelligence.

1 Motivation

Audio classifiers have been used for many purposes ranging from music genre classification, automatic captioning, and environmental sound recognition to forensics, surveillance, and criminal prosecution. However, the range of human sonic expressivity (particularly vocal sounds) is often not adequately encompassed by the ontologies and categories available for classification, nor are the variety and quality of the datasets necessarily reflective of that diversity.

yammer is an interactive audiovisual installation and performance environment that questions the ambiguities and limitations inherent in attempts to describe and represent music and other complex expressive sonic events using commonplace ontologies in audio classification systems. Not only is it difficult for many audio classification models to accurately identify both the physical sources of sounds and the actions that produce them with any degree of sophistication, the resulting slippage between action and object, between embodied sonic cognition and lexical fixity, yields an imprecision that ranges from humorous to grotesque. By focusing on the ways in which music resists the lexical descriptive framework at play in many of the analytical and generative tools being developed at present, yammer attempts to expose underlying datasets and ultimately re-center the body - not linguistics - as a site of knowledge production, storage, and transmission, particularly in artistic contexts.

2 Materials and Methods

AudioSet [1] is one of the most ubiquitous datasets used for training audio classification models, with YAMNet [2] being one such commonly-used model. The AudioSet ontology currently contains

*Research and creative work by this author can be viewed at https://tinatallon.com.

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632 audio event classes (though only the original 521 are used in YAMNet) ranging from machine and animal sounds to nonverbal human vocalizations - and even "silence." The most common event classes represented include Music and Speech, which are of particular interest to this artist in settings in which yammer is installed and the primary live audio input consists of human vocalizations.

2.1 Audio Generation and Manipulation

MediaPipe is used to access the YAMNet audio classification model, which classifies sounds according to the AudioSet ontology. The top three labels are passed to a custom patch in Max/MSP, where audio files from within the same event classes in AudioSet are selected at random and played back, processed, and manipulated to create an immersive accompaniment for the live audio input according to the spectral characteristics of that live input. Techniques used for processing and manipulation include convolution, granulation, spatialization, and temporal modifications related to both pitch and tempo.

2.2 Audioreactive Visual Generation

While the installation was initially conceived solely as an immersive sound installation, an audioreactive visual component is included to accompany the audio for the video submission format of the NeurIPS Creative AI track. Audioreactive visuals are generated based upon the spectral characteristics of both the live input and accompaniment using p5.js.

3 Limitations and Ethical Considerations

While the installation does invite the participation of visitors to the installation, live audio input is not recorded (except during exhibition conditions during which visitors to the installation are expressly informed that their voice and image may be recorded for documentation purposes), and thus no dataset is constructed or modified that correlates user input with eventual output.

It is acknowledged that audio associated with experimental sound art and contemporary classical music are not the intended inputs for most audio classification models, but by inviting open engagement with and perusal of the underlying dataset, this installation entreats those experiencing the installation to think critically about the provenance, quality, and subjectivity of data used to train ML models with which they may engage on a daily basis. Additionally, in settings where the installation will primarily invite engagement via the human voice, it exposes the ways in which nuances in human vocality may be misinterpreted by these models.

AudioSet is made available by Google Inc. under a Creative Commons Attribution 4.0 International (CC BY 4.0) license, while the ontology is available under a Creative Commons Attribution-ShareAlike 4.0 International (CC BY-SA 4.0) license.

It is worth noting that while the spectral information and ontology for AudioSet are accessible via Creative Commons licenses, the actual dataset itself is comprised of 10-second audio clips on YouTube, the uploaders of which may not even be aware that their content is used in the dataset. Many content creators tacetly agreed to their content's inclusion via lengthy and impenetrable terms and conditions, and as such, this work also problematizes the ubiquity of opt-in-as-default systems used by commercial entities to train their models.

Artist Biography

Winner of the 2022 Rome Prize in Music Composition, Tina Tallon is a sound artist, creative technologist, and engineer whose work explores the ways in which AI influences how artists engage with society. Her concert music and interactive installations have been widely performed and presented by ensembles such as the LA Philharmonic New Music Group, Ensemble Intercontemporain, wild Up, and Talea, in venues ranging from some of the world's most celebrated concert halls to the Venice Biennale, the Large Hadron Collider, major motion pictures, and leading AI conferences like NeurIPS. Recent commissioners include Lorelei Ensemble, VIVO Music Festival, and the Peabody Institute of Johns Hopkins University. She has received numerous awards from organizations such as the Harvard Radcliffe Institute, MIT, the American Academy in Rome, the American Academy

of Arts and Letters, and ASCAP. A passionate educator, Dr. Tallon currently serves as Assistant Professor of AI and Music Composition at The Ohio State University.

References

[1] Gemmeke, Jort F., et al. "Audio set: An ontology and human-labeled dataset for audio events." 2017 IEEE international conference on acoustics, speech and signal processing (ICASSP). IEEE, 2017.

[2] Ellis, D. YAMNet: A pretrained audio event classifier. 2019.

A Technical Appendices and Supplementary Material

All code, Max patch, and technical rider may be accessed via GitHub: `https://github.com/ttallon/LLMents_NeurIPS2025`

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