Date:

From

Rashmika S J (21BCS143), Reshika A S (21BCS145),

IV – CSE 'C',

Mepco Schlenk Engineering College,

Sivakasi – 626 005.

To

The Secretary,

Mepco Incubation Centre-Sivakasi,

(A society registered under the Registration of Societies Act XXI of 1860,

Regd. Office: SRG/Virudhunagar/21/2020)

Mepco Schlenk Engineering College Campus,

Mepco Engineering College Post, Sivakasi - 626 005,

Virudhunagar District, Tamilnadu, India.

Sir,

Sub: Request for Incubation Support at Mepco Incubation Centre-Sivakasi – reg.

We, the students of final year, Rashmika S J (21BCS143) and Reshika A S (21BCS145), belonging to the CSE department of Mepco Schlenk Engineering College, hereby request you extend the necessary facilities to incubate our proposal titled "Perceptual Hash Techniques for Audio Copyright Protection in Decentralized Systems" for the period of 6 months. We shall follow the rules and regulations of Mepco Incubation Centre-Sivakasi and MSEC, Sivakasi, during the approved incubation time period. We shall undertake the Incubated work strictly in accordance with the provisions specified by Mepco Incubation Centre, and We shall submit periodical reports about the progress of the work and final report on completion of the project on time.

Thank you,

Date: Yours Sincerely,

Place: Rashmika.SJ

Signature of the Incubatee(s)

Encl: 1. Incubation Support Requisition Form

Encl: 2. Brief Description of the Product/Services/Technology planned to incubate at MIC

MEPCO INCUBATION CENTRE-SIVAKASI

(A society registered under the Registration of Societies Act XXI of 1860,
Regd. Office: SRG/Virudhunagar/21/2020)
MEPCO SCHLENK ENGINEERING COLLEGE CAMPUS, Sivakasi - 626 005

INCUBATION SUPPORT REQUISITION FORM

1. Name & Affiliation of the incubatee(s):

   Rashmika S J (21BCS143), Reshika A S (21BCS145)

2. Title of your Product/Services/Technology proposal for Incubation:

   “Perceptual Hash Techniques for Audio Copyright Protection in Decentralized Systems”

3. Name & Affiliation of the Mentor(s):

   Dr. N. Kavitha, M.E., Ph.D

4. List any special requirements for usage of laboratory facilities & other professional services/support of Mepco Schlenk Engineering College (Autonomous), Sivakasi:

   NIL

5. Space Requirements for the incubation: No
   (If No, specify your location in the campus): VNCC Lab (CSE Department)

6. Duration of the Incubated Work (in months): 6

7. Are you going for startup after successful incubation: No

8. Profile of your Company (if applicable): NIL

9. **Brief Description of the Product/Services/Technology you plan to incubate in 250 words:**

A decentralized audio copyright protection mechanism has been established employing perceptual hashing and blockchain technology to protect the rights of sound creators. This mechanism confirms ownership, deters illegal reuse, and supports fair and transparent remuneration. It utilizes sophisticated audio fingerprinting technologies, i.e., Panako 2.0 and OLAF (Overly Lightweight Acoustic Fingerprinting), to create perceptual hashes that persist even after standard alterations like compression, pitch-shifting, time-stretching, or embedding background noise. These perceptual hashes preserve the distinctive acoustic characteristics of audio files and are retained along with critical metadata in a smart contract on the Ethereum blockchain, which gives a tamper-proof, verifiable proof of ownership. For decentralized file management, the system includes IPFS (InterPlanetary File System), enabling audio files to be securely stored and accessed through unique content identifiers (CIDs). When uploading an audio file, its fingerprint is matched against fingerprints recorded on the blockchain. When a match of 50% or greater is identified, the upload is rejected automatically to avoid possible infringement of copyright. An easy-to-use frontend, developed with ReactJS and MetaMask integration, enables smooth interfacing between users and the blockchain for secure transactions and verification. In addition, smart contracts are coded to make

royalty payments in real-time automatically, crediting the creator's wallet directly without involving intermediaries. Not only is this more transparent, but also artists get their due compensation in a timely manner. Particularly tailored for the music sector, this mechanism offers an efficient, durable, and resilient solution for decentralized digital rights management of audio material.

10. Business Plan (optional): NIL

Declaration:

We shall follow the rules and regulations of Mepco Incubation Centre-Sivakasi and MSEC, Sivakasi. The declaration and facts in the application are true and best to our knowledge.

Reshika:

Rashmika: Rashmika.SJ.

Signature of Incubatee(s) **Signature of Mentor(s)**

OFFICE USE ONLY: Approved: Yes / No Space Provision: Yes/ No

Duration (in Months):____months Location of incubation:

Signature of Secretary/MIC-Sivakasi

Mepco Schlenk Engineering College (Autonomous), Sivakasi

Department of Computer Science and Engineering

Guided By: Dr. N. Kavitha, Assistant Professor (Senior Grade)

Team members: 1. S. J. Rashmika (21BCS143)

2. A. S. Reshika (21BCS145)

Brief Description of the Idea:

Project Title: Perceptual Hash Techniques for Audio Copyright Protection in Decentralized Systems

This decentralized application (DApp) offers a blockchain-based system for guarding digital audio content using sophisticated perceptual hashing methods, Panako 2.0 and OLAF (Overly Lightweight Acoustic Fingerprinting). The users upload audio files via an easy-to-use ReactJS interface that is coupled with MetaMask to allow secure authentication and smooth blockchain transactions. Once a file is uploaded, the system produces a strong perceptual hash that represents the audio's essence, even if the uploaded file has changed in ways such as pitch shifting, time-stretching, or noise addition. The produced hash is then matched against hashes that are already stored on the Ethereum blockchain for checking possible copyright violations. If no satisfactory match is found, the file is stored on the InterPlanetary File System (IPFS) in decentralized and secure storage. Its Content Identifier (CID) and corresponding hash are immutably stored in a smart contract in the blockchain for transparency and tamper-proof storage of data. Furthermore, the DApp comes with an automatic royalty distribution platform, allowing creators and contributors to be paid immediately, transparently, for what they do. By leveraging advanced audio fingerprinting, decentralized storage, and automated smart contract functionality, this solution provides an equitable, secure, and scalable system for digital rights management, guaranteeing creators' intellectual property rights are protected and rewarded transparently in the digital media ecosystem.

Signature (Guide)

Signature (Team Members)

1. Rashmika :

2. Reshika:

CLOSURE REPORT

Perceptual Hash Techniques for Audio Copyright Protection in Decentralized Systems

The developed Decentralized Application (DApp) provides a tamper-resistant and end-to-end solution to audio copyright protection by integrating perceptual hashing mechanisms with blockchain technology. The core purpose of this DApp is to allow audio content creators to set up safe ownership and protect their intellectual property from unauthorized copies, remixing, and redistribution. Employing Panako 2.0's perceptual fingerprinting features, combined with the OLAF (Overly Lightweight Acoustic Fingerprinting)audio search engine, the DApp generates strong and stable fingerprints from audio content. These perceptual hashes resist typical audio changes, like compression or minor distortion. They are then stored on the Ethereum blockchain through the utilization of smart contracts, providing permanent, tamper-evident ownership proof and traceability.

To complement blockchain immutability with decentralized file storage, the DApp leverages IPFS (InterPlanetary File System) for storing audio files and generating unique URIs. A front-end interface built with ReactJS allows users to upload their audio content, which is then processed to generate a perceptual hash and checked for similarity against existing hashes on the blockchain. If the similarity is found to be 50% or higher, the DApp rejects the upload outright, thus averting copyright infringement. Stringent testing was carried out against standard audio transformations like pitch shifting, time-stretching, noise injection, and re-recording. The DApp had a success rate of 98.5% in detecting unauthorized changes, thereby solidifying its credibility in the management of real-world audio variations.

Aside from detection and verification, the DApp addresses the concern of fair and automatic royalty distribution using smart contracts. Whenever a registered audio work is consumed—either streamed, downloaded, or licensed—the smart contract triggers micropayments directly to the owner's wallet, maintaining transparency and without third-party involvement. Real-time royalty serves to encourage equal compensation for artists. In the future, the DApp will continue to grow with future extensions such as a standalone mobile app, AI-driven tampering analysis, and improved IPFS performance for mass deployments. This DApp provides a functional, secure, and decentralized system that empowers creators and revolutionizes digital audio rights management and protection.

Guided by,

Dr. N. Kavitha**,** M.E., Ph.D.,
Assistant Professor (Sr.G)/CSE

Team Members,

S.J. Rashmika (21BCS143)
A.S. Reshika (21BCS145)

Signature of the Guide