# RGB Network

akultra.eth

## Abstract

RGB Network is the name used to refer to the collection of the three cryptocurrency tokens RED, GRN, and BLU and the interactions that take place between those tokens. The initial goal of RGB Network is to introduce a novel data visualization scheme that plots assets in digital color space and use this approach to create the first of what can be considered unsupervised evolutionary assets.

## Introduction

In the world of finance, correlation is a powerful tool that can be used to compare the distinct patterns between assets and group those assets into categories. The problem as of now with visualizing this feature of correlation is that it can only be plotted along a single dimension of time. To solve this problem we propose our novel data visualization scheme. By leveraging digital colorspace we can instead visualize correlation as a gradient between the three dimensions of red, green, and blue. This method presents a more intuitive way to consider multiple correlations and describe those features for the purpose of grouping assets.

The question is then presented of what should represent the dimensions of red, green, and blue? Here we propose the tokens RED, GRN, and BLU to represent the three dimensions respectively. The tokens will in a technical sense be completely identical only differing in name as they will be deployed with three copies of the same contract at the same time. For the tokens to be effective within the proposed data visualization scheme they need to diverge in price action to a certain degree. This will be incentivized by pairing the tokens against each other in liquidity pools on a decentralized exchange and forming independent decentralized autonomous organizations (DAOs) for community governance of each token. Our hope is that over time the three tokens will evolve to represent distinct sectors of the market where this evolution is guided in an unsupervised sense by the communities that form around the platform.

## Approach

In this section we will detail the theory and simulation of the proposed data visualization technique and expand upon the concept of unsupervised evolutionary assets. The general concept behind the technique can be outlined in the following steps:

1. Deploy three tokens that represent the colors of red, green, and blue

For this portion of the technique we will deploy the three mentioned RGB Network tokens RED, GRN, and BLU. As outlined above these tokens will use the same contract and be deployed at the same time. The specifics of the token contract can be found in the tokenomics section of the paper. The purpose of this constant is so that prior to launch no one token is preferable over another. After launch we aim that the divergence of the tokens in what they represent is solely community guided. This leads into the concept of an unsupervised evolutionary asset. Opposed to trying to force or supervise the tokens into representing specific sectors of the market we will allow them evolve over time to fit trends in the also evolving market. The idea is comparable to a k-means clustering algorithm where instead of clustering points we use tokens and instead of a computer we use the market as a computational engine.

2. Incentivize divergent price action between the tokens

This section is highlighted by the two main methods proposed for incentivizing a divergence in price action between RED, GRN, and BLU. The first method is to pair the tokens on a decentralized exchange, not just against an underlying asset but also against each other. This will create a total of six liquidity pools for RGB Network: RED/ETH, GRN/ETH, BLU/ETH, RED/GRN, GRN/BLU, and BLU/RED. Volume to the latter three pools will guarantee that the tokens will to some degree diverge in price action. This also serves the purpose of allowing traders to swap within the RGB Network in a single transaction. In addition, this structure

presents unique opportunities for arbitrage between pools which we are excited to see as it has the potential to further diverge trend.

The second method to incentivize divergence is to form three independent DAOs for each token with a treasury of that token. RED, GRN, and BLU will grant holders voting power within the respective DAO and allow the communities that form around each token to decide how to utilize its treasury. More information on the structure of the DAOs can be found in the tokenomics section of the paper.

3. Measure the correlation of other assets to each token

Moving forward, we can now individually compare the returns of other assets to the returns of RED, GRN, BLU on a specified time frame. This is performed by simply calculating the Pearson correlation coefficient  given by the following function

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

$r$ = correlation coefficient
$x_i$ = values of the x-variable in a sample
$\bar{x}$ = mean of the values of the x-variable
$y_i$ = values of the y-variable in a sample
$\bar{y}$ = mean of the values of the y-variable

4. Use correlation values to construct a RGB color value

Given the correlation coefficients we can then use those values to construct a RGB color value. On a digital screen the color of a pixel is constructed with red, green, and blue values ranging [0,255]. With the given correlation coefficients ranging [-1,1] we can simply ceiling negative values to 0 and then multiply by 255 to produce the three values necessary to construct a color. A simulation of this concept can be demonstrated with Figure 1 below. This chart shows four random walks that we can interpret as RED, GRN, BLU, and some asset XYZ. The  correlation coefficients of XYZ to RED, GRN, and BLU are 0.1058, 0.1294, and 0.7922

respectively. These values would give us an RGB value (27, 33, 202) or #1B21CA hexadecimal for XYZ which can be interpreted as this color

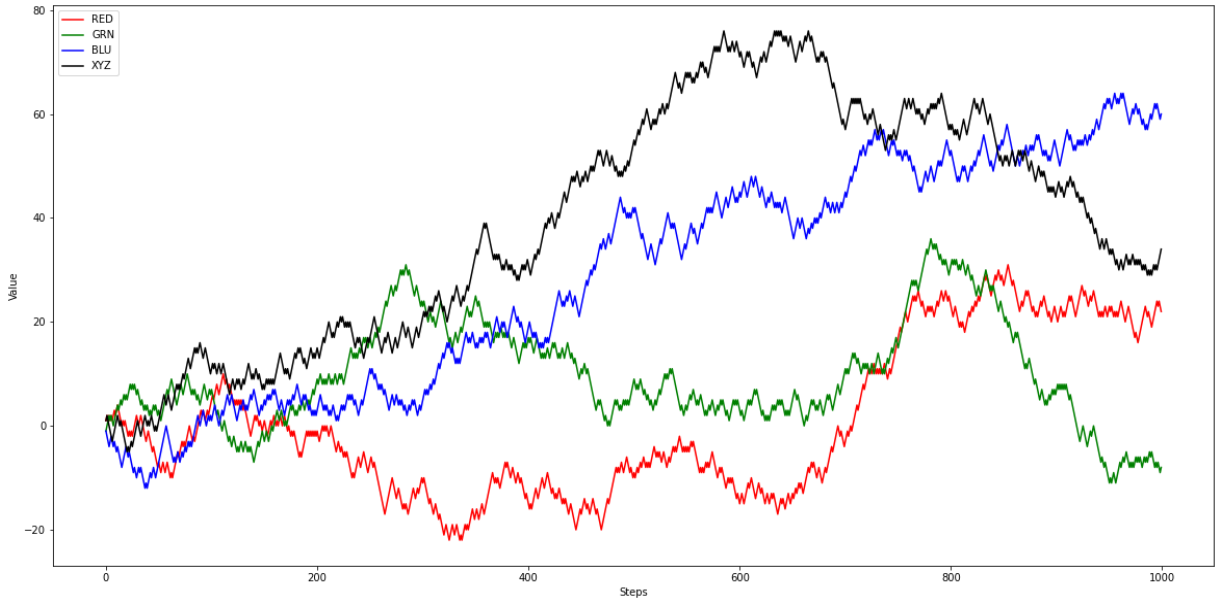


Figure 1: Random walk simulation

5. Use RGB color values to plot assets in colorspace

Now that we can construct a color value for a given asset we can plot this value against the color of other assets in color space. A demonstration of this concept can be seen in Figure 2 where we create a 3D scatter plot for the color values of 25 assets. In this plot the X, Y, and Z axes are the correlations to RED, GRN, and BLU respectively and the resulting RGB color value is encoded onto each point.

This idea can then be taken a step further by considering hue, saturation, and value (HSV) color space shown in Figure 3. This color space is a popular choice for digital color pickers where the top face of the cone can be used to select color along a two dimensional wheel. Within the context of HSV color space, any two assets with constant hue and saturation will have the same ratio of correlation to RED, GRN, and BLU. After converting from RGB values to HSV values, similar assets can be searched along the wheel and sorted tabularly by value where that value can be interpreted as a stronger confidence of correlation.

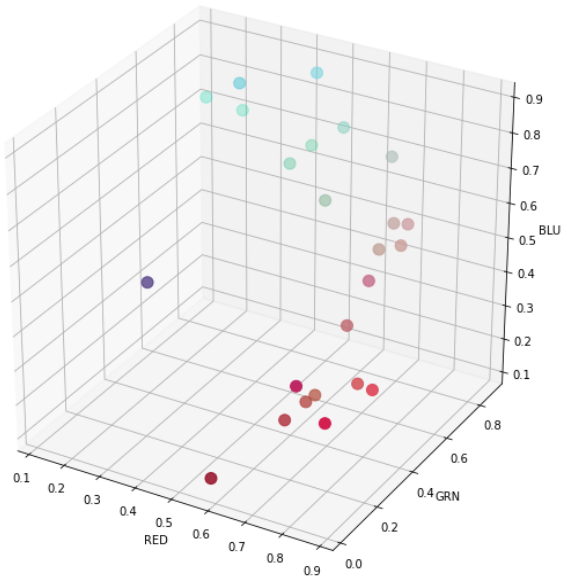


Figure 2: RGB 3D scatter plot

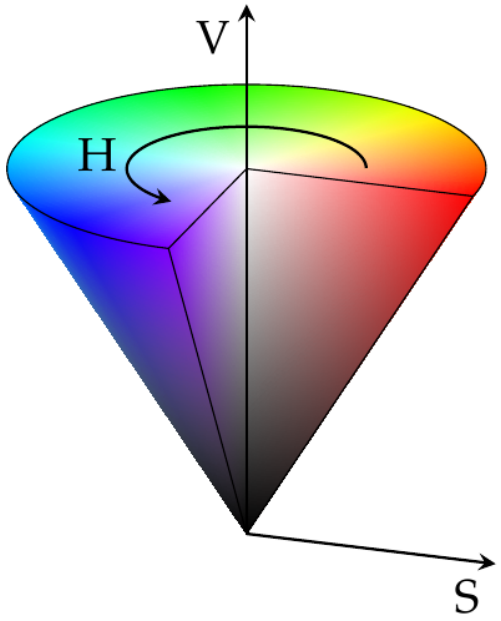


Figure 3: HSV color space

## Tokenomics

Each token RED, GRN, and BLU will be minted with a base ERC-20 utility token contract on the Polygon blockchain and have a total supply of 1,000,000,000. The distribution of all three tokens can be seen in Figure 4 and is as follows: 45% Public Sale, 25% DAO Treasury, 15% Locked Liquidity, 10% Team, and 5% Marketing. The 45% devoted for public sale will be moved to the MISO launchpad where we will attempt to raise at least 50 ETH in each token sale. From there 75% of the ETH raised will be matched with 7.5% of the supply devoted to locked liquidity for the base liquidity pools. The remaining 7.5% devoted to locked liquidity will be matched with the other two tokens for the internal liquidity pools. All liquidity pools will be hosted on Sushiswap and the liquidity tokens will be sent to a locker contract. The locker contract will have a base lockup of 1 year. Upon expiry the team will evaluate the options of either migrating or relocking the liquidity. The 25% supply devoted to the DAO treasuries will be moved to the multisig DAO wallets. Voting for the utilization of this treasury will take place on Snapshot where each token will be worth a single vote. The 10% supply

devoted to the team will be moved to a lockup contract. The tokens will be released over the span of 2 years with 2.5% being unlocked every 6 months.  All team members will abstain from voting in the DAOs. Finally the 5% supply devoted to marketing will be distributed in the airdrop campaign following launch.

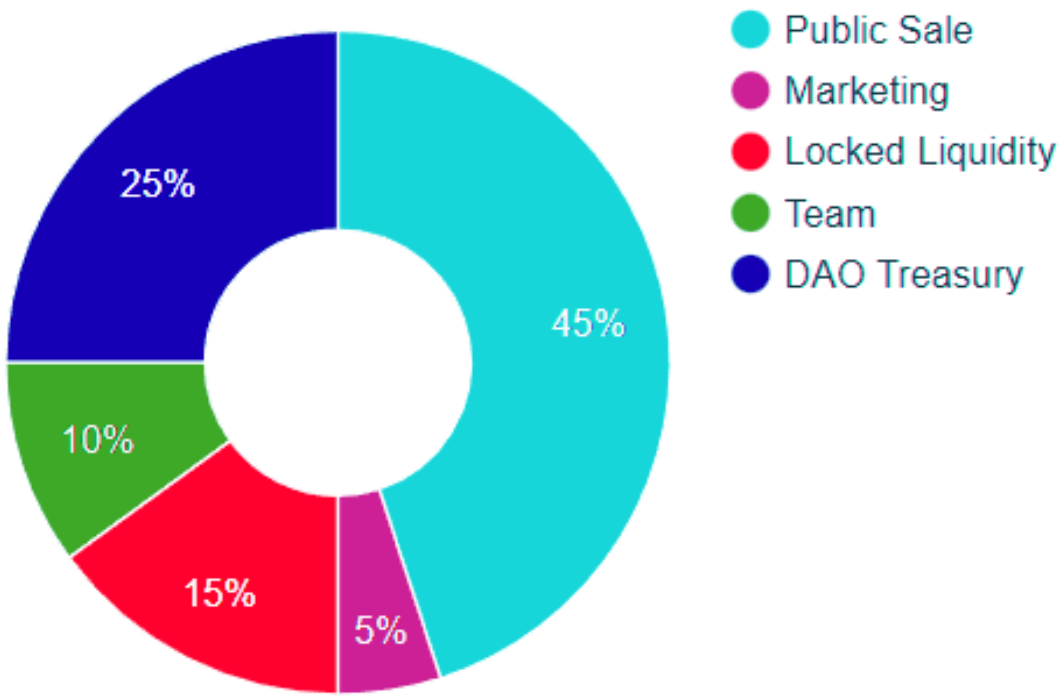


Figure 4: Token distribution

## Future Work

Following launch, our team has several plans to continue the development of RGB Network. The main area of future development will be a decentralized prediction market where traders can wager whether an asset will increase or decrease in correlation to RED, GRN, and BLU. Positions will be minted as NFTs that can be traded on a secondary market prior to expiration. This area of development will open up new opportunities for traders and add to the use of the data visualization app.