Using Image Detection to Address Potential Bias in Artifact Descriptions

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Problem Space

- From our previous research on debiasing textual descriptions using BERT, we identified significant inefficiencies in manually inspecting text descriptions and cross-verifying images from the museum website.
- To address these challenges, we aim to harness the power of image detection to further automate and streamline the debiasing process.

Limitations

- Accurate image recognition with regard to artist, genre, and background details.
- Limited viewing angles.
- Challenges in visualizing biases.
- Insufficient training resources for GPT to match curators' expertise.
- Complexity in defining and measuring bias.

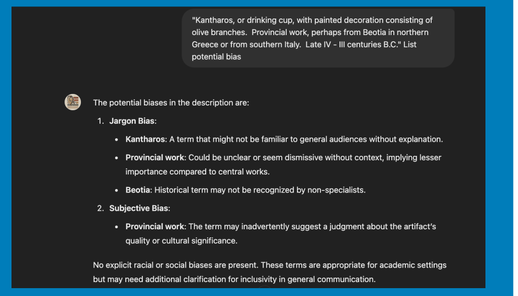
Project Methodology

Research
- Experimented with multiple existing tools including
  - Microsoft Azure, ,GPT, IBM Watson, Google Cloud Vision, Clarifai, DALLLE, Adobe Sensei, and others.

Web Scraping
- Object ID <--> Artifact Description
- Media ID <--> Museum Website image
  - Object ID <--> Media ID
  - Description <--> Image
- Optimized the image extraction process for efficiency and accuracy.

Deployment / Fine-tuning
- Prompt Engineering & Prompt chaining
- Uploaded annotated textual training data
- Included bias metrics, instructions, related readings, news, among others

Sample
Object 246
Kantharos



Scan to test our Artifact Description Reviewer !

Project Outcomes

- Discovered limitations in existing tools when processing and analyzing image and text data simultaneously.
- Finished a working web scraping code file that is capable of scraping almost all images from the website, including different angles of the same artifact, and bypassing collection images(>5).
- Implemented a ChatGPT AI Custom Chatbot to enable user-friendly application and leverage advanced image processing capabilities.

Future Directions

- Further fine-tuning efforts include:
  - Continuously refining the model, as additional fine-tuning generally improves performance.
  - Collaborating with curators to draft sample responses, enabling the chatbot to better interpret and present image information.
- Exploring more flexible models, such as LLAMA or Hugging Face, to enhance adaptability and performance.
- Narrowing the scope to a specific time period, genre, or bias type to improve the model's precision and focus.