CS 411W Lab III

Prototype Test Plan

Team Blue

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1. Objectives

The document aims to introduce the Test Plan and its procedures to illustrate the approach, tests, and testing order to demonstrate the Art Guardian prototype is operational. Art Guardian is a web application that is accessible via a device with internet access. The contents in this document describe the plans and procedures used to verify a stable operational performance of the Art Guardian prototype.

2. References

Team Blue. (2022 October 12). Lab 1 – Art Guardian Product Description. Retrieved November 28, 2022, from https://www.cs.odu.edu/~411blue/labs.html. (2022 November 28).

Team Blue. Lab 2 – Art Guardian. Product Specification. Retrieved November 28, 2022, from https://www.cs.odu.edu/~411blue/labs.html. (2022 November 28).

3. Test Procedures

Section 3 of this document will define and explain each test case developed for the Art Guardian Prototype. Each test case will follow a set format of: test category, description, test case, case name, version, author, requirements fulfilled, purpose of the test, and setup requirements. This will then be followed by a detailed description of the tester's actions and the expected results for that action.

3.1. Database Setup (*O: Kidd*)

This test case is designed for the verification of the successful setup of the database for the final demonstration of the prototype. The database will be filled with sets of mock data for user information, art metadata information, DMCA information, and notifications information. There will be separate data tables that hold art, DMCA, user, and notifications and there will be three mock users, five mock art pieces, two mock DMCAs, and five mock notifications stored in

the database. Lambda functions and API gateways are used to connect the database tables to the Art Guardian prototype.

3.2. User Interface Test Category

3.2.1. Sign in/Sign-Up Page Tests *(O: Ihde, M1: Roberts)*

Test Category: User Interface	**Description:** Verifies that the sign in and sign up pages work correctly with the authentication system		
Test Case: 3.1.1	**Case Name:** Sign in/Sign-up page	**Version:** 1.0	**Written By:** Paolo Ihde
Requirements Fulfilled: 3.1.1.2 3.1.1.2.1 3.1.1.2.2	**Purpose:** Ensures that users can successfully sign in to accounts and register for new accounts.		
Setup Conditions: 1. Visit art guardian website 2. Click on either the sign in tab or sign-up tab			

Test Case Activity		**Pass/Fail**	**Comments**	**Expected Result**
1	Click on Sign-In tab			Panel at the center of the screen shows an email input box, password input box, and sign-in button.
2	Attempt sign-in with invalid credentials			“Incorrect email or password” text appears above sign-in button
3	Attempt sign-in with valid credentials			Signs user in and redirects user to landing page

4	Click on forgot password link			Redirects user to a page in which they can enter their email, and then a reset password link is sent to their email if their is an associated email with that account.
5	Click on Sign-up tab			Panel at center requests information for account creation such as first name, last name, email, phone number, and password. There is a submit button at the bottom of the panel
6	Attempt account creation without filling in all required information			Account creation does not occur, and missing information fields are highlighted in red.
7	Attempt account creation with all required information			Account creation occurs. Redirects users to an email confirmation page, which requires a code that is sent to their email.

3.2.2. Landing Page Tests *(O: Diaz)*

Test Category: User Interface	**Description:** This test ensures the correct rendering of the landing page		
Test Case: 3.1.2	**Case Name:** Landing Page	**Version:** 1.0	**Written By:** Carlo Diaz

Requirements Fulfilled: 3.1.1.3.1 3.1.1.3.2	**Purpose:** To ensure the landing page renders the correct information pertaining to the user

Setup Conditions:

1. Log in to Art Guardian

Test Case Activity		**Pass/Fail**	**Comments**	**Expected Result**
1	View user information			The user's full name must appear correctly in the form "Hello <first name> <last name>"
2	View number of notifications			The number of notifications/alerts pertaining to the user's art must appear in the form "You have <number of notifications> notifications"
3	Click notifications button			If there are notifications available, there will be a "click here" link that redirects the user to the notifications page
4	View general art protection guidelines			Upon scrolling further down, the art protection guidelines shall appear with a darker blue background

3.2.3. Navigation Bar Tests *(O: Diaz, M1:Roberts)*

Test Category: User Interface	**Description:** This test verifies that the navigation bar works as intended, with each menu button directing the user to its respective page.		
Test Case: 3.1.3	**Case Name:** Navigation Bar	**Version:** 1.0	**Written By:** Carlo Diaz
Requirements Fulfilled: 3.1.1.1	**Purpose:** To ensure the navigation bar buttons correctly displays buttons and redirects the user to the landing/home page, user art gallery/upload page, notifications page, and settings page.		
Setup Conditions: 1. Log in to Art Guardian with an authenticated account			

Test Case Activity		**Pass/Fail**	**Comments**	**Expected Result**
1	Click on home button			User is directed to the landing/home page and navigation bar is present on top of page
2	Hover over profile button			Dropdown menu appears that leads to art upload or art gallery and navigation bar is present on top of page
3	Click on art upload button			User is directed to the art upload page and navigation bar is present on top of page
4	Click on art gallery button			User is directed to the art gallery page and navigation bar is present on top of page
5	Click on			User is directed to the

	notifications button			notifications page and navigation bar is present on top of page
6	Click on settings button			User is directed to the settings page and navigation bar is present on top of page

3.2.4. User Art Gallery/Art Upload Page Tests (*O: Roberts)*

Test Category: User Interface	**Description:** This test verifies that the Art Upload function of the Art upload/gallery page works properly.		
Test Case: 3.1.4.1	**Case Name:** Art Upload	**Version:** 1.0	**Written By:** Autumn Roberts
Requirements Fulfilled: 3.1.1.4 3.1.1.5	**Purpose:** To ensure the user can upload art to the Art Guardian database.		

Setup Conditions:
1. Log in to Art Guardian with an authenticated account
2. Navigate to Art Upload/Gallery page

Test Case Activity		**Pass/Fail**	**Comments**	**Expected Result**
1	Click on File Select button			File window appears on user desktop
2	Navigate to and select desired artwork then press open.			Art is uploaded to the database
3	Database is updated and page			User's art is displayed in the gallery

	refreshed			

3.2.5. Art Gallery Test (*O: Roberts*)

Test Category: User Interface	**Description:** This test verifies that the art gallery function of the art upload page works as intended		
Test Case: 3.1.4.2	**Case Name:** Art Gallery	**Version:** 1.0	**Written By:** Autumn Roberts
Requirements Fulfilled: 3.1.1.5.2	**Purpose:** To ensure the gallery displays user art and allows users to edit art information.		

Setup Conditions:

1. Log in to Art Guardian with an authenticated account
2. Navigate to Art Upload/Gallery page

Test Case Activity		**Pass/Fail**	**Comments**	**Expected Result**
1	Page Loads Properly			User's Uploaded Art is displayed
2	Click on Artwork			User is displayed information about the art.
3	Click on edit button			User can edit art name, whitelist status, and tokenID
4	Click on Submit button on edit form			Art information is uploaded to database and is saved,
5	Exit menu then click on the artwork again			Edited information from the previous step will appear in form.

6	Click on delete button			Art is deleted from gallery and is no longer displayed

3.2.6. Notifications Page Tests *(O: Ihde, M1:Roberts)*

Test Category: User Interface	**Description:** This test verifies that the notification page displays the correct alerts to users.		
Test Case: 3.1.5	**Case Name:** Notifications Page	**Version:** 1.0	**Written By:** Paolo Ihde
Requirements Fulfilled: 3.1.1.6.1 3.1.1.3.1.1 3.1.1.3.1.2	**Purpose:** To test that the notifications page displays correct and timely alerts based on the detection of users' art in the NFT marketplace		
Setup Conditions: 1. Log in to Art Guardian 2. Click on notifications page in navigation bar 3. False positive search results are created to generate notifications			

Test Case Activity		**Pass/Fail**	**Comments**	**Expected Result**
1	Empty notification page			Notification page should display no notifications available
2	Notifications page with one or multiple new notifications			The notification icon in the navigation bar should have a red dot next to it. Notifications on the page are displayed in an infinitely

				scrollable, vertical list
3	Content of an alert			Contains a preview of the stolen art. States that the user's art has been found on the NFT marketplace. Contains a link to the art confirmation page and a link to the NFT marketplace
4	Click on art confirmation page link			Redirects user to art confirmation page
5	Click on NFT link			Redirects user in a new tab to the listing of their art on the NFT marketplace

3.2.7. User Art Confirmation Page Tests *(O: Ihde)*

Test Category: User Interface	**Description:** This test verifies the art confirmation page provides the correct information concerning the infringing NFT, and provides the users the ability to confirm it		
Test Case: 3.1.6	**Case Name:** Art Confirmation Page	**Version:** 1.0	**Written By:** Paolo Ihde
Requirements Fulfilled: 3.1.1.6.2 3.1.1.6.2.1 3.1.1.6.2.2	**Purpose:** The art confirmation page allows users to verify that the art detected on the NFT marketplace is infringing on their artwork.		
Setup Conditions: 1. Log in to Art Guardian			

2. Navigate to notifications page from navigation bar
3. Click on “Click here for more information” link, which is part of an alert.

Test Case Activity		**Pass/Fail**	**Comments**	**Expected Result**
1	Click on link from alert to art confirmation page			Redirects the user to art confirmation page. The art confirmation page contains NFT information and a preview of it on the left side. One checkbox asks the user to verify that they are the original creator of this work. Another checkbox verifies that the user wishes to requests a takedown request for this NFT
2	One or both checkboxes are unchecked			Continue button is grayed out, and user cannot proceed with DMCA process.
3	Both checkboxes are checked			Continue turns blue and is now clickable by user
4	Clicks on continue button			Redirects user to DMCA takedown request page for corresponding artwork

3.2.8. DMCA Takedown Request Page Tests *(O: Diaz)*

Test Category: User Interface	**Description:** This test verifies the functionality and correctness of information of the DMCA takedown request page		
Test Case: 3.1.7	**Case Name:** DMCA Takedown Request	**Version:** 1.0	**Written By:** Carlo Diaz
Requirements Fulfilled: 3.1.1.7 3.1.1.7.1 3.1.1.7.2	**Purpose:** To ensure the DMCA takedown request page appears correctly, and that the user may not submit the takedown request unless an e-signature is provided		

Setup Conditions:

1. Log in to Art Guardian
2. User must have a piece of artwork that has been detected on the NFT marketplace
3. Confirm the art in the user art confirmation page

Test Case Activity		**Pass/Fail**	**Comments**	**Expected Result**
1	Scroll through the scroll view of DMCA takedown request text			The text must contain the correct information of the NFT and must be contained within the scroll view
2	Hover over disabled “submit” button		Must NOT have an e-signature provided yet	Clicking will not be allowed, and the cursor will turn into an “error” symbol
3	Draw signature in e-signature field			The user’s signature will be drawn in the field. The submit button will now be clickable

4	Click the “clear” button			The user’s signature will be erased and the submit button is disabled
5	Click the submit button		E-signature MUST be provided	On hover, the cursor will turn into a pointer and the user will be able to click the button to submit the takedown request

3.2.9. User Settings Page Tests *(O:Ihde)*

Test Category: User Interface	**Description:** Verifies that the user can alter their account information from the options within the settings page.		
Test Case: 3.1.8	**Case Name:** Settings Page	**Version:** 1.0	**Written By:** Paolo Ihde
Requirements Fulfilled: 3.1.1.5.1 3.1.1.8 3.1.1.8.1 3.1.1.8.2	**Purpose:** Allows users to change account and security settings.		
Setup Conditions: 1. Log in to Art Guardian 2. Click on settings icon			

Test Case Activity		**Pass/Fail**	**Comments**	**Expected Result**
1	Click on settings icon in navigation bar			Redirects user to settings page, which contains two side tabs. One tab is for account

				settings. The other tab is for security settings
2	Click on account settings tab			Brings user to account settings page.
3	Click on change profile information in account settings tab			Brings up a pop up window which allows users to edit their, first name, last name, email, and phone number
4	Click on add art account in account settings tab			Brings up a pop up window which displays sign-in links through several social media art platforms
5	Click on delete art account in account settings tab			Creates a pop up window asking the user if they are sure they want to remove the associated account
6	Click on reset password button in account settings tab			A pop up window appears which asks the user to confirm that they want to reset their password. If they select yes, then a password reset link is set to their email.
7	Click on security settings tab			Brings user to account security settings.
8	Click on enable two-factor authentication button			Asks the user if they are sure they want to enable two-factor authentication. If they select yes, then they

				will be prompted to use their phone number or alternative email address, which a code will be sent to for two-factor authentication.

3.3. Algorithms Test Category

3.3.1. Whitelisting (*O: Zheng*, *M1: Thompson*)

Test Category: Algorithms		**Description:** Verifies that images within a user's library can be whitelisted from Art Detection.		
Test Case: 3.2.1		**Case Name:** Whitelisting	**Version:** 1.0	**Written By:** Tobin Zheng
Requirements Fulfilled: 3.1.2.1		**Purpose:** To ensure that NFTs minted by users will be ignored by Art Detection.		
Setup Conditions: 1. Obtain the credentials for an Art Guardian account. 2. Log in to the Art Guardian web application. 3. Upload a new image if there are no images associated with the account.				
Test Case Activity		**Pass/Fail**	**Comments**	**Expected Result**
1	Click on the Whitelist button for a selected image.			Users are prompted to enter the Token ID of the NFT to be whitelisted.
2	Click on the Unwhitelist button for a selected image.			The Token ID assigned is deleted.

3.3.2. **Art Detection** (*O: Zheng, M1: Thompson*)

Test Category: Algorithms	**Description:** This test will validate whether the Art Detection algorithms are able to search for and return counterfeit NFTs correctly.		
Test Case: 3.2.2	**Case Name:** Art Detection	**Version:** 1.0	**Written By:** Tobin Zheng
Requirements Fulfilled: 3.1.2.2 3.1.2.2.1 3.1.2.3.1	**Purpose:** To ensure that marketplaces can be monitored for counterfeit NFTs based on user uploaded artwork.		
Setup Conditions: 1. Art detection algorithms are constructed.			

Test Case Activity		**Pass/Fail**	**Comments**	**Expected Result**
1	A marketplace search is initiated for a piece of artwork that was uploaded, or periodically triggered.			If results were found, then Art Detection will return metadata regarding the associated counterfeit NFTs, including images.

2	The result returned by the marketplace search is whitelisted.			The image matcher will not be initiated.
3	The result returned by the marketplace search is not whitelisted.			The image matcher will be initiated, and metadata regarding the associated counterfeit NFT and images will be sent.

3.3.3. **Image Matcher** (*O: Thompson*, *M1: Zheng*)

Test Category: Algorithms	**Description:** This test will verify that the image matcher can detect that counterfeit NFTs match the user uploaded artwork.		
Test Case: 3.2.3	**Case Name:** Image Matcher	**Version:** 1.0	**Written By:** Michael Thompson
Requirements Fulfilled: 3.1.2.4	**Purpose:** To ensure that the image matcher correctly verifies that images embedded within counterfeit NFT results match the associated artwork uploaded by the user.		
Setup Conditions: 1. Image Matcher is invoked by Art Detection.			

Test Case Activity		**Pass/Fail**	**Comments**	**Expected Result**
1	The image matcher does not verify that a counterfeit NFT			No confirmation notification will be sent to the user.

	and the uploaded artwork are the same.			
2	The image matcher verifies that a counterfeit NFT and the uploaded artwork are the same.			A confirmation notification containing metadata of the NFT and its image will be sent to the notifications page.
3	The image matcher verifies that multiple counterfeit NFTs are the same as the uploaded artwork.			Each verified match will have a confirmation notification containing metadata of the respective counterfeit NFT. These notifications will sent to the notifications page.

3.3.4. DMCA Generator (*O: Zheng, M1: Thompson*)

Test Category: Algorithms	**Description:** This test will verify if the DMCA Generator creates valid DMCA takedown notices.		
Test Case: 3.2.4	**Case Name:** DMCA Generator	**Version:** 1.0	**Written By:** Tobin Zheng
Requirements Fulfilled: 3.1.3.1	**Purpose:** To ensure that the DMCA generator correctly generates DMCA takedown requests based on counterfeit NFT metadata and other identifying information.		

Setup Conditions: 1. The image matcher confirms a match between a counterfeit NFT and user uploaded artwork.				
Test Case Activity		**Pass/Fail**	**Comments**	**Expected Result**
1	The user confirms within the notification that the counterfeit NFT matches their artwork.			A DMCA takedown request will be fully generated based on: contact information, description of the counterfeit NFT, legally binding statements, and authorized signature.
2	The user does not confirm within the notification that the counterfeit NFT matches their artwork.			A DMCA takedown request will not be generated.

3.3.5. **DMCA Filing** (*O: Zheng, M1: Thompson*)

Test Category: Algorithms	**Description:** This test will verify if the DMCA Filing algorithm sends DMCA takedown notices via the Gmail API.		
Test Case: 3.2.5	**Case Name:** DMCA Filing	**Version:** 1.0	**Written By:** Tobin Zheng
Requirements Fulfilled: 3.1.3.2	**Purpose:** To ensure that the Gmail API and subsequent filing procedures work correctly when issuing DMCA takedown requests.		
Setup Conditions: 1. A DMCA takedown request was generated through the DMCA Generator. 2. Create and initialize a test Gmail address. 3. Send a notification to the user for each generated takedown requiring a digital			

signature verifying that legal responsibility is held on the user.				
Test Case Activity		**Pass/Fail**	**Comments**	**Expected Result**
1	The user submits a digital signature.			The DMCA takedown request will be sent to the test Gmail address using the Gmail API.
2	The user does not submit a digital signature.			The DMCA filer will remain idle until a digital signature is submitted by the user. If a signature is not submitted after 30 days, reminders will be issued to the user on the notifications page every six days.

3.3.6. **DMCA Cataloging** (*O: Zheng, M1: Thompson, M2: Roberts*)

Test Category: Algorithms	**Description:** This test will verify if the DMCA Cataloging algorithm accurately lists all DMCAs and their status.		
Test Case: 3.2.6	**Case Name:** DMCA Cataloging	**Version:** 1.0	**Written By:** Tobin Zheng
Requirements Fulfilled: 3.1.3.3	**Purpose:** To ensure that the all filed DMCAs are correctly cataloged.		
Setup Conditions: 1. A DMCA takedown request has been filed. 2. Navigate to the DMCA Catalog page.			
Test Case Activity	**Pass/Fail**	**Comments**	**Expected Result**

1	DMCA Catalog Page loads properly.			All DMCAs will be visible on the DMCA catalog page.
2	Select a DMCA			Menu with DMCA information such as date filed, completion status, artwork stolen, and NFT information as well as an ignore button will pop up.
3	User Selects to ignore a DMCA			DMCA will no longer appear in the DMCA catalog page.

4. Traceability to Requirements (*O: Thompson, M1: Ihde, M2: Diaz*)

		Test Case														
Requirements		3.1.1	3.1.2	3.1.3	3.1.4.1	3.1.4.2	3.1.5	3.1.6	3.1.7	3.1.8	3.2.1	3.2.2	3.2.3	3.2.4	3.2.5	3.2.6
Navigation Bar	3.1.1.1			■												
Account Creation	3.1.1.2	■														
Sign-In	3.1.1.2.1	■														
Registration	3.1.1.2.2	■														
Updates	3.1.1.3.1		■													
Guidelines	3.1.1.3.2		■													
Art Upload	3.1.1.4				■											
Profile	3.1.1.5.1									■						
Gallery View	3.1.1.5.2					■										
Alerts	3.1.1.6.1						■									
Information Link	3.1.1.6.1.1						■									
NFT Link	3.1.1.6.1.2						■									
Art Confirmation	3.1.1.6.2							■								
NFT Preview	3.1.1.6.2.1							■								
Check Boxes	3.1.1.6.2.2							■								
DMCA Takedown Request Preview	3.1.1.7.1								■							
E-Signature	3.1.1.7.2								■							
Settings	3.1.1.8									■						
Account Information	3.1.1.8.1									■						
Security Settings	3.1.1.8.2									■						
Whitelisting	3.1.2.1										■					
Marketplace Monitoring	3.1.2.2											■				
Image Batch Searcher	3.1.2.2.1											■				
Image Matcher	3.1.2.3												■			
DMCA Generation	3.1.3.1													■		
DMCA Filing	3.1.3.2														■	
DMCA Cataloging	3.1.3.3															■