What is claimed is:

CLAIMS

1. A computer-implemented method for hiding copyright information in a display screen, the method comprising:

generating, by a computing device associated with the display screen, a unique identifier (ID) based on copyright information associated with a digital content, wherein the copyright information and the digital content are recorded on a blockchain of a blockchain network, wherein the unique ID comprises a public key certificate issued by a certificate authority, the public key certificate comprising a digital signature of the certificate authority;

determining, by the computing device, one or more attributes associated with the display screen, wherein the one or more attributes include one or more of a pixel density, a pixel intensity, a transparency, a hue, a refresh rate, colors, angles, fonts, a texture, a brightness, spatial or frequency coefficients, or other characteristics of data carriers, a displaying format, and/or pixel positions, size, angle, shape of a font or punctuations; and

embedding, by the computing device, the unique ID in content presented on the display screen by changing the one or more attributes associated with the display screen, the unique ID not being apparent to an unaided human eye when displayed on the display screen and enabling retrieval of the copyright information from the blockchain based on the unique ID.

2. The computer-implemented method of claim 1, further comprising:

before generating the unique ID, authenticating, by the computing device, that a copyright holder holds a copyright of the digital content based on a blockchain transaction ID associated with a transaction that recorded the digital content in the blockchain.

3. The computer-implemented method of any one of the preceding claims, wherein the display screen is integrated in or attached to a display device.

4. The computer-implemented method of claim 1, wherein embedding the unique ID in content presented on the display screen comprises embedding an index of multiple layers of unique IDs in content presented on the display screen, the index assisting extraction of the unique ID and at least one other unique ID embedded in content presented on the display screen.

5. The computer-implemented method of any one of the preceding claims, wherein the one or more attributes are identifiable from reproduction of visual content displayed through the display screen.

6. The computer-implemented method of any one of the preceding claims, wherein the copyright information includes one or more of at least a portion of the digital content or identity information of a copyright holder of the digital content.

7. The computer-implemented method of claim 6, wherein the digital content is recorded on the blockchain as a first transaction associated with a first blockchain transaction ID and the identity information is associated with a second transaction associated with a second blockchain transaction ID, and wherein the first blockchain transaction ID or the second blockchain transaction ID is associated with one or more transaction records associated with the digital content.

8. The computer-implemented method of claim 7, wherein the one or more transaction records include one or more of creatorship, copyright ownership, update history, a timestamp, a location, or a license associated with the digital content.

9. The computer-implemented method of any one of the preceding claims, further comprising digitally signing the unique ID using a private key assigned to the copyright holder.

10. The computer-implemented method of any one of the preceding claims, wherein the unique ID is generated based on one of hashing the copyright information using a hash

function or encrypting the copyright information using a public key assigned to the copyright holder.

11. The computer-implemented method of any one of the preceding claims, wherein the unique ID is further generated based on one or more of a timestamp or an address associated with the copyright information.

12. The computer-implemented method of any one of the preceding claims, wherein embedding the unique ID is performed based on one or more of a discrete wavelet transform, a discrete cosine transform, a singular value decomposition, a least significant bit, or undetectable steganography.

13. A system for hiding copyright information in a display screen, comprising:

one or more processors; and

one or more computer-readable memories coupled to the one or more processors and having instructions stored thereon which are executable by the one or more processors to perform the method of any one of claims 1-12.

14. An apparatus for hiding copyright information in a display screen, the apparatus comprising a plurality of modules for performing the method of any one of claims 1-12.