

**Lab 1 - First Draft**

**CS410 - Spring 2022**

**Art Guardian - Team Blue**

**Carlo Diaz**

## 1. Introduction

Adapting to developing technologies, artists have found great value in the digital art sector; art can be minted into a non-fungible token (NFT) and sold on a blockchain. An NFT is a unique cryptographic token on a blockchain that cannot be replicated. In recent years, interest in NFTs have increased dramatically from an average of about 100 sales per week in late 2017 to about 80,000 per week in early 2020 (Barber 2022). In addition to popularity, the value of NFTs have also seen a quick uprising with statistics showing the NFT market was at \$100 million in 2020 and hit \$41 billion in 2021 (Dailey 2022). According to ArtDiction, an artist was able to sell an NFT of his collaged artwork for \$69.3 million (ArtDiction 2021).

With these numbers in mind, it is clear to see that digital artists are directly impacted by any situation involving someone else stealing their original art and benefiting from it through NFTs. A popular digital art platform, Deviantart, reported a 300% increase of art theft in just a single month, reaching up to 90,000 possible cases of art theft (Beckett 2022). When an artist has their artwork stolen, minted into an NFT, and put for sale on the NFT marketplace, the original artist has to undergo a very tedious process. The artist will have to manually search for the NFT with their artwork on hundreds of NFT marketplaces with thousands of NFTs for auction, manually send a Digital Millennium Copyright Act (DMCA) takedown request, and repeat this process if their artwork is ever stolen and minted again.

Art Guardian seeks to provide assistance for these artists. Art Guardian is a progressive web application where digital artists can upload their artwork to the database, and through web crawlers, template matching, and efficient use of APIs, artists will have a tool that *automatically* searches for stolen artwork on various NFT marketplaces and simplifies the process of requesting a DMCA takedown request.

## **2. Product Description**

Art Guardian is a progressive web application, meaning it will be available on both desktops and mobile devices. It will have a user-friendly interface to prevent any issues or complications that could disrupt the user experience.

### **2.1 Key Product Description and Capabilities**

When users sign up for Art Guardian, they will have to provide their legal information such as first and last name, contact information, address, and date of birth to allow legitimacy and verification of identity. They will also be able to link their art account if they choose to do so. Art Guardian's database will store every user's original artwork. Users will have a profile so they can see their uploaded art and view the statuses of them. As soon as a piece of art is uploaded to the database, Art Guardian protects that artwork with its automatic NFT marketplace detection.

The major feature of Art Guardian is its *automatic* detection of stolen art as NFTs. Through web crawlers and template matching, Art Guardian prevents users from having to manually search for their stolen art on these various marketplaces. This feature will save hours, even days or weeks, of simply finding the NFT that infringes upon their art; even if they do manage to find it, they would still have to manually search for it if it is stolen and minted again. Art Guardian's system of automatically detecting stolen art as NFTs will run no matter how many times a piece of art is stolen, saving artists the work and time into fixing their issue.

Once a stolen piece of art's NFT transaction has been found, a notification is automatically sent to the original artist. The notification will provide in-depth information about

the NFT transaction, such as the NFT image, token, seller, and link to the marketplace which it is being sold on. There will be a procedure that ensures the user is, in good faith, the original artist and that they want to send a DMCA takedown request for that specific NFT. Once they approve of everything in this procedure, Art Guardian will provide an automatically-filled DMCA takedown request for the user to review. Users will provide an e-signature to send the request, and Art Guardian will have a feature that allows artists to monitor the statuses of all of their DMCA takedown requests.

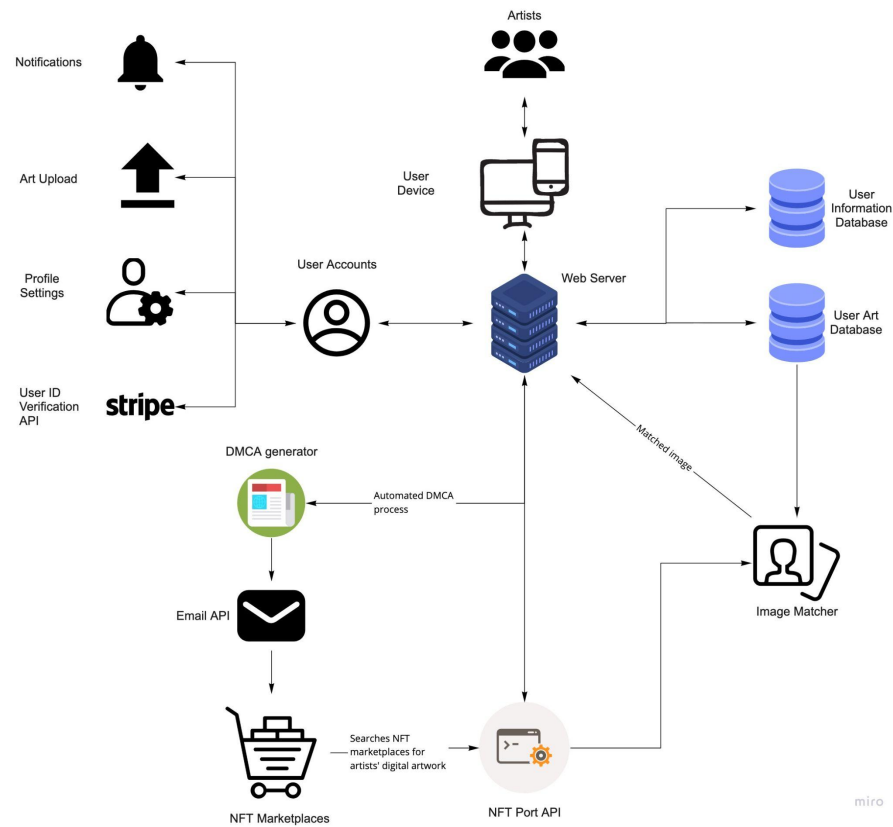
Art Guardian will also have a general section of guidance to protect digital artwork. This section is simply for artists to read and browse, as it will include updated articles, posts, and FAQs pertaining to actions taken for users to protect their digital art.

The interfaces of the desktop and mobile applications will be very similar to ease navigation and user functionality between both systems. Users will be able to use either form of the application, and all of Art Guardian's features are available to both forms.

## **2.2 Major Functional Components**

Art Guardian is a progressive web application, so it will be available on both desktops and mobile devices. HTML, CSS, and JavaScript will be utilized for the desktop website and React Native will be used for mobile devices. Git will be used for version control, continuous integration, and continuous development. Amazon RDS and MySQL will be used with the database to provide encryption for the stored artwork. AWS will be the standard web server for Art Guardian. OpenCV will be used for the template matcher, which will compare NFTs with artwork on Art Guardian's database. It will utilize the NFT Port API to assist in searching NFT marketplaces for stolen artwork as NFTs. The Stripe API will be used to assist in user identity

verification. The Gmail API will be used to assist in sending the pre-filled DMCA takedown request to users' emails.



### 3. Identification of Case Study

Art Guardian is aimed directly towards digital artists to prevent unsolicited minting of their artwork. Digital artists will have a higher sense of protection for their artwork as the NFT marketplace is constantly growing in value and popularity. Also, commissioned artists will be directly benefited from Art Guardian because there is no risk of their copyrighted material making profit for someone else in any method other than the original artist's intention. It has the primary goal of preventing NFTs from being sold if they are stolen artwork, and easing the takedown process for victims of art theft.

## 4. Art Guardian Prototype Design Description

### 4.1 Architecture (Hardware/Software)

### 4.2 Features and Capabilities

### 4.3 Development Challenges

## 5. Glossary

- Art Platform - A website in which users can post their digital art
- Blockchain - An immutable ledger that anyone can validate
- DMCA (Digital Millennium Copyright Act) Takedown - A request sent by the owner of the copyrighted content to remove the infringing content from the internet or platform
- Minting - The process in which the files become part of the blockchain
- NFT Marketplace - An online platform in which NFTs are minted, sold, and collected
- NFT - Non Fungible Token
  - Non-fungible - Unique, indivisible, and irreplaceable
  - NFTs are a certificate of ownership stored on a blockchain that links to a file

## 6. References

Collins, B. (2021, December 23). Fungible vs Non-Fungible Tokens: What's The Difference?

Bryan Collins. <https://www.bryancollins.com/fungible-vs-non-fungible-tokens/>

Coincorner. (2022, February 11). What Is Nft Minting? Coin-Corner.

<https://coin-corner.com/what-is-nft-minting/>

Barber, R. (2022, March 18). *NFT statistics, Facts & Trends in 2022 [what are nfts?]*.

Cloudwards. Retrieved April 11, 2022, from

<https://www.cloudwards.net/nft-statistics/#:~:text=In%20late%202017%2C%20total%20NFT,30%2C000%20to%2080%2C000%20per%20week>

Beckett, L. (2022, January 29). 'Huge mess of theft and fraud:' artists sound alarm as NFT crime proliferates. The Guardian. Retrieved January 31, 2022, from <https://www.theguardian.com/global/2022/jan/29/huge-mess-of-theft-artists-sound-alarm-theft-nfts-proliferates>

Dailey, N. (2022, January 6). NFTs ballooned to a \$41 billion market in 2021 and are catching up to the total size of the global fine art market. Markets Insider. Retrieved February 23, 2022, from <https://markets.businessinsider.com/news/currencies/nft-market-41-billion-nearing-fine-art-market-size-2022-1>

Mr. DMCA Helper. (2022, February 23). What is a DMCA Takedown? Dmca.com. [https://www.dmca.com/FAQ/What-is-a-DMCA-Takedown?ref=why\\_is\\_sol5a32](https://www.dmca.com/FAQ/What-is-a-DMCA-Takedown?ref=why_is_sol5a32)

The Rise of Digital Art. ArtDiction. (2021, April 4). Retrieved April 11, 2022, from <https://www.artdictionmagazine.com/the-rise-of-digital-art/>