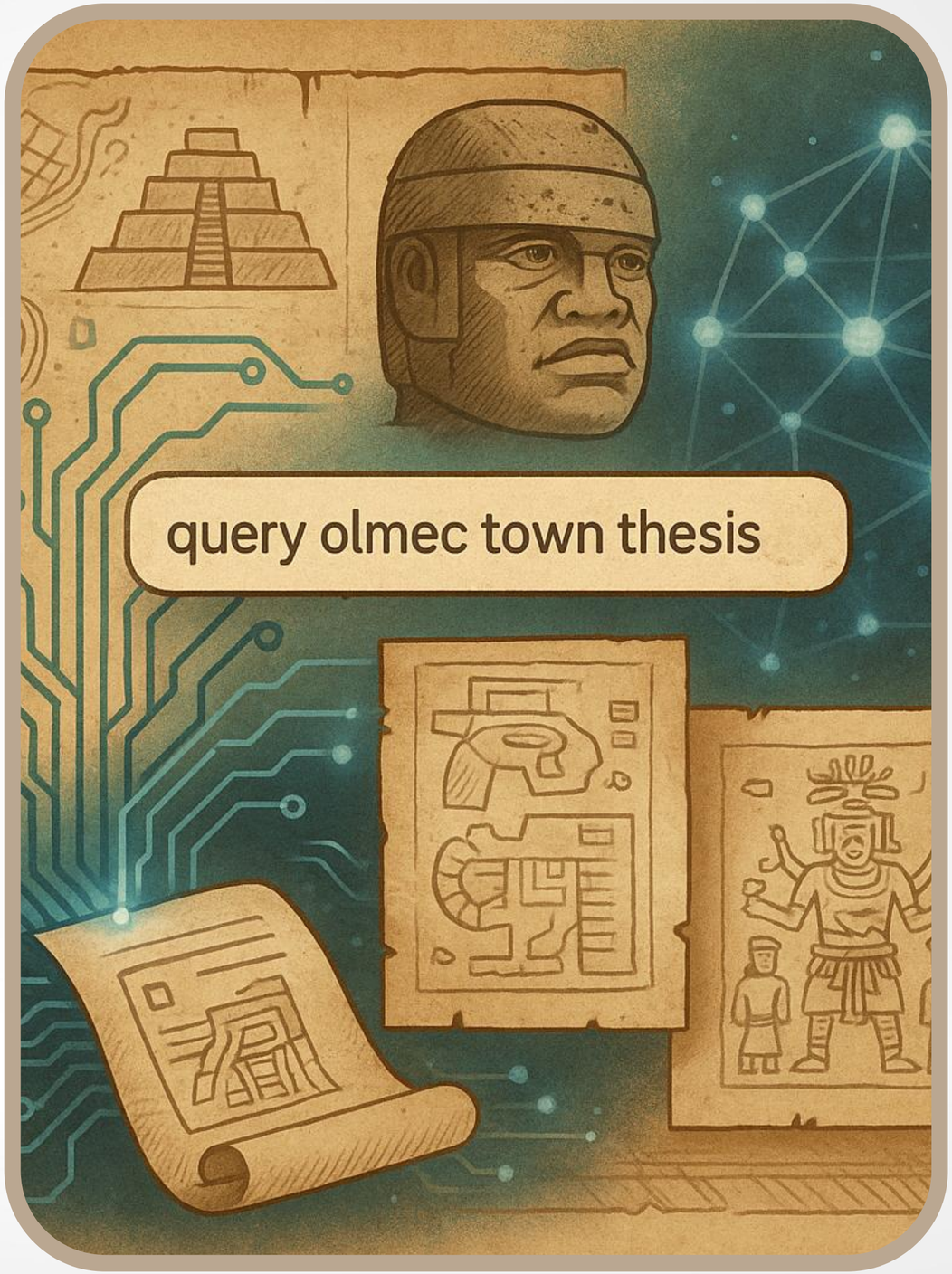
FROM STONE TO SIGNAL:

A MULTIMODAL AI SYSTEM FOR ARCHAEOLOGICAL INTERPRETATION



Larissa Terranova
• Digital Humanities Researcher • CSACA

Introducing Heritage Lens

Developed during

the **14-week Johns Hopkins Engineering Executive and Professional Education course ‘Applied Generative AI’**

delivered by **Great Learning,** using advanced RAG and CLIP technologies.



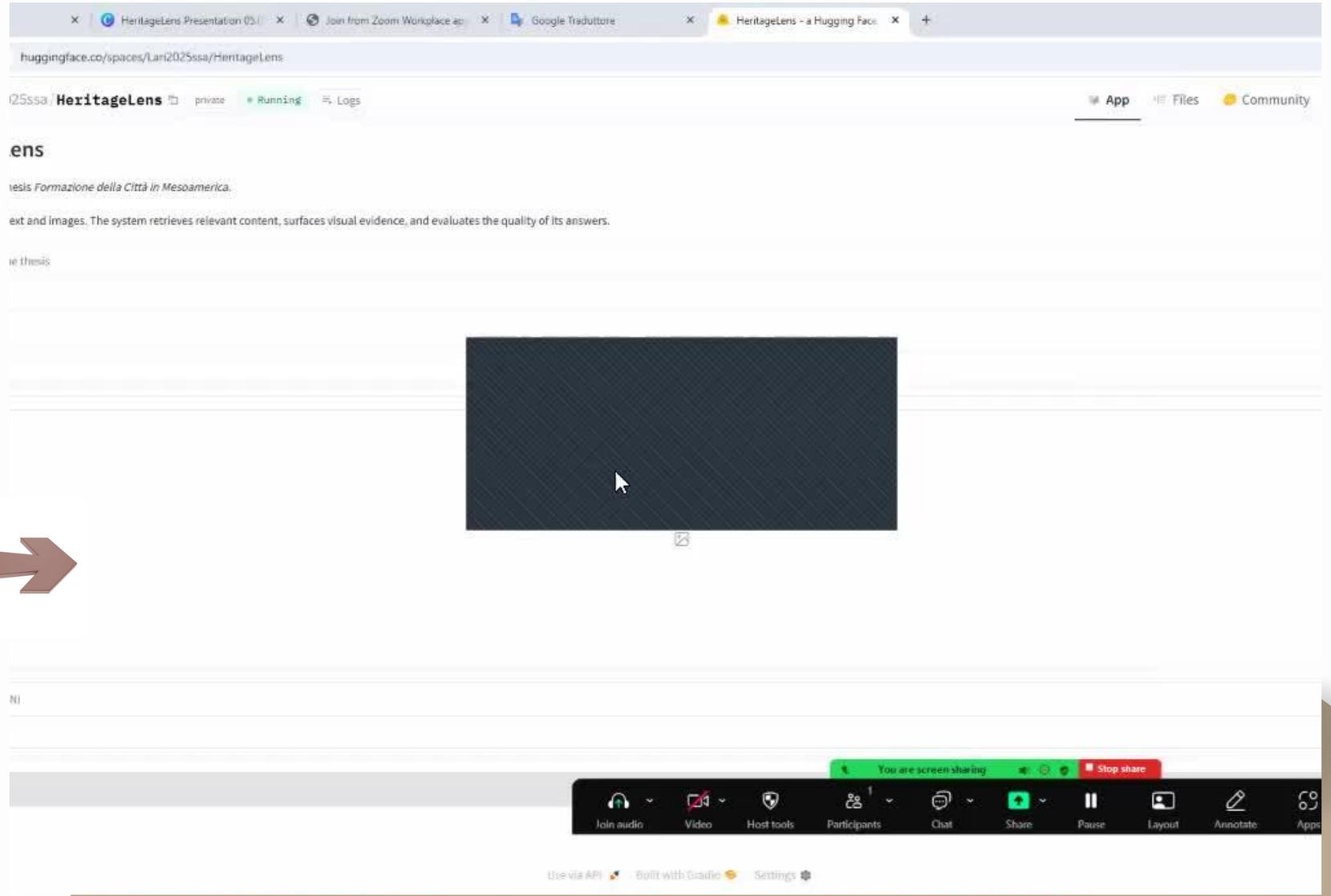
CSA CA
CENTRO STUDI AMERICANISTICI

Circolo Amerindiano

A new way to explore cultural heritage with AI

Heritage Lens

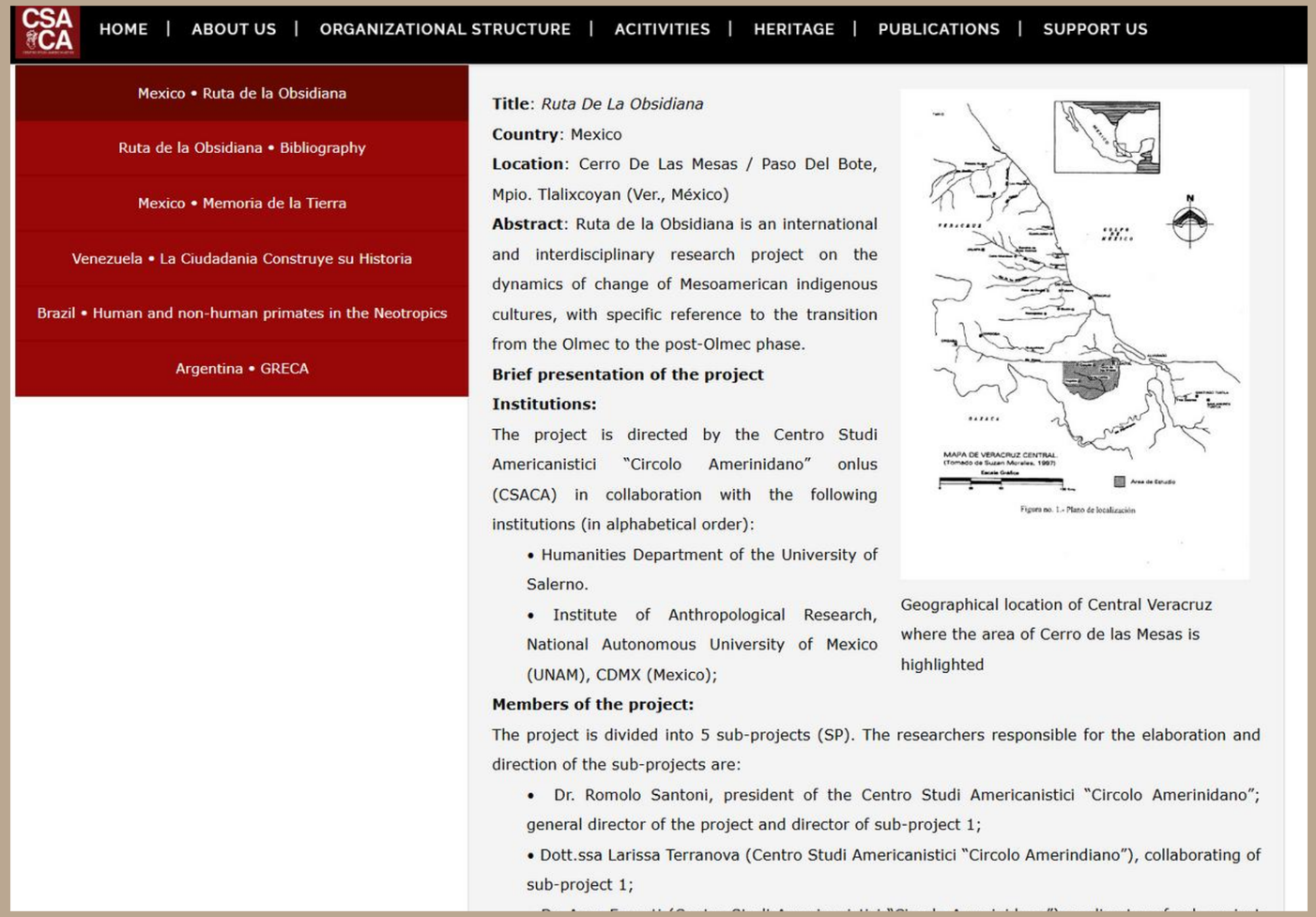
DEMO VIDEO



Larissa Terranova - Digital Humanities Researcher

Research Framework: Ruta de la Obsidiana

- **Directed by** Centro Studi Americanistici “Circolo Amerindiano” (CSA) – Perugia, Italy
- **In collaboration with:**
- University of Salerno – Humanities Department
- National Autonomous University of Mexico (UNAM) – Institute of Anthropological Research
- **Focus:** dynamics of cultural change from the Olmec to post-Olmec phase
- **My role:** sub-project researcher on Olmec urbanisation (Centro Studi Americanistici “Circolo Amerindiano”)



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Mexico • Ruta de la Obsidiana

Ruta de la Obsidiana • Bibliography

Mexico • Memoria de la Tierra

Venezuela • La Ciudadania Construye su Historia

Brazil • Human and non-human primates in the Neotropics

Argentina • GRECA

Title: *Ruta De La Obsidiana*

Country: Mexico

Location: Cerro De Las Mesas / Paso Del Bote, Mpio. Tlalixcoyan (Ver., México)

Abstract: Ruta de la Obsidiana is an international and interdisciplinary research project on the dynamics of change of Mesoamerican indigenous cultures, with specific reference to the transition from the Olmec to the post-Olmec phase.

Brief presentation of the project

Institutions:

The project is directed by the Centro Studi Americanistici “Circolo Amerinidano” onlus (CSACA) in collaboration with the following institutions (in alphabetical order):

- Humanities Department of the University of Salerno.
- Institute of Anthropological Research, National Autonomous University of Mexico (UNAM), CDMX (Mexico);

MAPA DE VERACRUZ CENTRAL
(Tomado de Suzan Morales, 1997)
Escala Gráfica
Area de Estudio
Figura no. 1.- Plano de localización

Geographical location of Central Veracruz where the area of Cerro de las Mesas is highlighted

Members of the project:

The project is divided into 5 sub-projects (SP). The researchers responsible for the elaboration and direction of the sub-projects are:

- Dr. Romolo Santoni, president of the Centro Studi Americanistici “Circolo Amerinidano”; general director of the project and director of sub-project 1;
- Dott.ssa Larissa Terranova (Centro Studi Americanistici “Circolo Amerindiano”), collaborating of sub-project 1;

Finding answers in cultural heritage requires time and dedication.

Heritage Lens



Long, dense documents



Text mixed with maps, symbols, images



Hours or days to find one detail

What if we could just ask a question?

Transform specialised knowledge into conversational exploration

Heritage Lens

01 Natural, everyday language queries

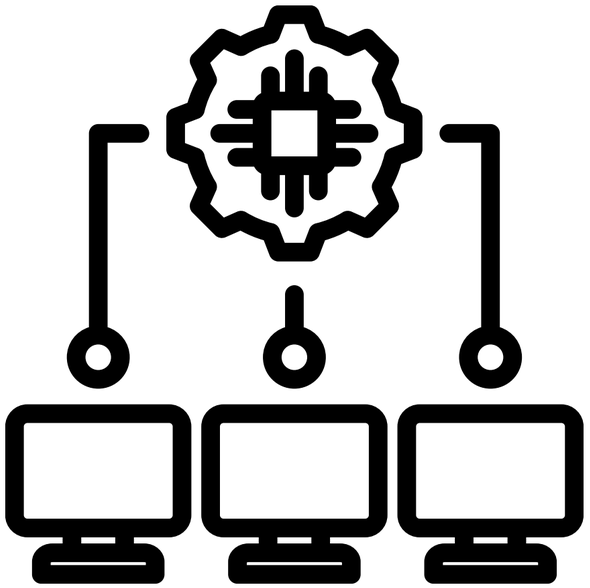
02 Instant access to relevant content

03 Not just text → also images and maps

04 Fast, accurate, and accessible to everyone

The Three Specialised Assistants

Heritage Lens



📚 **The Research Assistant** | Searches through documents using semantic understanding to find the most relevant passages

🖼️ **The Visual Curator** | Retrieves related images, maps, and archaeological artefacts using CLIP vision models

✅ **The Quality Checker** | Ensures answers are accurate, grounded in sources, and properly referenced

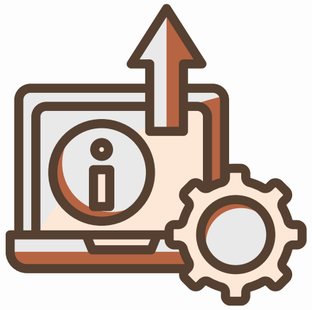
RAG (Retrieval-Augmented Generation) + CLIP Vision Models + GPT-4 Turbo

Three Steps Framework



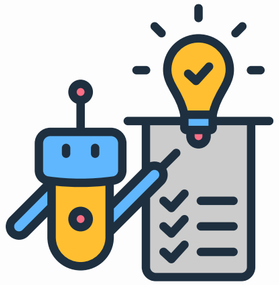
The system finds relevant text passages about important sites and more

1. SEARCH



Locates archaeological site photos and artefact images

2. RETRIEVE



Creates a clear answer combining both sources

3. EXPLAIN

What the System Cannot Do

- **Source Dependent: at the moment, Heritage Lens can only work with information that's actually in the thesis**
- **Interpretation Limits: it provides information access, not archaeological expertise**
- **Heritage Lens assists research, but doesn't replace scholarly judgement**

Heritage Lens unlocks archaeological expertise for broader communities.



Democratise

academic knowledge for broader audiences

Support

students, researchers, and the public

Promote

cross-cultural heritage exploration

Connect

past and present understanding

Enable ethical AI

applications in cultural contexts

From specialised research to accessible heritage exploration for everyone

The Bigger Vision

From one thesis → to global heritage



Museums and digital archives worldwide





Cross-cultural comparative research projects



Educational institutions and classrooms



Public engagement with indigenous heritage

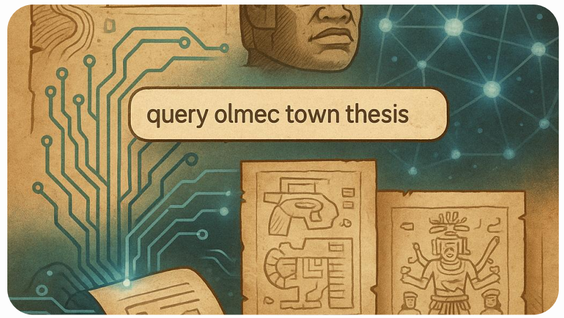
Multilingual heritage accessibility

Part of the broader Ruta de la Obsidiana initiative for Mesoamerican studies

Key Takeaway

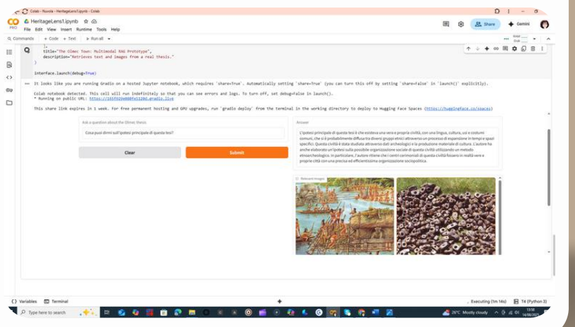
Past ↔ Present

Ancient Olmec knowledge meets modern AI technology



Research ↔ Public

Academic insights become accessible to everyone



Words ↔ Images

Text and visuals work together seamlessly



Bridging Contexts

Heritage Lens as an evolution of this

I love the idea that generative AI could help preserve and share all the knowledge held in places like this or throughout other forms of cultural heritage.





YOUR QUESTIONS, REFLECTIONS, AND IDEAS ARE WELCOME.

Q&A

Let's continue the conversation together.

Larissa Terranova
• Digital Humanities Researcher •
CSACA

Thank you!

Feedback Form

LinkedIn

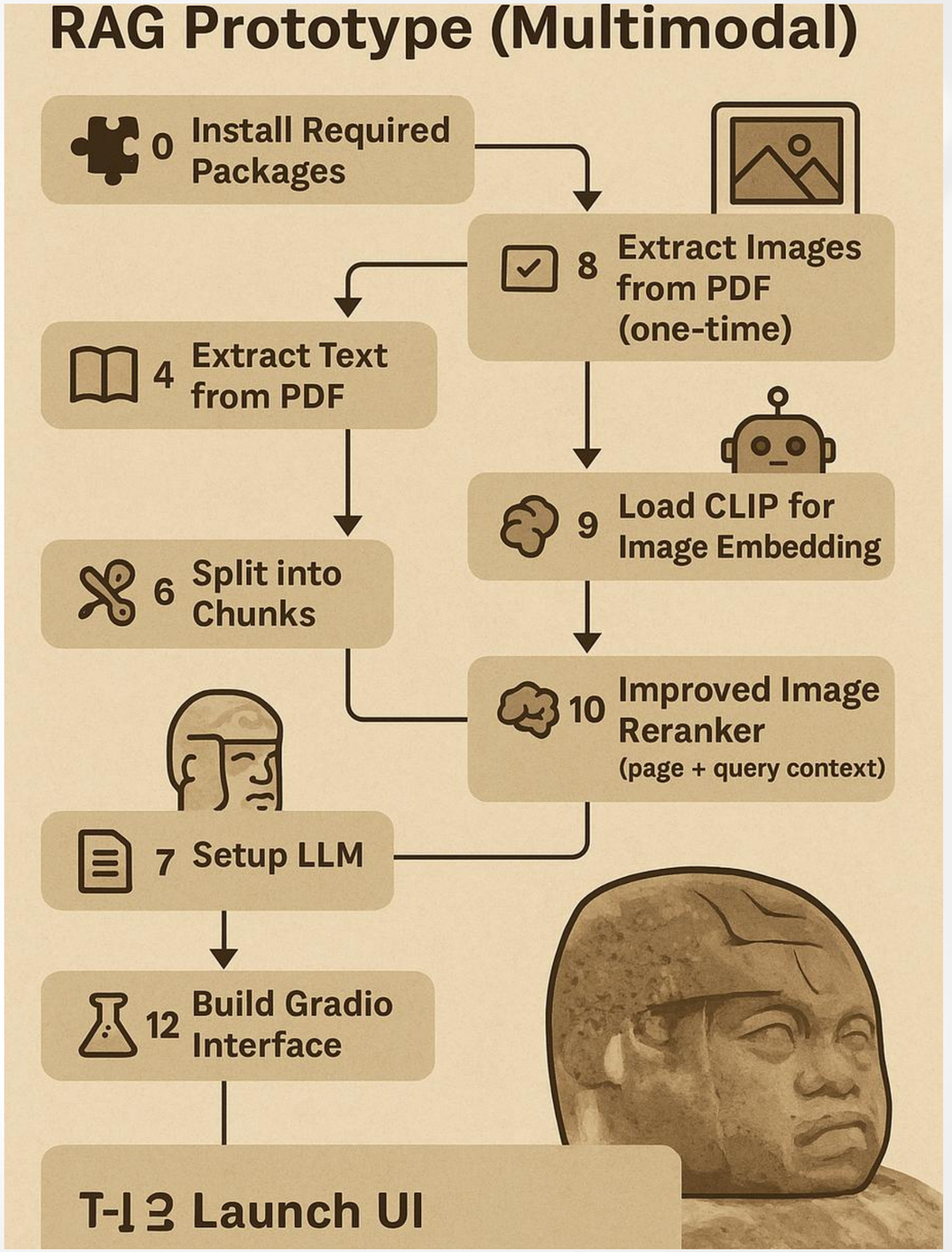
Scan to share feedback or connect with me

1. SEARCH →

2. RETRIEVE →

3. EXPLAIN →

Larissa Terranova
• Digital Humanities Researcher •
CSACA



Inside Heritage Lens

A MULTIMODAL DIGITAL ASSISTANT FOR CULTURAL HERITAGE EXPLORATION

Reads both text and images from academic sources

Finds semantically relevant passages and visuals

Generates clear, grounded explanations

Built on the Olmec civilisation research thesis

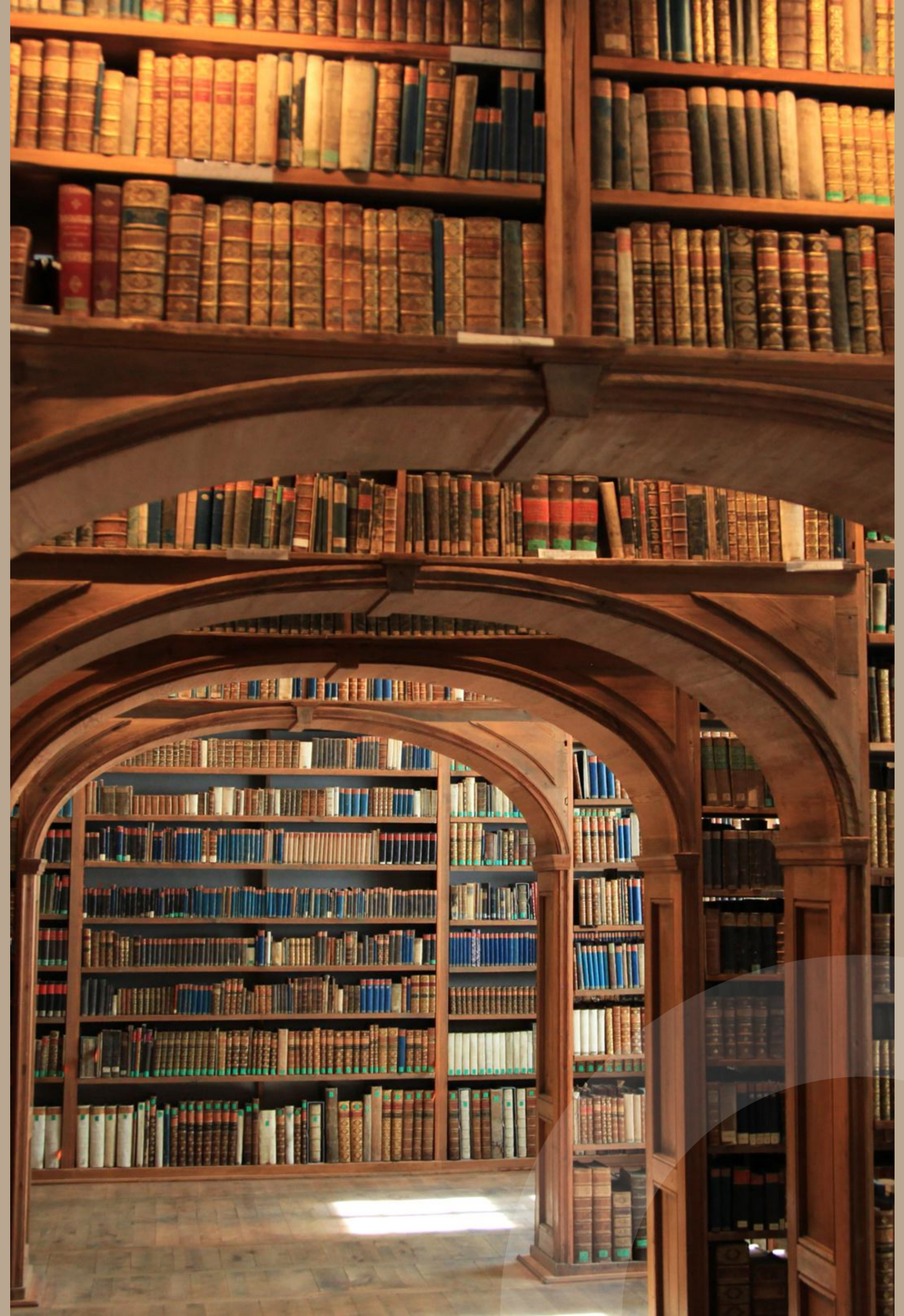
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Building on Existing Tools

Moretti (2013): "Distant reading" of large text corpora → Heritage Lens extends this to multimodal archaeological datasets

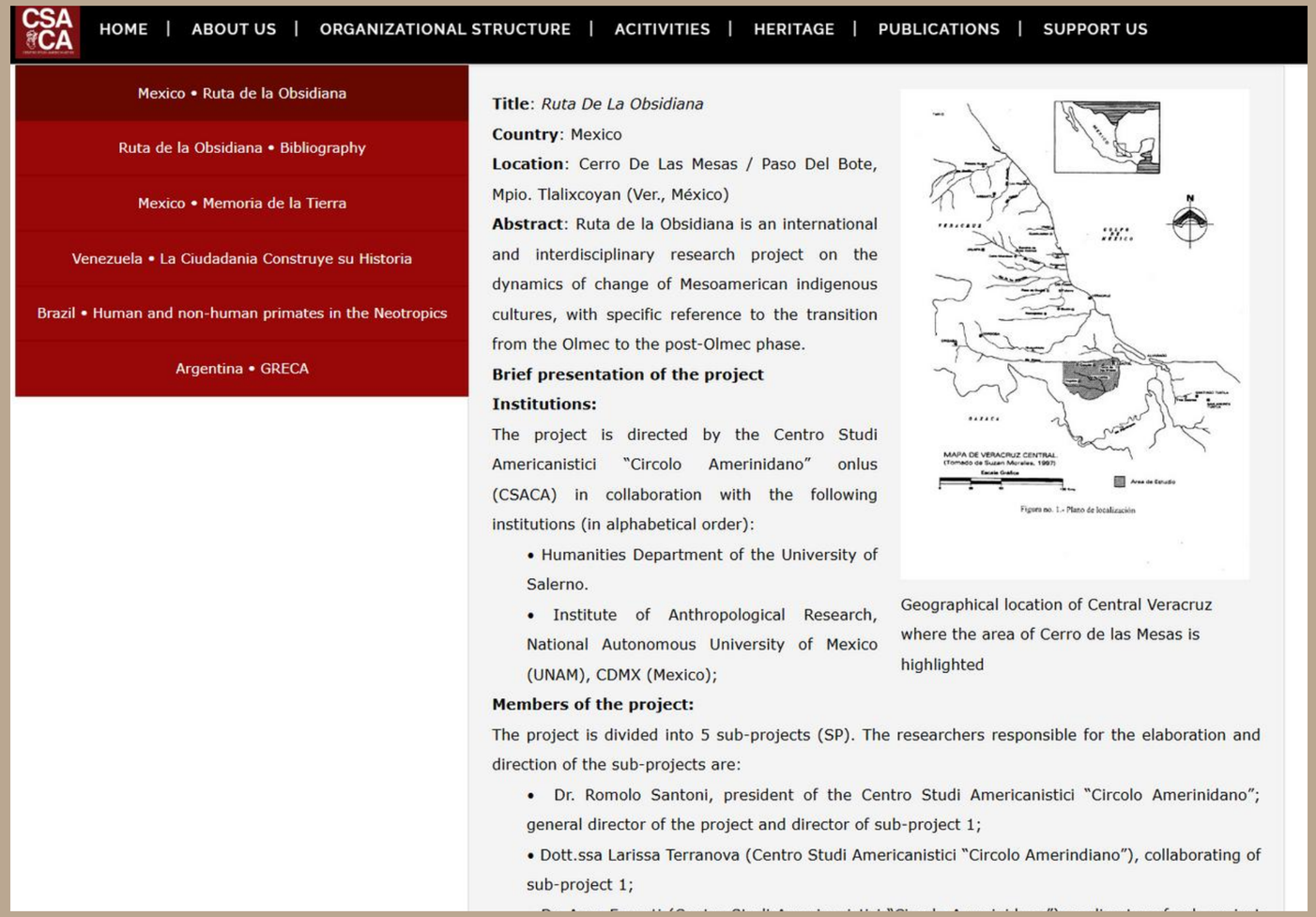
MUSEUM DATABASE	ARCHAELOGICAL ARCHIVES	IMAGE LIBRARIES
Structured catalogues with manual descriptions (like the British Museum's online collection)	Document repositories requiring keyword searches	Photo collections with basic tagging systems

Identified Gap: No existing system combines semantic text retrieval with visual similarity matching for archaeological interpretation.



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Heritage Lens as Scholarly Tool



Accessible, meaningful, and respectful for everyone

Advanced AI as a tool for cultural heritage preservation and ethical interpretation

Thank you!

Feedback Form

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