

Sunoikisis Digital Classics



Session 4: Named Entity Recognition

February 24, 2016

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Session outline

- 1. Introduction to NER (15 min)
- 2. The Pelagios project (5 min)
- 3. The SNAP:DRGN project (10 min)
- 4. Recogito practical session (20 min)
- 5. What can you do with geotagged data? (15 min)
- 6. Exercise (10 min)



What are Named Entities?

- 1. People (groups, titles)
- 2. Places (cities, countries, rivers, peoples)
- 3. Events
- 4. Dates and times
- 5. Works (bibliography)
- 6. Citations

What is Named Entity Recognition?

Two steps:

- 1. Identify proper nouns
 - strings in text
- 2. Disambiguate entities
 - is "Washington" a place or a person?
 - if place: the state or the city? (or...?)

How do we do NER?

Two options:

- By hand
 - identify strings in text
- 2. Programmatically
 - predictively identify (and resolve) strings in text

How do we do NER? — programmatically

Tools and algorithms:

- 1. Looks for words starting with capitals
 - a. except for start of sentences?
 - b. compare with dictionary to eliminate common words
 - c. predictive/statistical algorithms
 - d. context of surrounding words; specifics of text; language
 - e. check against onomasticon or gazetteer

How do we do NER? — programmatically

Tools and algorithms:

- 2. Looks for names in prosopographies/atlases
 - a. propose options to user
 - b. rank options by popularity
 - c. use context to help rank/identify
 - d. learn from "ground truth" data

Why do we do NER?

Enrich texts/data—

- Search for people/places/references
- Contextual display of name and entity information
- Detect relationships between entities
- Draw networks of entities and texts
- Set "ground truth" for text parsing tools



What is Pelagios?



- Pelagios: Enable Linked Ancient Geodata In Open Systems
- Aim: to interlink data about the Ancient World using Linked Open Data methods
- Focused on places
- Links online resources that reference ancient places all together, to allow navigating between them and comparison of their contents
- Connects ancient world research resources through the places they refer to
- Several stages focused on different types of data: currently Pelagios 6, funded by the Andrew W. Mellon Foundation





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Dr Elton Barker (Community

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The Open University

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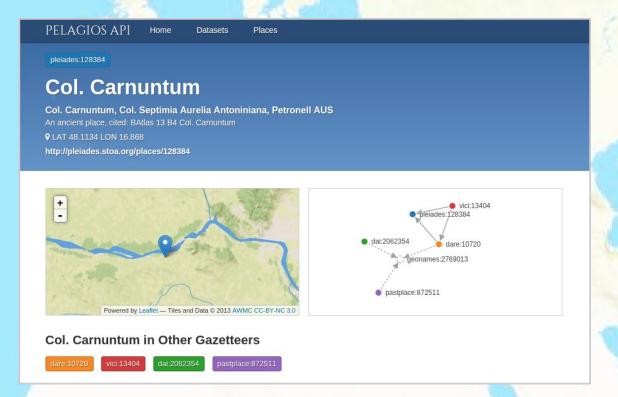
Dr Rainer Simon (Technical Director)

AIT: Austrian Institute of Technology rainer.simon (at) ait.ac.at

Team and Partners

- Google Ancient Places (Open University, Southampton)
- LUCERO (The Open University)
- Pleiades (Institute for the Study of the Ancient World, NYU)
- Perseus Digital Library (Tufts)
- Arachne (Cologne)
- SPQR (King's College, London)
- Digital Memory Engineering (Austrian Institute of Technology)
- Open Context (UC Berkeley)
- CLAROS (Oxford)
- PtolemyMachine (Holy Cross)
- Ure Museum (Reading)
- FastiOnline (AIAC)
- Nomisma (ANS)
- Regnum Francorum Online
- The British Museum
- Inscriptions of Israel/Palestine (Brown)
- Papyri.info (ISAW/NYU)
- Ports Antiques
- Oracc (U. Penn.)
- Meketre (Vienna)
- OCRE (ANS/ISAW)
- Squinchpix
- ORBIS (Stanford)
- MJBC (Cambridge)
- ISAW Papers (ISAW)
- Totenbuch (Bonn/Cologne)
- Portable Antiquities Scheme (The British Museum)
- SAWS (KCL/Uppsala/Stockholm/Vienna)
- still growing

Gazetteers



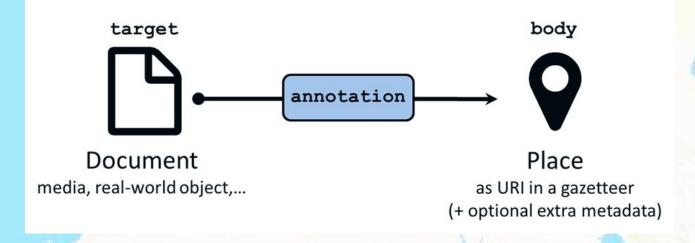


- Gazetteers are georeferenced places stored as <u>URIs</u>
- There are different gazetteers: according to historical period, geographical coverage, cultural focus, etc.
- Pelagios uses different gazetteers:
 - To annotate data in the form of stable URIsTo search across several databases
 - To disambiguate references
 - To build links between gazetteers

https://github.com/pelagios/pelagios-cookbook/wiki/Pelagios-Gazetteer-Interconnection-Format

Annotating places in Pelagios





- You annotate a place in an ancient text or map
- 2. You reference it to an existing gazetteer as a URI
- Your annotation goes into the magic of Linked
 Open Data

Linking Early Geospatial Documents through annotation: Recogito

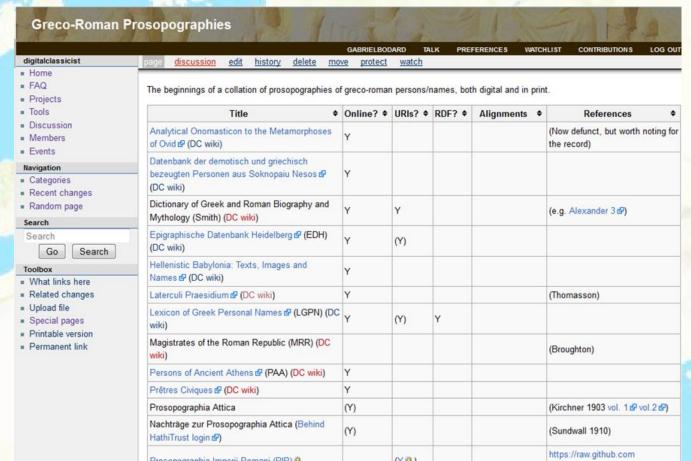




Annotate, link and index place references in ancient documents that use written and visual representation to describe space



Standards for Networking Ancient Person-data



SNAP:DRGN outcomes

- 1. Virtual authority list of persons
- 2.Gold standard for NER/parsing
- 3. Research tool & annotation graph
- 4. Scholarly and student engagement
- 5. Tools and ontologies ecosystem

SNAP partner projects & datasets

- Lexicon of Greek Personal Names
- Trismegistos (Ptolemaic Prosopography + Papyri)
- Prosopographia Imperii Romani
- Prosopography of the Byzantine World
- Prosopography of the Roman Republic
- Hellenistic Babylon: Texts, Images and Names
- Catalogue of Syriac Saints
- Roman Inscriptions of Britain
- Smith Dictionary
- Numismatic issuers and Ceramic potters

SNAP: Linked Open Data

- Creating and publishing digital data
- Emphasizing relationships between diverse collections
- Utilizing stable identifiers for entities
- Utilizing ontologies for predicates / properties

SNAP: Linked Open Data: Relational model

ID	Туре	Colour	Loc	Coord X	Coord Y
0017	Skyphos	red	62		
0018	Kylix	black	62	•••	
0019	Amphora	red	store		
			77		

SNAP: Linked Open Data: Relational model

ID	Туре	Colour	Loc	Coord X	Coord Y
0017	6	red	62		•••
0018	7	black	62	•••	•••
0019	8	red	store	•••	•••
			1		

SNAP: Linked Open Data: Relational model

ID		Туре	Colour	Loc	Coord X	Coord Y
0017	6		red	62		•••
0018	7	ID	Name	BM key	Getty	
0019	8	6	Skyphos	x9114		
		7	Kylix	•••		

SNAP: Linked Open Data

myuri:pot0017

→ rdf:type

bmobject:x9114

SNAP: Linked Open Data

- http://example.com/objects/pot0017
- http://www.w3.org/1999/02/22-rdf-syntax-ns#type
- http://collection.britishmuseum.org/resource/thes/x9114.

IAph 12.614 line 1 "[Τίτον] Καίσαρα Αὐτοκράτ[ο]-"

IAph 12.614 line 1 "[Τίτον] Καίσαρα Αὐτοκράτ[ο]-"
Refers to PIR² F 398: "IMP. CAESAR VESPASIANVS AVGVSTVS"

IAph 12.614 line 1 "[Τίτον] Καίσαρα Αὐτοκράτ[ο]-"
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So <u>I</u> claim

IAph 12.614 line 1 "[Τίτον] Καίσαρα Αὐτοκράτ[ο]-"
Refers to PIR² F 398: "IMP. CAESAR VESPASIANVS AVGVSTVS"
So <u>I</u> claim
(today)

http://example.org/annotations/01 rdf:type oa:Annotation;

http://example.org/annotations/01 rdf:type oa:Annotation;

oa:hasTarget http://insaph.kcl.ac.uk/iaph2007/iAph120614.html#al1 .

```
<http://example.org/annotations/01> rdf:type oa:Annotation ;
   oa:hasTarget <http://insaph.kcl.ac.uk/iaph2007/iAph120614.html#al1> ;
   oa:hasBody <http://data.snapdrgn.net/person/6293/> .
```

```
<a href="http://example.org/annotations/01">http://example.org/annotations/01</a> rdf:type oa:Annotation;
oa:hasTarget <a href="http://insaph.kcl.ac.uk/iaph2007/iAph120614.html#al1">http://insaph.kcl.ac.uk/iaph2007/iAph120614.html#al1</a>;
oa:hasBody <a href="http://data.snapdrgn.net/person/6293/">http://data.snapdrgn.net/person/6293/</a>;
oa:annotatedBy <a href="http://viaf.org/viaf/106795353">http://viaf.org/viaf/106795353</a>.
```

```
<http://example.org/annotations/01> rdf:type oa:Annotation ;
    oa:hasTarget <http://insaph.kcl.ac.uk/iaph2007/iAph120614.html#al1> ;
    oa:hasBody <http://data.snapdrgn.net/person/6293/> ;
    oa:annotatedBy <http://viaf.org/viaf/106795353> ;
    oa:annotatedAt "2015-04-14T07:00:00+01:00Z"^^xsd:date .
```

12.614. Honours for Titus Caesar

Description: Plain white marble statue base shaft broken below and chipped at the upper left corner (W. 0.72 x H. 1.16 x D. 0.52)

Text: Inscribed on the face. Two large squre cuttings on top

Letters: II. 1, 2, 4-5, 0.035; II. 3, 6-7, 0.03.

Date: A.D. 69-79 (reign)

Findspot: Walls, South (east part): reused in the south city wall, in the excavations of the inside face, Trench 3.

Original Location: Unknown
Last recorded location: Museum

History of discovery: Excavated by the NYU expedition in 1975 (75.334; SBI 51).

Bibliography: Mentioned by Reynolds, ZPE 43, 1981, 320, whence McCabe PHI Aphrodisias 1939. Text constituted from: Preliminary transcription (Reynolds) This edition Roueché and Bodard (2007).

Edition Diplomatic Epidoc (XML) [Conventions][Font help]

[Τίτον] Καίσαρα Αὐτοκράτ[ο]-

[ρ]ος Καίσαρος Ούεσπασια-

[ν]οῦ Σεβαστοῦ υἰὸν νας.

νν. ὁ δῆμος star ἐκ τῶν ἀπο-

[λ]ειφθέντων ὑπὸ Άττα- *star*

λίδος τῆς Μενεκράτους

τοῦ Ἀνδρῶνος Ἀπφίου νν.

Translation:

[Titus] Caesar, son of Imperator Caesar Vespasianus Augustus: the People (put up his statue) from the (funds) bequeathed by Attalis Apphion, daughter of Menekrates, the son of Andron.

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[Τίτον] Καίσαρα Αὐτοκράτ[ο]-

[ρ]ος Καίσαρος Ούεσπασια-

[v]οῦ Σεβαστοῦ uiòv *vac*.

VV. Ο ότιμος star εκ των απο-

[λ]ειφθέντων ὑπὸ Άττα- star λίδος τῆς Μενεκράτους τοῦ Άνδρῶνος Άπφίου νν.

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Findspot: Walls, South (east part): reused in the south

Original Location: Unknown Last recorded location: Museum

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Bibliography: Mentioned by Reynolds, ZPE 47, 1981, 3

Text constituted from: Preliminary transcription (Rev



0.52)

Εdition Diplomatic Epidoc ()
[Τίτον] Καίσαρα Αὐτοκράτ[ο][ρ]ος Καίσαρος Ούεσπασια[ν]οῦ Σεβαστοῦ υἰὸν νας.

νν. ὁ δήμος star ἐκ τῶν ἀπο-

[λ]ειφθέντων ὑπὸ Άττα- star λίδος τῆς Μενεκράτους τοῦ Άνδρῶνος Άπφίου νν.

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[Conventions][Font help]

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Text constituted from: Preliminary transcription (Rev

Standards for Networking Ancient Prosopographies

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PIR ID: F.398

SNAP ID: 6293

NAME: T. FLAVIVS

VESPASIANVS

DESCHIDEES 2

0.52)

Edition

Diplomatic Epidoc

[Conventions][Font help]

[Τίτον] Καίσαρα Αὐτοκράτ[ο]-

[ρ]ος Καίσαρος Ούεσπασια-[v]οῦ Σεβαστοῦ υἰὸν *vac.*

VV. Ο δημος Star εκ Ιων άπο-

5 [λ]ειφθέντων ὑπὸ Ἁττα- star λίδος τῆς Μενεκράτους τοῦ Ἁνδρῶνος Ἁπφίου νν.

Translation:

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Conve

Edition Diplomatic Epidoc (

[Τίτον] Καίσαρα Αὐτοκράτ[ο]-[ρ]ος Καίσαρος Ούεστασια-

[ν]οῦ Σεβαστοῦ υἰὸν *νας*.

VV. O OTHOS SIAI EK IWV OTTO-

5 [λ]ειφθέντων ὑπὸ Ἁττα- star λίδος τῆς Μενεκράτους τοῦ Ἁνδρῶνος Ἁπφίου νν.

This is the Emperor Vespasian!

Translation:

[Titus] Caesar, son of Imperator Caesar Vespasianus Augustus: the People (put up his statue) from the (funds) bequeathed by Attalis Apphion, daughter of Menekrates, the son of Andron.

SNAP:DRGN "scenarios"

- I. Put prosopography online (URIs)
- II. Contribute person RDF to SNAP:DRGN
- III. Identify co-references
- IV. Make assertions/relationships
- V. Annotate your texts with person ids

SNAP:DRGN "scenarios"

II. Contribute person RDF to SNAP:DRGN

i-iv. URI, type, citation, publisher (required)

v. Name (recommended)

vi. Attestations (recommended)

vii. Disambiguators (optional)

viii. Relationships/bonds (optional)

ix. Other identifiers (optional)

Standards for **Networking Ancient Prosopographies**

Title of secondary navigation

Nav 1

Nav 2

Nav 3

Nav 4

Nav 5

LGPN V3a Εὐρυδίκα 1 SNAP 650000

Identifiers:

Source: LGPN V3a Εύρυδίκα 1 (V3a-44647) SNAP: http://data.snapdrgn.net/person/650000

Name(s)

Ancient Greek: Eurudika (LGPN) Latin: Εύρυδίκα (LGPN) Ancient Greek in Latin characters: nE_urudi1ka (LGPN)

Associated Information:

Kalydon (LGPN) Associated Place **Associated Date**

ii BC (-0200/-0100 LGPN)

Attestations

Textual Reference(s) IG IX (1)2 (1) 145 (LGPN)

Person Relationships

Mother of: Αρισταρχίς (LPGN V3a Αρισταρχίς 1)

COMMENTARY

Structured commentary on this person record.

No commentary yet result 1 result 2

ANNOTATIONS

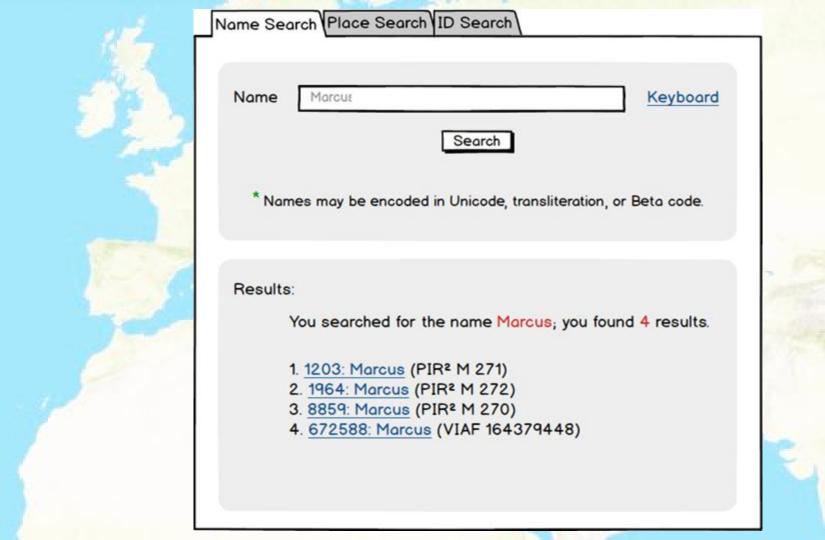
External texts or resources annotated with references to this person record.

No annotations yet result 1 result 2

RESOURCES 2

Some links here Some links here Some links here Some links here

Search » ID Search Search By SNAP ID: SNAP ID: Search -OR-URI: Search Search By Original ID: Original ID: -Select Project- ▼ Search LGPN TM PIR -OR-URI: Search



Search » Name Index

 $\begin{array}{c} \left[\ \underline{A} \ \underline{I} \ \underline{B} \ \underline{I} \ \underline{C} \ \underline{I} \ \underline{D} \ \underline{I} \ \underline{E} \ \underline{I} \ \dots \dots \dots \ \underline{I} \ \underline{X} \ \underline{I} \ \underline{Y} \ \underline{I} \ \underline{Z} \ \underline{I} \end{array} \right] \\ \left[\ \underline{\alpha} \ \underline{I} \ \underline{B} \ \underline{I} \ \underline{Y} \ \underline{I} \ \underline{S} \ \underline{I} \ \underline{E} \ \underline{I} \ \dots \dots \dots \ \underline{I} \ \underline{X} \ \underline{I} \ \underline{Y} \ \underline{I} \ \underline{D} \ \underline{I} \right] \end{array}$

Latin	Greek	Coptic	Hebrew	Arabic
Agaqoklhs	Άγαθὀκλης			
Apollon	Απόλλον			
Avinnia	Αυιννία			
Awn	Άουν			
Axapes	Άξάπης			
Axasedios	Άξασεδιος			
Axeis	Αξεῖς			

SNAP status

- 5 datasets aggregated
- Partial person pages
 - http://data.snapdrgn.net/person/1/
- SPARQL endpoint
- Guidelines for aggregation
 - http://snapdrgn.net/cookbook



PlaceNames annotation: Recogito practical session



Instructions

1. Read the tutorial and the annotation principles



RECOGITO

~

BEGINNER'S TUTORIAL

Recogito is a Web-based tool for annotating place references in early geospatial documents. It is a result of the ongoing Pelagios 3 research project, funded by the Andrew W. Melion Foundation. This tutorial provides information on how to annotate in Recogito. For general guidance on what to annotate please refer to the Google Doc describing our annotation principles.

Landing Page

The first thing you will see of Recogito is the landing page (Fig.1). This page - which is a 'public view', and doesn't require you to log in - provides an overview of the documents currently available in the system. Inside Recogito, you can always go back to the landing page with the # icon in the header bar.





2. Login with your credentials
guest01-25 OR the accounts you already have
Username = password

3. Choose a dataset:

Ancient Greek
Latin
Christian sources
Islamic sources
Maritime tradition (maps)

- 4. Choose a text or a map
- 5. Annotate & Georesolve

You will also find English translations in every section

Choose texts that you can manage.
Avoid already fully annotated texts and too complicated maps
Prefer texts whose period you are more familiar with







Pelagios API

- Provides machine readable versions of Pelagios' data
- **Ensures interoperability**
- Joins together several online resources, based on the places they refer to (gazetteers, textual databases, museum collections, inscriptions...)
- Enables mashups and other applications



Delos Ins.



An ancient place, cited: BAtlas 61 A3 Delos Ins. http://pleiades.stoa.org/places/59958

Alternative Names: Delos Coverage: Delos GRE

JSON RDF/XML Turtle



7204 References to Delos Ins.

Dataset	No. of References	
Arachne (in 1 subsets)	53 (of 128180 total in set)	
CLAROS (in 1 subsets)	6931 (of 204474 total in set)	
Pleiades Annotations in the Perseus Digital Library (in 2 subsets)	200 (of 61736 total in set)	
AWMC - Ancient World Mapping Center	1 (of 34608 total in set)	
Google Ancient Places (in 8 subsets)	19 (of 41053 total in set)	

JSON RDF/XML Turtle

llegible name on Peutinger Map (possibly St-Germain-du-Salembre)

Related Places What's This?

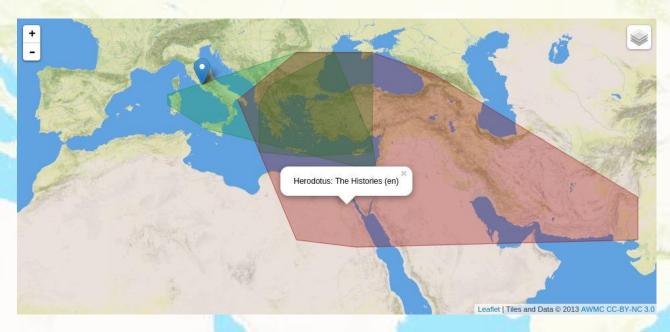
Mapping the spatial footprint of a document



```
/** Derines the map '*/
map = new L.Map('map', {
    center: new L.Map('map', {
        center: new L.Lating(41.893588, 12.488822), // Rome
        zooms 3,
        layers: [awmCLayer]
    }),

/** A shortcut to create a nicer shape drawing style than Leaflet's defactors
color: color,
weight: 1,
    color: color,
weight: 1,
    illopacity: 0.3,
    opacity: 0.6
    })

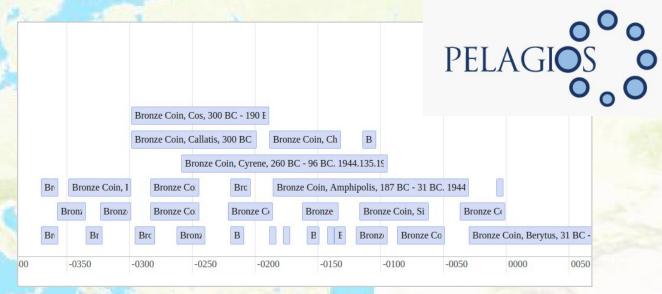
/** This is the key function: fetches data from the Pelagios API and plet
dequeryPelagiosAPI = function(query, limit, style) {
    // Note: 'verbose-true' ensures we get the convex hulls, too, not just
    // Loop through all result items, and plot the convex hull if the ite
    jouery.easlow('http://elagios.org/peripleo/search?query* + query +
    // Loop through all result items, and plot the convex hull if the ite
    jouery.easlow('http://elagios.org/peripleo/search?query* + query +
    // Loop through all result items, and plot the convex hull if the ite
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    // Loop through all result items, and plot the convex hull if the ite
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    // Loop through all result items, and plot the convex hull if the ite
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    // Loop through all result items, and plot the convex hull if the ite
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    // Loop through all result items, and plot the convex hull if the ite
    jouery.easlow('http://elagios.org/peripleo/search?query* - query +
    // Loop through all result items, and plot the convex hulls, too, not just
    jouery.easlow('http://elagios.org/peripleo/search?query* - query +
    // Loop through all result items, and plot the convex hulls, too, not just
    jouery.easlow('http://elagios.org/peripleo/search?query* - query +
    // Loop
```

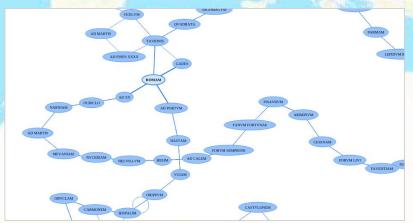


Placing Objects on a timeline

file:///C:

/Users/Chiara/Dropbox/Work%20in% 20Progress/Sunoikisis% 202016/NER%20Session%20-% 2024feb/pelagios-api-tutorialmaster/tutorial-timeline.html





Connecting toponyms in a document

file:///C:/Users/Chiara/Dropbox/Work%20in% 20Progress/Sunoikisis%202016/NER%20Session%20-% 2024feb/pelagios-api-tutorial-master/tutorial-graph.html

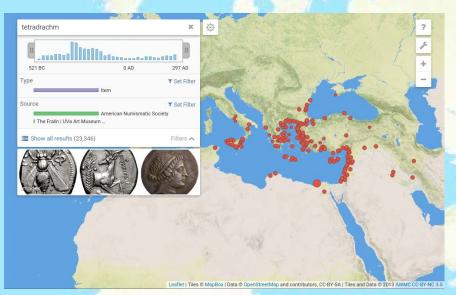
Looking around Pelagios API: Peripleo





http://pelagios.org/peripleo/map#at=29.214539445925787,12.480468750000007,3

The geographical and chronological distribution of the Tetradrachm



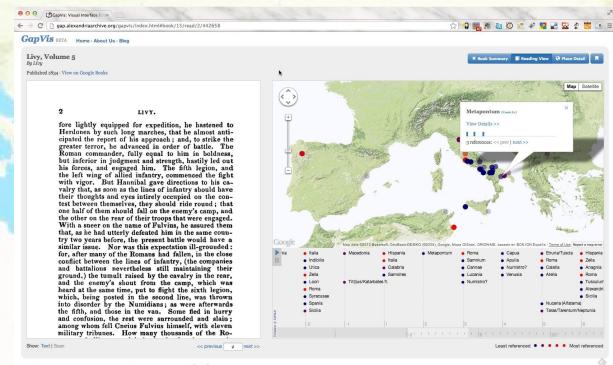


Looking for ancient theatres

- GapVis is the visualization interface developed for exploring and reading texts that reference ancient places
- It is part of the <u>Google</u> <u>Ancient Places</u> project
- It offers a general view on what places are referenced in a book and where they appear
- The Reading View offers an interface to read the text and a narrative timeline of referenced places
- The Place Detail provides deeper information about a particular geographic location

GapVis



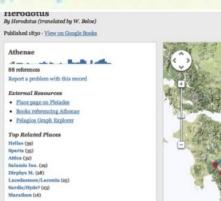


Hestia

A dynamic visualization of Herodotus' *Histories*



Connections between places



GOOGLE

Map date 02012 Basanath, GIS Innoversian, Google, Mapa Giffored, ORDINAMI, Tale After - Term of Use

Place view, showing the network of places most often associated in the text with a given place (plus links to other resources about that place)

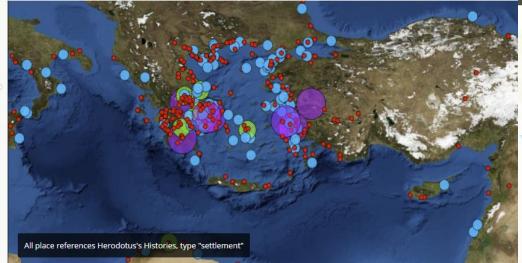












Density of place references

Let's play around with QGIS



Play around



Visualising a map helps to understand the purpose and the cultural focus of the writer

These are itineraries (*Itinerarium Burdigalense*, *Stadiasmus of the Great Sea*)





This is a comprehensive geographical work about the whole world - it suggests an imperial dimension (Strabo, *Geography*)

Categorise places:

- Distribution of types of places: settlements, natural features, man-made structures, etc.
- Visualise the single layers



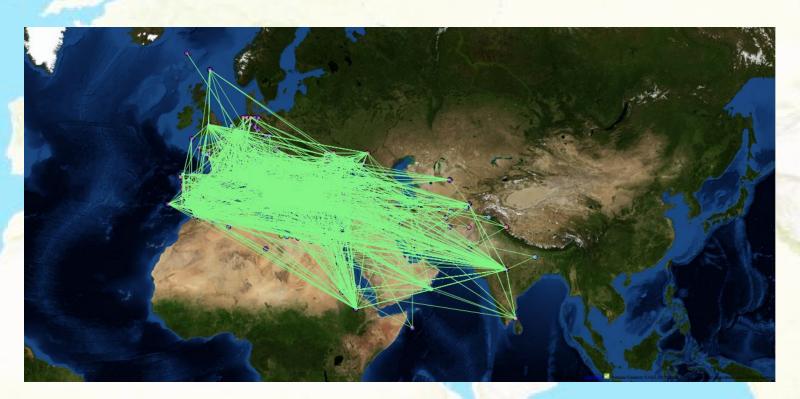
Agathemerus' Sketch of Geography: distribution of water bodies



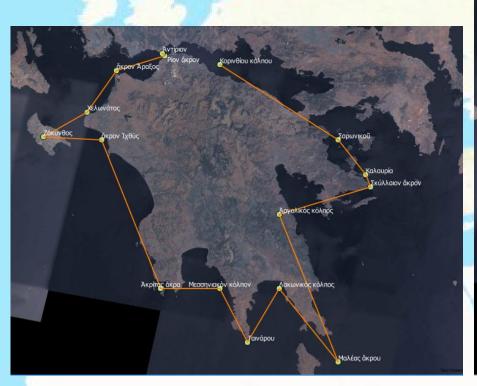
Agathemerus' *Sketch of Geography*: peoples as boundaries of the inhabited world

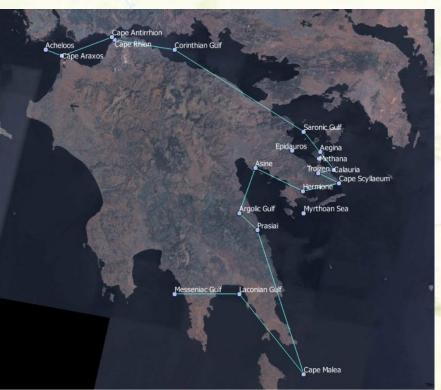
Visualise connection and itineraries

Sometimes places are just too many...



Let's simplify: visualising single routes







1. Read the Pelagios Annotation Principles

https://docs.google.com/document/d/14_cUJ7nNK__eFldeqsomgDplhDjoDdpg0mUhbbT-fpM/edit

2. Read the tutorial

RECOGITO



BEGINNER'S TUTORIAL

Recogito is a Web-based tool for annotating place references in early geospatial documents. It is a result of the ongoing Pelagios 3 research project, funded by the Andrew W. Mellon Foundation. This tutorial provides information on how to annotate in Recogito. For general guidance on what to annotate please refer to the Google Doc describing our annotation principles.

Landing Page

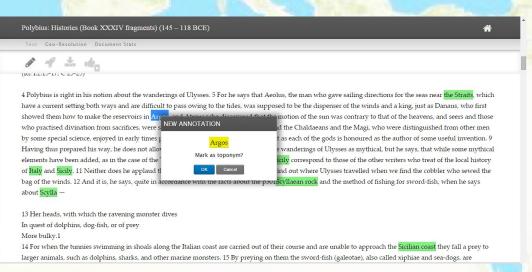
The first thing you will see of Recogito is the **landing page** (Fig.1). This page - which is a **'public view'**, and doesn't require you to log in - provides an overview of the documents currently available in the system. Inside Recogito, you can always go back to the landing page with the # icon in the header bar.



3. Annotate & Georesolve

Roughly 50-100 placenames in text or as many placenames on a map as you can (ideally 15-30)





Optional

Look at the maps, document stats and other visualizations in Recogito for the material you have added. Try downloading the geodata as a CSV file, and visualize it in QGIS.

You can find a simple QGIS tutorial on the SunoikisisDC Wiki page.

Question:

What can you learn from the data you have annotated?

http://www.qgis.org/en/site/

