Reimagining the Past: Harnessing Generative AI to Explore and Restore Cultural Heritage

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Introduction

The driving force behind this project stems from my interest and passion for preserving historical sites in my homeland, Armenia. However, the widespread destruction of such sites and artifacts is not exclusive to Armenia; it is a pervasive issue across much of the Middle East, particularly in the past few decades. This interest in preservation and protection evolved into a focus on recreation and restoration, making artificial intelligence an ideal tool for the task. The goal of this project is to recreate lost artwork and architecture, while simultaneously advocating for the protection of the remaining heritage sites. By leveraging the power of AI, we aim to bring attention to these important cultural treasures and inspire collaborative efforts to conserve them for future generations.

Exhibition

This exhibition, developed as part of the senior seminar in the Integrated Program for Humane Studies, aims to explore the extensive damage inflicted upon cultural heritage sites in the Middle East, as well as the lost buildings of the ancient world. By compiling information on the architectural and artistic destruction, the project highlights the significance of preserving these invaluable treasures. Utilizing Midjourney's text-to-image generation technology, the exhibition endeavors to reimagine these sites not only before their destruction but also at the peak of their splendor. Although the AI-rendered images are not historically accurate and may contain inaccuracies, they offer valuable insights into the rich heritage of these ancient civilizations.

In addition, the exhibition features slides from the Baly Slide Collection of the Iraq Museum in Baghdad, showcasing objects from the museum's collection that were later destroyed or damaged. These rare images provide a unique glimpse into a bygone era. The exhibition also includes objects from the Kenyon College Art History Department collection that exemplify the illegal export of cultural items from around the world, shedding light on the extent of damage to individual pieces.

The exhibition was on view in the Meier-Draudt Curatorial Classroom at the Gund Gallery at Kenyon College from April 24 to April 29, 2023.

Storymaps

This ArcGIS Storymaps helps tell the story specifically of cultural destruction in the Middle East. There is an interactive map showing sites of damage, images showing the before and after of the destruction of architectural sites, and stories of lootings and destruction of museums and particular items. Please scan the QR code to see more.

Midjourney and Prompt Engineering

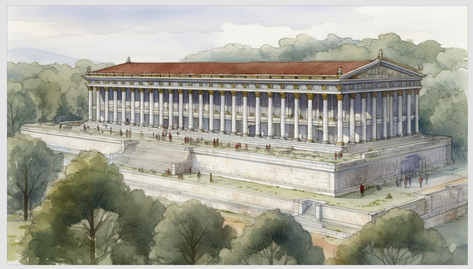
Midjourney is a text to image art generation tool created in 2022 that can be utilized on the Discord server. Midjourney technology uses a new form of artificial intelligence: diffusion models. These models are trained on millions of images scraped from the internet, it learns the relationship between existing text and images, as well as learning to infer conceptual information about the world. Once they have been trained on all of that data, it creates a low resolution image, then continues to regenerate and add details to the image until you receive a final result. You can see this in action when you prompt Midjourney's Discord server. Unless the models are completely overfit, they are not modifying what already exists, but creating something completely new based on the words that you have given it. Creating a building on what the model understands to be a building,

I wanted to see what Midjourney could therefore do when asked to recreate lost or damaged cultural sites at the height of their splendor. Because of its nature as a diffusion model, I knew it was not going to create a perfectly accurate piece, but I was still able to generate compelling illustrations not seen very often in a matter of minutes. Open AI's GPT-4 model has made huge strides in its ability as a large language model, and it was much better than most humans to understand the best wording to talk to Midjourney with. The choice of words and specifications for sizes and mediums is key to getting the image you want. This further streamlines the process of creating compelling and high quality images in minutes.

One of the frustrations of working with Midjourney was the inability of the AI to edit to your liking. My original goal for generating pieces was to create photorealistic scenes that were able take a viewer back in time to these ancient sites. However, when ever I would prompt it for a photorealistic image of the Library of Alexandria, it overfit too much and instead continued to generate photo like images of modern day libraries. Perhaps it is a failure in my prompt generation, but I do think this has been a limitation to some of my work.

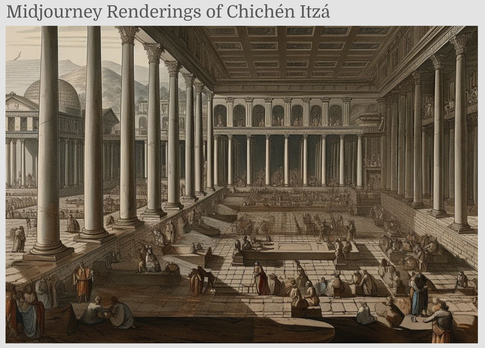
Midjourney Results

Midjourney Rendering of the City of Petra



Midjourney Rendering of The Temple of Artemis

Midjourney Renderings of Chichén Itzá



Midjourney Renderings of The Library of Alexandria

AI Restoration's Future

Digital preservation of historical sites through AI-generated renderings is an emerging field that holds great promise. The renderings I created in collaboration with Midjourney, although not perfectly historically accurate, tell a small fraction of the story of the work being done to bridge the gap between technology and history.

One notable example of this technology in action is Microsoft's work on rebuilding cultural sites using AI through their project, "Ancient Olympia: Common Grounds," which is a part of their AI for Cultural Heritage initiative. They took hundreds of thousands of images at the site, and the AI was able to render a model that is close to photorealistic. This impressive achievement underscores the collaborative effort required from scholars, anthropologists, and photographers and captures the intricate details and adheres to historical context, Microsoft's work helps increase public awareness and accessibility of these sites.

As AI technologies continue to evolve, it is expected that digital preservation methods will become more accessible and efficient for sites across the globe.Recent advancements in text-to-image generation technology, like Midjourney, will likely be a part of this.

In conclusion, the integration of AI and digital preservation is reshaping how we approach the preservation of historical sites. These advancements hold the potential to significantly enhance the accuracy, accessibility, and efficiency of preserving cultural heritage for future generations to explore and appreciate.

Acknowledgements and Sources

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