stockblock

Artwork Copyrights and attribution on Blockchain

28.09.2017

Overview

"A picture is worth a thousand words"

Very true, but when that picture is protected by image copyright, you might get cease and desist for using it without permission. Every day you're inundated by images. They appear in tweets, texts, and articles. You've probably laughed, liked, and shared countless ones. But have you ever wondered where the original image came from? More importantly, is that person even getting proper credit?

Most people think by adding a couple of words, they've created an original image, or by adding a different filter, they've created an original JPEG.

Wrong. The harsh reality is that's not always the case. The "text" or "filter" might be "original," but the image isn't. Being unaware of copyright rules for images will leave a dent in your wallet.

The copyright law of the United States tries to encourage the creation of art and culture by rewarding authors and artists with a set of exclusive rights. Copyright law grants authors and artists the exclusive right to make and sell copies of their works, the right to create derivative works, and the right to perform or display their works publicly. These exclusive rights are subject to a time limit, and generally expire 70 years after the author's death. In the United States, any music composed before January 1, 1923, is generally considered public domain.

Problem

Protecting your artwork

Copyright law provides a creator with several critical and powerful rights over their work. Registering your artwork is mandatory to win cases in court.

Copyrighting your artwork alone is not enough. Let's say you register your image and use it on your website or sell it on stock photography website. Now, anyone can download the image without your permission, add/modify the image as per need and use it either online or offline.

There is no way to locate stolen copies of your artwork on the world wide web. You can google it and locate copies. Looks good for single image or a dozen images may be. What if you have hundreds of images?

That is problem no. 1.

It is not important to copyright your thousands of images legally. When you click the shutter, you own the copyright. What if someone stole the image from you and published it online before you do? You need to prove the proof of publication to win a case.

That is problem no. 2.

When you sell your artwork online or via stock photography websites, it is impossible to track who the image was sold to. How many clients bought those images. This information is never shared with its creator. There is certainly no ownership or transaction history.

That is problem no. 3.

Solution

❖ Proof of ownership

Registering your copyright is the best way to prove ownership. When you click that shutter you own your copyright. StockBlock is not an alternative to it. But it is the second best to help win cases in court. With the help of Blockchain technology, content creators will be able to timestamp their artwork copyright and attribution. Whenever you upload your artwork on StockBlock, the information is recorded on blockchain. A fingerprint of your image along with your details is timestamped using smart contracts on ethereum blockchain.

❖ Proof of Publication

After time stamping your copyright information on the blockchain, the image is binded with proof-of-publication. All information regarding the time stamp and a copy of the image is presented in a PDF format. Our lawyers are working out on the legalities of the same so it becomes a proof of publication. More of a digitized birth certificate of your artwork.

❖ Marketplace

After proof-of-ownership and proof-of-publication, the images are approved by moderators for quality & technical purposes.

The platform uses perceptual hashing to track any duplicate images. There won't be any duplicate images in the system.

Same user can have multiple similar images(altered like blurred, grayscale etc) as the same user owns it. There can not be two similar images in different user accounts.

This also helps keeping fraudsters off the system. If someone uploads a stolen image, the account is flagged and a ticket is opened for dispute. The fraudster is flagged for plagiarism.

The system search also uses the perceptual hashing system to display the search results.

> ➢ Finding similar images (With phash score more than 90%)
> ➢ Finding visually unique images. (With phash score less than 10%)

Reference: http://stockblock.io/fingerprint/

The marketplace platform is fraudster-proof. With unique, verified, attributed content, the buyer is assured of buying genuine artwork.

To secure the platform further, the registration of artist is invite only. It is a *blockchain of trusted media artist*.
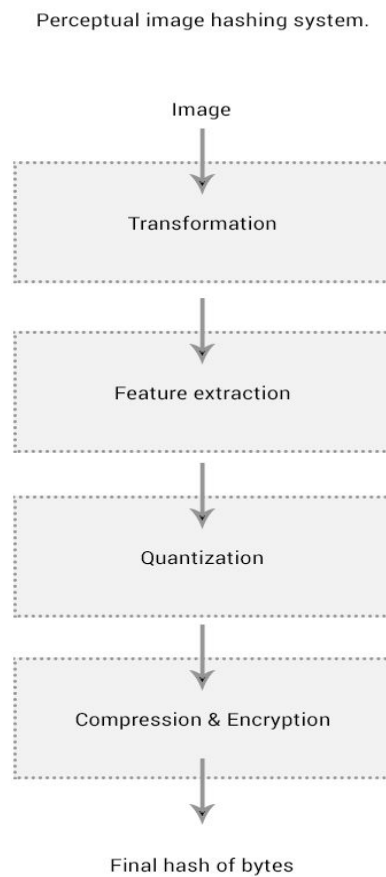
❖ Tracking your Artwork

The platform will be able to track your images online. Using fingerprint the system will crawl the world wide web and look for similar fingerprints online. If any similar images are found online they will be listed under the artwork tracking history for the user. The author decides further actions.

Technology

★ **Perceptual hashing**

Perceptual hashing is the use of an algorithm that produces a snippet or fingerprint of various forms of multimedia. Perceptual hash functions are analogous if features are similar, whereas cryptographic hashing relies on the avalanche effect of a small change in input value creating a drastic change in output value.

Perceptual image hashing system.

Image

↓

Transformation

↓

Feature extraction

↓

Quantization

↓

Compression & Encryption

↓

Final hash of bytes

The perceptual hash generates near unique fingerprint of images, even after an image that has been altered with blur, grayscale effect. The hamming distance between the two hashes defines the similarity of the image.

Original Image

Hex:
11000000000111110011111100111111000010111111100011011101111011111

phash: c01f3f3f0bf8ddef

The distance then can be converted to percentage to determine the similarity of the images. Below is an example of the hash generated and its hamming distance.

The above generated hex and hash can be compared with the altered images below to calculate the hamming distance.

Blurred Image

Hex:
010000000001111110011111100111111000000111111
110001101110111101111

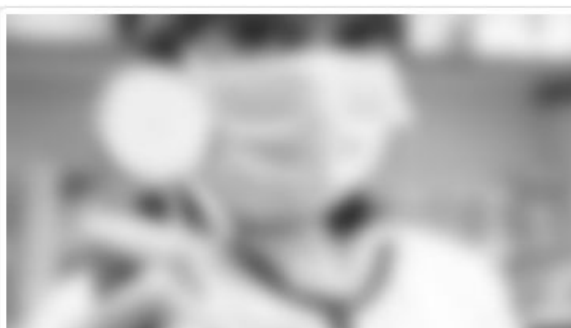phash: 403f3f3f07f8ddef

Similarity: 93.8

Blurred & black patch

Hex:
110000000001111110011111100111111110001111111
110001101110011111110

phash: c03f3f3f8ff8dcfe

Similarity: 90.6

Even after blurring and adding layer of black patch the algorithm is able to identify the original image. This algorithm also works when the image is altered using high contrast, grayscale or even resizing the image.

Blurred Grayscale

Hex:
010000000001111110011111100111111000000111111
110001101110111101111

phash: 403f3f3f07f8ddef

Similarity: 93.8

Original & Different file name

Hex:
110000000001111100111111001111111000001011111
110001101110111101111

phash: c01f3f3f0bf8ddef

Similarity: 100

Below is an example of image rotation or flipped images. Manipulating the uploaded image with different set of views to compare it with the original images is possible. Further these hashes can be compared depending on the hamming distance.

Flipped V

Hex:
11101111110111011111100000001011001111111001
111110001111111000000

phash: efddf80b3f3f1fc0

Similarity: 50

Flipped H

Hex:
11110000000011110000111100011111000100100011
11000011111101111110011

phash: f00f0f1f12387ef9

Similarity: 71.9

Hamming distance between two strings of equal length is the number of positions at which the corresponding symbols are different. In other words, it measures the minimum number of substitutions required to change one string into the other, or the minimum number of errors that could have transformed one string into the other. In a more general context, the Hamming distance is one of several string metrics for measuring the edit distance between two sequences.
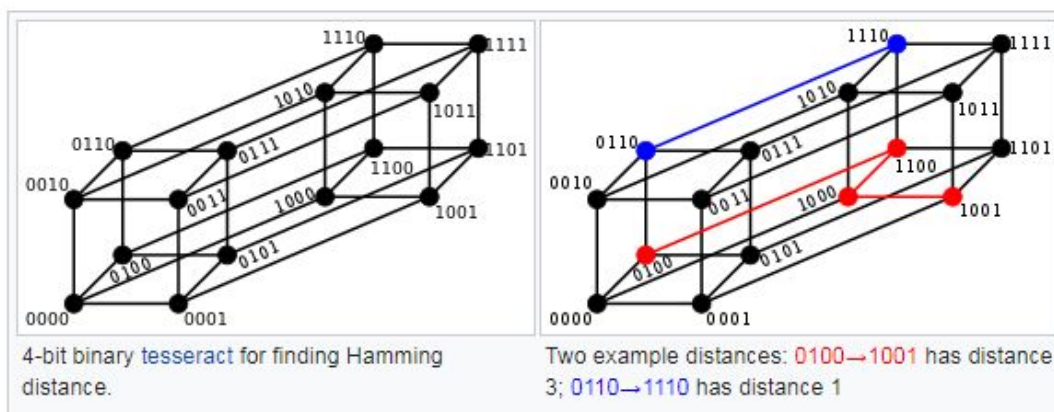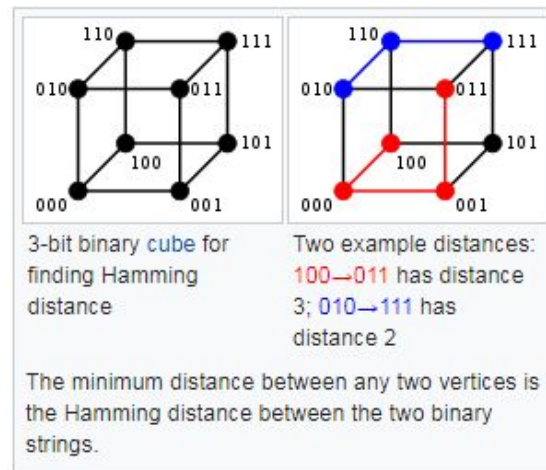
Hamming Distance (Image from Wikipedia)

★ Invisible Watermark

We are working on this feature where the image gets watermarked with author's copyright and attributes which will be invisible to human eye. The watermark will be invisible and can only be viewed using app. This feature will be developed in later stage depending on the feasibility. We need to evaluate the visual cryptography methods to realize its potential usage. Using this a user can scan and decrypt the hidden watermark to verify copyright & attribution information.

★ **Image Monitor**

All images uploaded on the platform will be monitored for copies on the internet. The database will crawl for image and save its fingerprint along with the url's, title and image location. Monthly/weekly reports can be received via email to check stats about authors images. More features will be added depending on the statistics and community suggestions.
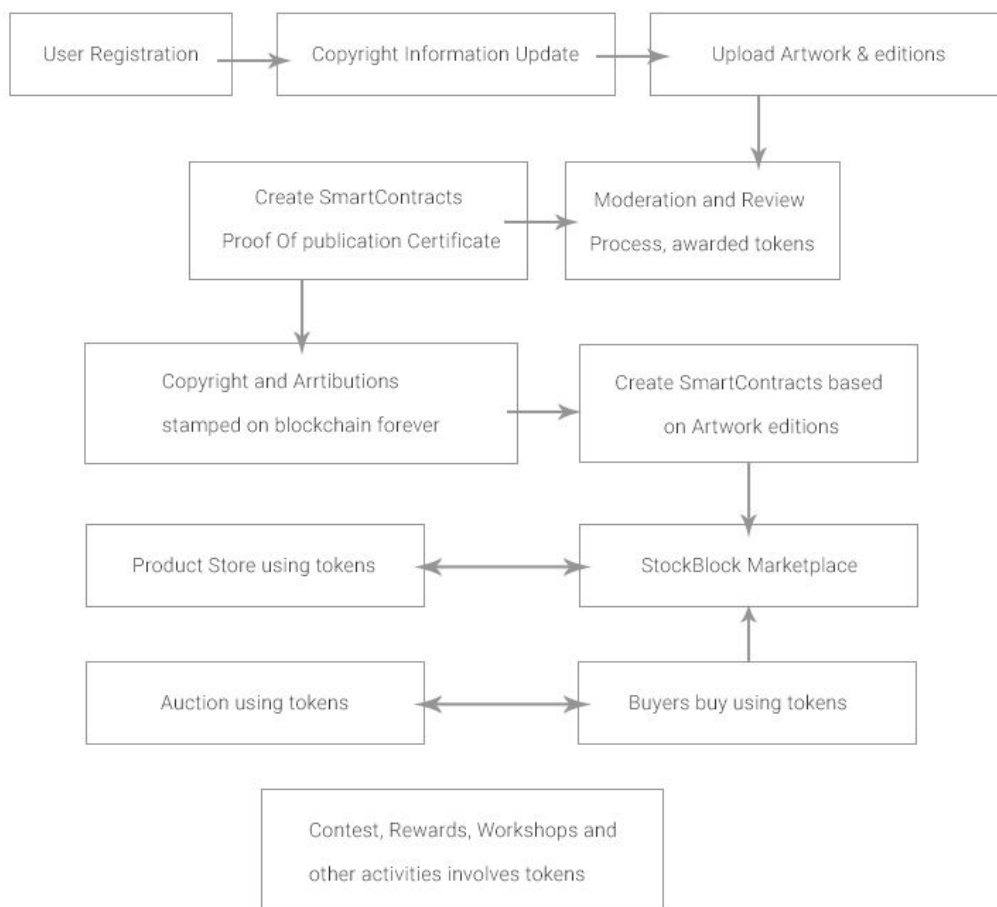
★ **The StockBlock Ecosystem**
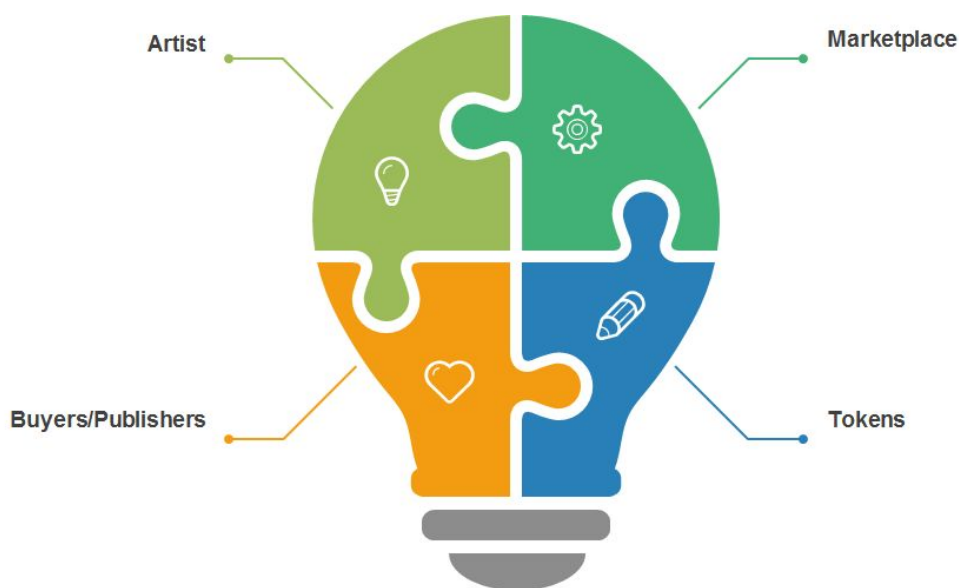
The whole system revolves around these four elements.

ERC20 Tokens (XMC)

StockBlock.io tokens are ERC20 standard tokens. The token will power the entire StockBlock ecosystem. The moderators, blogs writers, artist, and every activity involved in the ecosystem will function on tokens. This in turn will fuels the economy and exchange price of the tokens.

10% of the total supply will be allocated for ICO Marketing & rewards. For more details on the breakup please check below para on token supply and allocation.

Moderators/Reviewers

The uploaded images need to be moderated for quality and technical purposes.

Marketing

To motivate the artwork community and attract potential buyers

Community

Community involves in development of the platform eg: feature request, blogs, reviews etc

Social Activities

Workshops and photo-walks and more activities to create a culture around the project.

Promotions

Artwork auctions & contest Product launch and reviews

Partnerships

Grow the business with brand partners like Canon Nikon, etc

There will be tons of activities for example photography contest, workshops, and local clubs to promote the platform.

The idea is to build a culture and grow the community. All rewards and earnings will be paid in tokens. We might likely provide auction service for artwork too. Similarly weekly or monthly artist of the month contest will be held to promote the author's artwork. The artist get paid in tokens which they can trade in exchanges for other currencies. Utmost importance will be given to the community suggestions.

We also plan to introduce affiliate programs once the marketplace platform goes live. XMC tokens will be the currency to trade all artwork and services on StockBlock platform.

Partnership

Brands & communities like Canon, Nikon, BNH and similar will be approached to partner with StockBlock for activities and promotions. From product launch to new gears advertisements and reviews will be posted on the blogs to keep the community updated. Companies can offer discounted products which can be bought using the XMC tokens. The marketing team will be working with such partners to help grow the ecosystem in different possible ways.

Team

We are a small team working on the project. We are not big names in the industry but we are committed to our work. We look forward to grow our team with community support. If you would like to help the project development please feel free to email us with your inputs to social@stockblock.io or chat with us on telegram channel: t.me/stockblock

Please feel free to join the discussion. You might find few people to start with as we are not luring spammers for fake discussions. Please be patient.

Token Supply & Allocation

Only 250,000,000 XMC tokens will be created. Below is the breakup of the tokens.

Allocated for	Percent	Tokens
Pre-ICO	10%	25,000,000
ICO	55%	137,500,000
Marketing	5%	12,500,000
Future Development	20%	50,000,000
Team	10%	25,000,000

Crowdsale

25,000,000 tokens will be sold in pre-ico at 3000 XMC tokens per ether. Minimum 60 ether per transaction required to take part in pre-ico. Pre-Ico starts on 15th October till 25th October 2017. Please register for Pre-ICO on the website.

Token sale will offer 137,500,000 XMC tokens from 25th October till 25th November 2017. ICO offers 2000 tokens per ether. The tokens will be transferred immediately after purchase.

You need to send ether using the following wallets. Please do not send ether from exchanges. You won't be able to receive tokens.

The unsold tokens will be locked in smart contract for 3 years.

5% i.e 12,500,000 XMC token will be rewarded for bounty and contest campaigns. The tokens will be sent at the end of the ICO.

For future 20% will be reserved for development, marketing campaigns, contest and liquidity. The funds will be locked for 2 years.

Founders & team members will receive 10% tokens. The funds will be locked for 2 years.

Please check the website for more info on the Pre-ICO & ICO.
http://stockBlock.io

We thank you for reading our white paper. We as a community are here to collaborate and help solve copyright infringement problems and in turn credit, attribute the authors for their artwork. This will empower the artist rights and provide a better way to monetize their artwork, leading a better living. We need your support to make this happen.

Please visit our website. If you have any questions please feel free to ask on

Bitcointtalk forum: https://bitcointalk.org/index.php?topic=2198936

Twitter: https://twitter.com/stockblockio

Facebook: https://www.facebook.com/StockBlockmedia/

Telegram: https://t.me/stockblock

References

1) *Ethereum Project: https://ethereum.org/*
2) *Blockchain: https://en.wikipedia.org/wiki/Blockchain*
3) *Ethereum EVM: https://en.wikipedia.org/wiki/Ethereum#Ethereum_Virtual_Machine*
4) *Cryptocurrency: https://en.wikipedia.org/wiki/Cryptocurrency*
5) *Smart Contracts: http://opentransactions.org/wiki/index.php?title=Smart_contracts*
6) *ERC20 Token Standard: https://theethereum.wiki/w/index.php/ERC20_Token_Standard*
7) *Solidity: https://solidity.readthedocs.io/en/develop/*
8) *Perceptual Hashing https://en.wikipedia.org/wiki/Perceptual_hashing*
9) *Hamming distance https://en.wikipedia.org/wiki/Hamming_distance*
10) *Phash: https://www.phash.org/*
11) *Creative Commons, "Creative Commons Licenses" http://creativecommons.org/licenses/*
12) *Google Inc., "Google Image Search" https://www.google.com/imghp*
13) *Wikipedia, "Proof-of-work system" http://en.wikipedia.org/wiki/Proof-of-work_system*