At the intersection of AI and Humanities: bridging the gap between the *digitally obliged* and the *digitally curious*
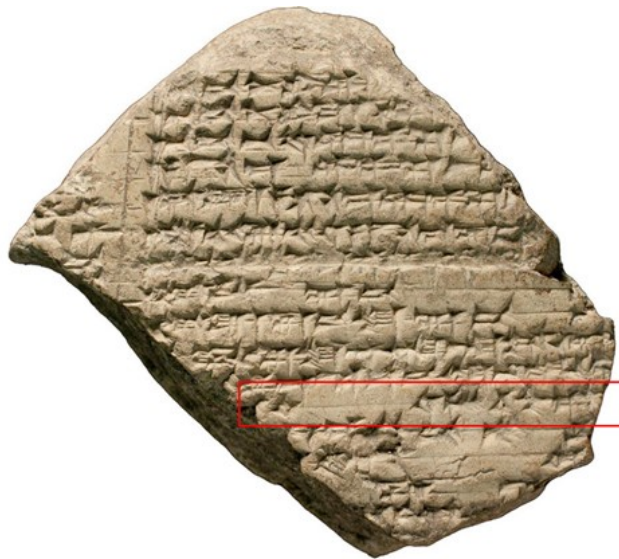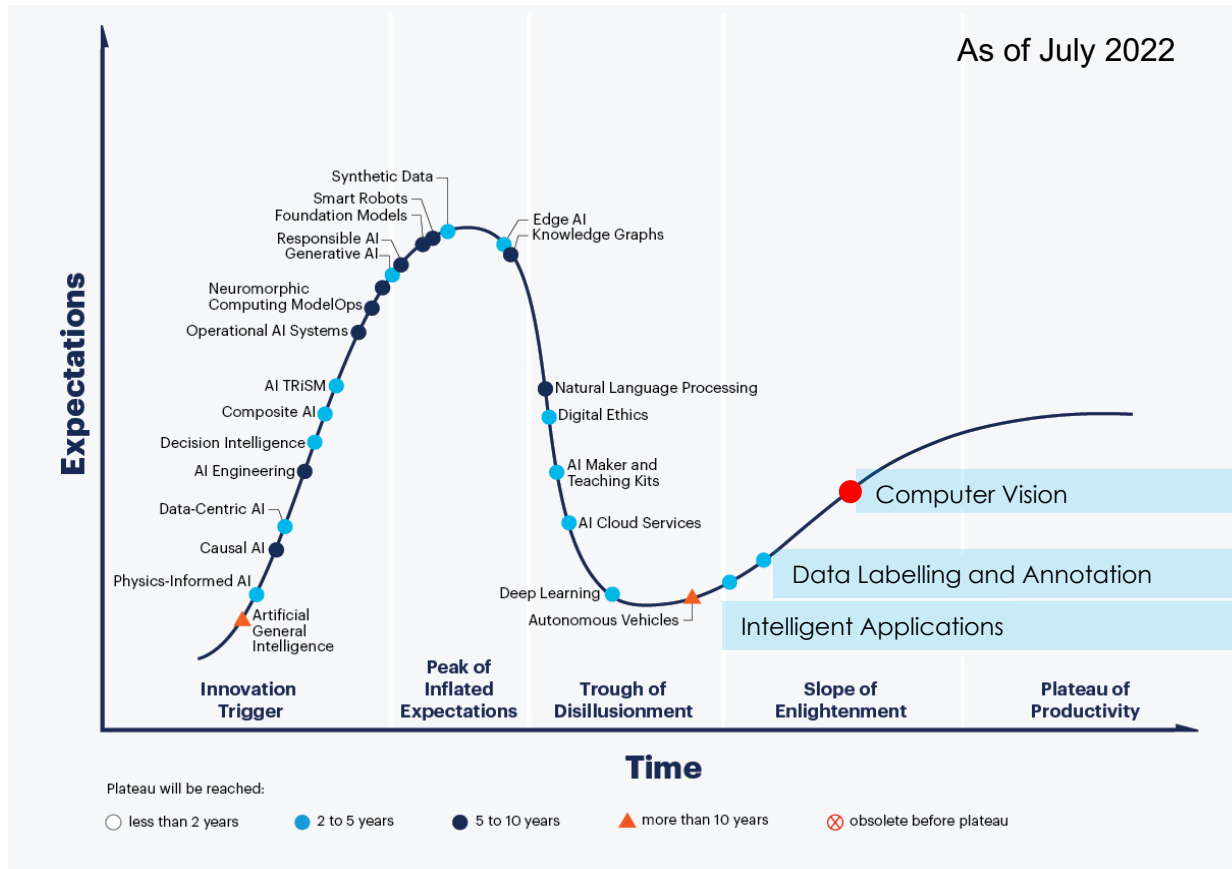

Cuneiform: [⟨cuneiform signs⟩]
Transliteration: [DIŠ TÚG-*su*] ⸢DADAG⸣ U₄-MEŠ-*šú* GÍD.DA-[MEŠ]
Translation: If he cleans his garments, his days will be long

Alberto del Bimbo
Università di Firenze
NEMECH New Media for Cultural Heritage Competence Center
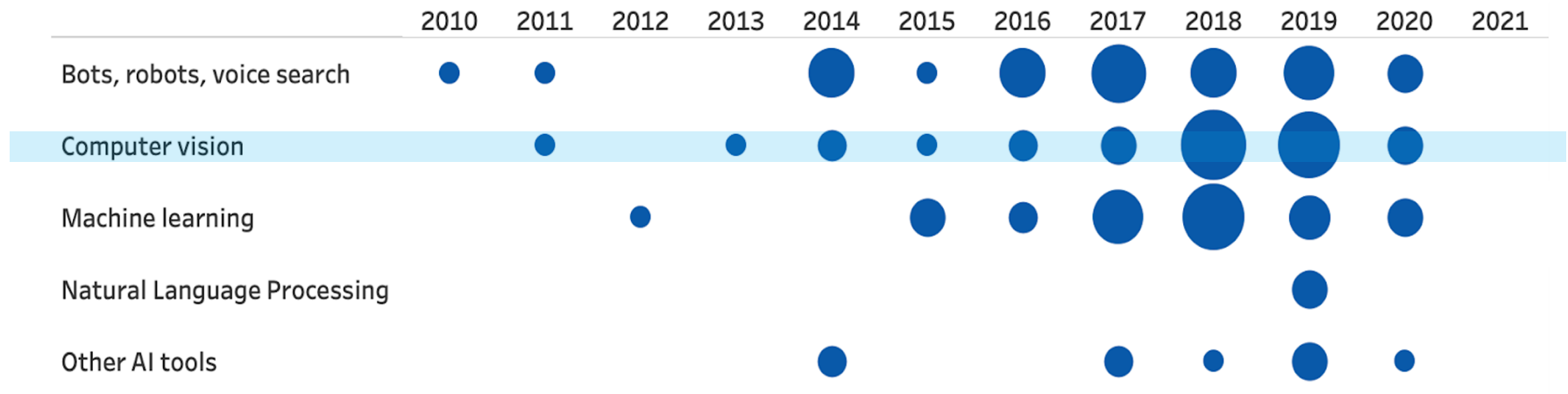
Hype cycle for Artificial Intelligence

As of July 2022

Computer Vision is the field where most AI research is being conducted.

Credit Gartner

Computer Vision is currently past the highest peak on the *slope of enlightenment* preparing to reach *platea productivity* where mainstream adoptions will start to take off.

AI initiatives in museums

Museums are utilizing AI technology mainly to engage audiences and personalize visitor experiences.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Bots, robots, voice search	●	●			●	●	●	●	●	●	●	
Computer vision		●		●	●	●	●	●	●	●	●	
Machine learning			●			●	●	●	●	●	●	
Natural Language Processing										●		
Other AI tools					●			●	●	●	●	

Credit E. Villaespesa, 2021

When it comes to museums
AI can be incorporated across the spectrum
from visitor experience to behind the scenes
and the technology can and has come in many forms.

Lauren Styx MuseumNext

The digitally obliged

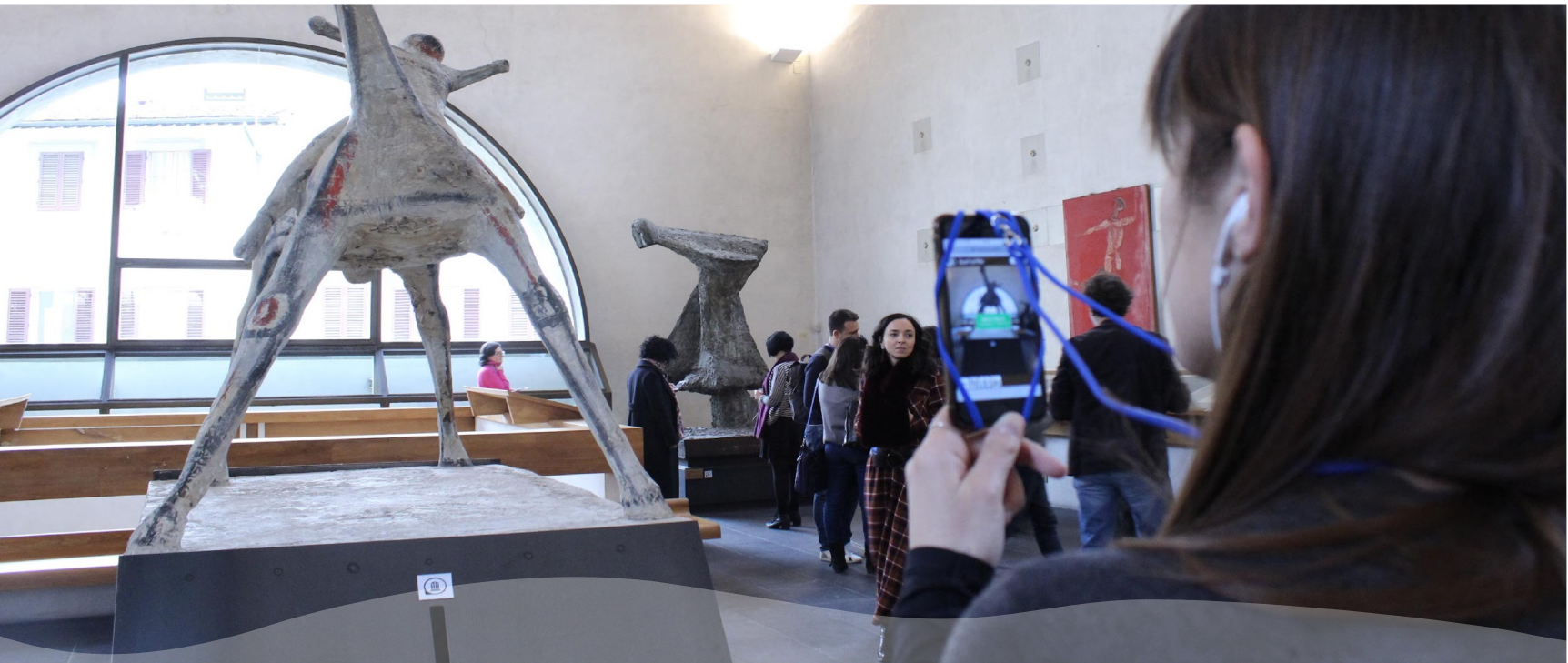AI Deep Learning benefits from a large collection of annotated data.

Applications on cultural heritage suffer from scarcity of data, use domain-specific jargon and underrepresented visual concepts

From Wikipedia

The Cardsharps, with its mixture of brutal low-life realism and luminous Venetian delicacy, was much admired, and Orsi "went around acclaiming Caravaggio's new style and heightening the reputation of his work."»... Caravaggio appears to have produced more than one version of the work. Over fifty copies and variants made by other painters have survived.....

The digitally curious

Computer Vision and Artificial Intelligence offer opportunities in terms of creating new user-friendly vocabularies, generating new data to interact and access the collection.

Automatic image captioning

GT	Madonna of parturition is an iconic depiction of the virgin mary shown as pregnant, which was developed mainly in tuscany in the 14th century. The madonna was portrayed standing, alone, often with a closed book on her belly, an allusion to the incarnate word...
zero-shot	Painting of three people
w/o DA	The painting depicts the virgin mary standing in front of a throne decorated with a red velvet curtain
w/ DA	It shows the virgin mary holding the child in a blue dress. she is dressed in a blue robe, and holds a book in her left hand. she wears a blue robe, and holds in her right hand. she wears a blue dress with a red bodice decorated with gold embroidery on the front, and a red cloth over her head. she wears a blue dress, and a gold brocade with a gold embroidery on her lap

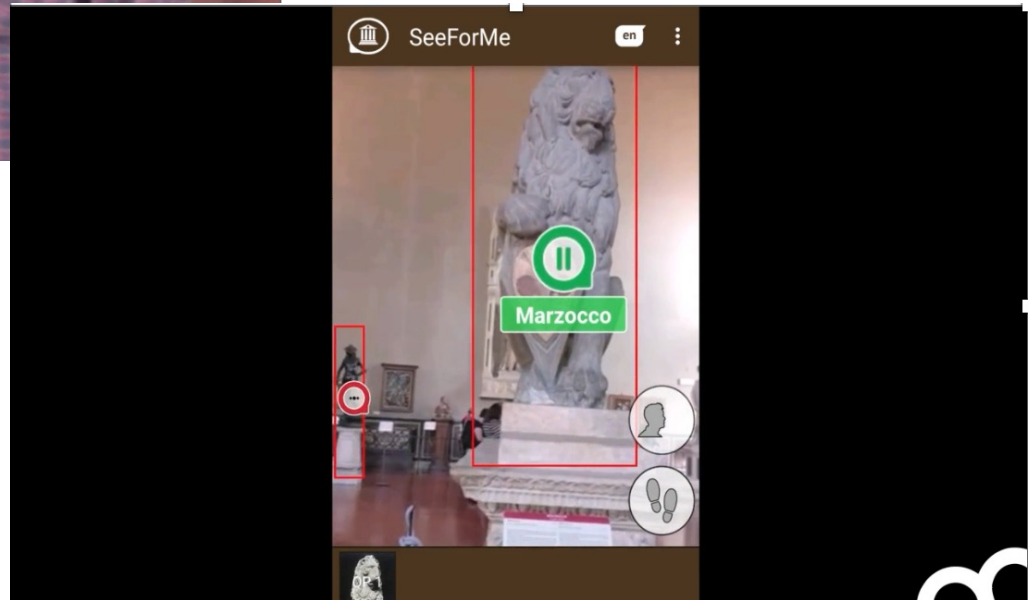|	
GT	Housed in the museum of fine arts, boston, it shows luke the evangelist, patron saint of artists, sketching the virgin mary as she nurses the child jesus. the figures are positioned in a bourgeois interior which leads out towards a courtyard, river, town and landscape…
zero-shot	A painting of a scene
w/o DA	A little girl and a boy, with a heart in the background
w/ DA	The painting depicts the virgin mary and the saint mary in the foreground, with a view of the landscape, and a woman holding a child

Generate text for vision and language tasks:

Image Captioning and Image Retrieval

Intelligent Vision for museum visits

Credit C. Baecchi 2018

Wearable computing: a companion for museum visits using computer vision for recognition of artworks and on-board sensors

Seeking multimodality and direct interactivity

Rather than just passively reading posted information or listening pre-defined texts, visitors can actively engage through hands-on experiences or dialogue.
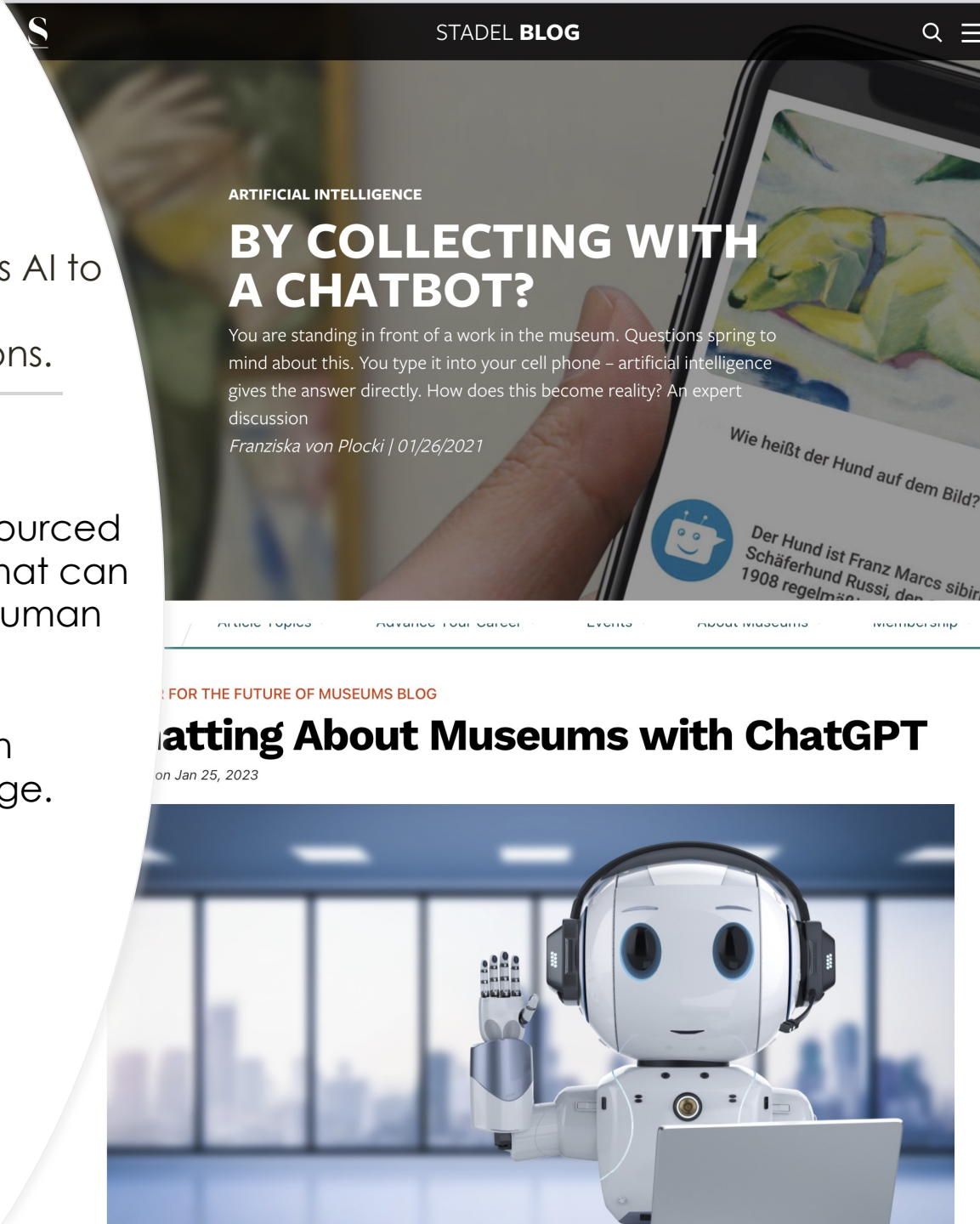
Large interactive surfaces

In the era of LLMs

Visual Question & Answering exploits AI to perform speech to text translation providing answers to visitor's questions.

Microsoft Research recently open-sourced Visual ChatGPT, a chatbot system that can manipulate images in response to human textual prompts.

GPT4 will be soon available that can answer questions based on the image.

ARTIFICIAL INTELLIGENCE

BY COLLECTING WITH A CHATBOT?

You are standing in front of a work in the museum. Questions spring to mind about this. You type it into your cell phone – artificial intelligence gives the answer directly. How does this become reality? An expert discussion
Franziska von Plocki | 01/26/2021

Wie heißt der Hund auf dem Bild?

Der Hund ist Franz Marcs sibir Schäferhund Russi, den 1908 regelmä

Article Topics   Advance Your Career   Events   About Museums   Membership

FOR THE FUTURE OF MUSEUMS BLOG

atting About Museums with ChatGPT

on Jan 25, 2023

Features of Chat GPT4

User   What is unusual about this image?

Credits Barnorama

GPT-4   The unusual thing about this image is that a man is ironing clothes on an ironing board attached to the roof of a moving taxi.

Conversational abilities
Can analyze and classify text
Can create websites

Can respond to natural language queries
Can answer trivial questions
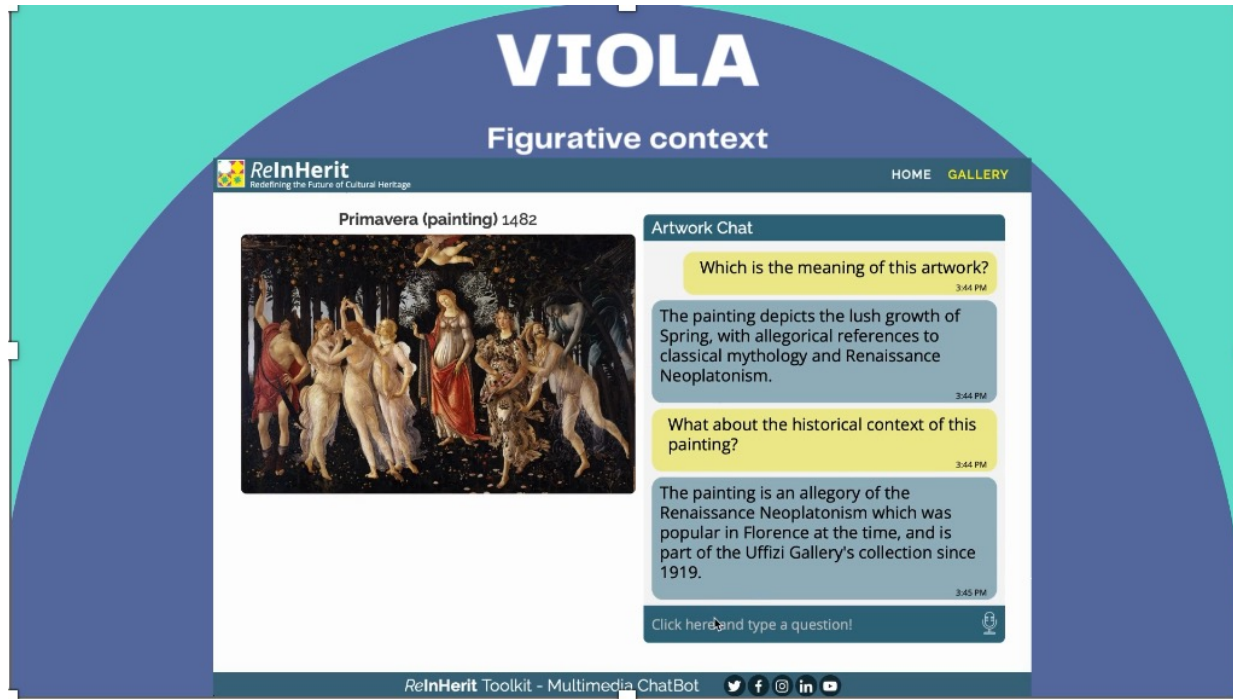Can provide language translations

Can describe images In detail
Can answer questions based on the image *

* Not yet available in the plus version of ChatGPT
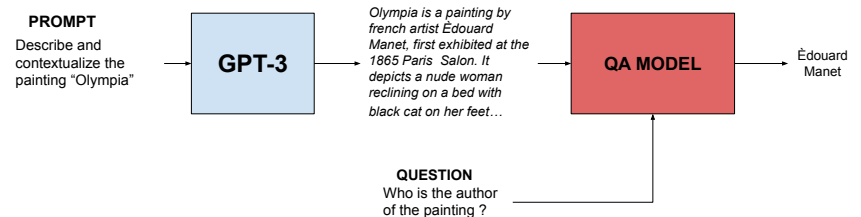   Only possible in GPT-4 API, waitlist to join

Chatbot for artworks

Reinherit project

A chatbot system that output answers to questions about images exploiting text generated by GPT3 constrained on the artwork description.
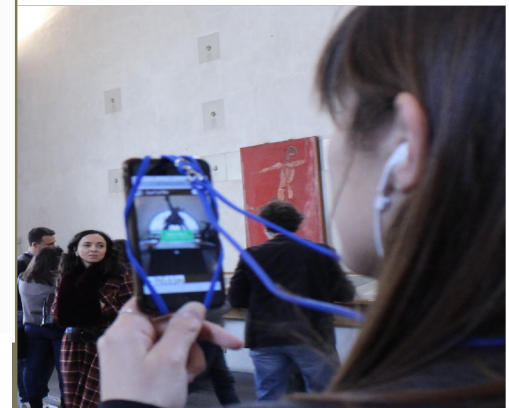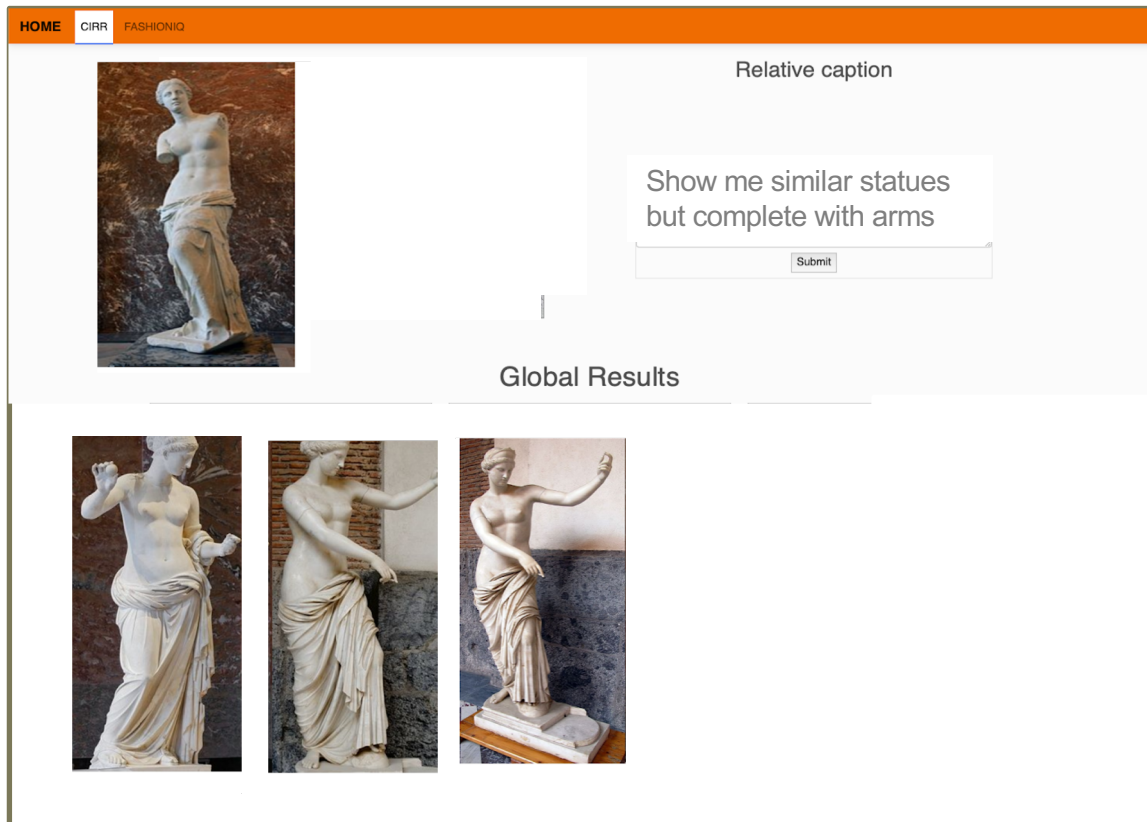

Credit A. Baldrati 2023

Conditioned image retrieval

Conditioned image retrieval:
find the best matching images satisfying both the similarity
constraints of the reference image and the changes to the
image requested in the additional text.

Challenges with AI in museums

Gender and cultural biases
> *This suit of armor from Japan was mistaken as Buddha by machine vision services. A pattern of conflating non-Western cultures.*

Sensitivity and accuracy
> *Risk to display information that is not completely accurate. Genaritive AI provides allucinations*

User acceptance
> Acceptance contingent upon the visitor's profile characteristics.

Distraction
> Visitors might focus too much on mobile phones and end up ignoring the details shown on the objects.

…….