ABSTRACT

In the age of the internet, the music industry has yet to find ways to keep unauthorized copying, alteration, and distribution of material off the internet. Conventional methods of protecting copyright cannot cope with an era where digital files are so easily editable and copiable. Perceptual hashing is revolutionary because it produces distinct fingerprints of audio content that will remain recognizable when minor changes are made. Perceptual hashing, unlike cryptographic hashing that completely transforms with even slight data changes, will retain similarity and hence copyright infringement can be identified even when a file is pitch-shifted, sped up, or changed a bit. As a mediator between raw sound and digital copyright protection, perceptual hashing complements the potential for tracing and safeguarding intellectual property in a changing digital world. Combined with its application blockchain technology, the chance for a more effective protection of copyrights is increased multiple times. The transparency and tamper-resistance of blockchain ensure that a dedicated perceptual hash of an audio track becomes an unconditional, tamper-clear indication of ownership. Decentralization of blockchain prevents false claims and pretended modification, thereby making it a legitimate way of protecting copyrights. Additionally, smart contracts enhance the process even further by automatically issuing royalty payments and licensing terms without any middleman interference. Authors and copyright owners can then make fair use terms and get real-time, direct royalties every time their music is utilized. By combining perceptual hashing with blockchain, the music world can begin to have a more secure, transparent, easy understandable and artist-friendly system of intellectual property rights

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ABBREVIATION	EXPANSION
AAC	Advanced Audio Coding
AI	Artificial Intelligence
Blockchain	A decentralized, distributed digital ledger that records transactions across many computers in a secure and immutable way
CID	Content Identifier
Dapp	Decentralized Application; an application that runs on a blockchain network, often using smart contracts
DCT	Discrete Cosine Transform
DTW	Dynamic Time Warping
GAN	Generative Adversarial Network
Ganache	A personal local Ethereum blockchain used for testing and development of smart contracts
Gas	A unit that measures the amount of computational effort required to execute operations, such as transactions or smart contracts, on the Ethereum network
HADES	Hierarchical Audio Description and Encoding System
IPFS	Inter Planetary File System
LLE	Locally Linear Embedding
LPF	Low Pass Filter
MFCC	Mel Frequency Cepstral Coefficients
MP3	MPEG1 Audio Layer 3
NFT	Non- Fungible Token
Node.js	A JavaScript runtime built on Chrome's V8 engine that allows for server-side scripting and backend development
OLAF	Overly Lightweight Acoustic Fingerprinting
PCA	Principal Component Analysis

PIA	Protected Intellectual Assets
Solidity	A statically typed programming language designed for developing smart contracts on Ethereum and other blockchain platforms
SURF	Speeded Up Robust Features
Truffle	A development framework for Ethereum that provides tools for compiling, deploying, and testing smart contracts
URI	Uniform Resource Identifier
Web3.js	A JavaScript library that allows interaction with the Ethereum blockchain via HTTP or WebSocket connections to an Ethereum node