

OpenAtlas

A Database System for the Humanities and Beyond

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OpenAtlas – Alexander Watzinger (Alex)



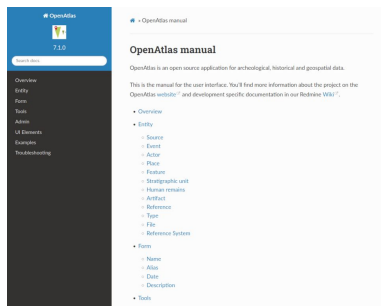
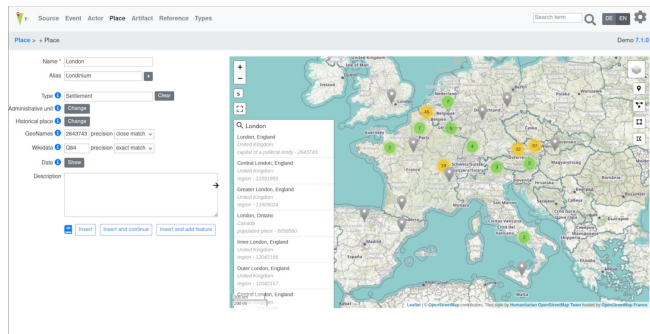
INDIGO workshop 2021

- Lead developer of OpenAtlas
- Since 2017 at the ACDH-CH
- Loves open source and scientific projects



About OpenAtlas

- Project website: <https://openatlas.eu>
- Initiated about 10 years ago by Stefan Eichert
- Mainly developed at the ACDH-CH
- Open source, browser based database software
- Acquire, edit and manage research data





OpenAtlas Collaborations

- With projects from all fields of the humanities
- Mostly historical, archaeological and prosopographic projects
- A lot of synergies between the projects

MAMEMS

APPROACH — NG
BYZANT — UM

Indigo

MEDCON

connec

Moving Byzantium

DPP | Digitising
Patterns of
Power



OpenAtlas Team



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Stefan Eichert

Idea, Concept and Data Modelling
stefan.eichert@nhm-wien.ac.at

Stefan is the initiator and master mind behind the OpenAtlas project. His main research fields are Early Medieval archaeology and history as well as computer applications in archaeology and digital humanities.



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Alexander Watzinger

Lead Developer and Concept
alexander.watzinger@oeaw.ac.at

Alex is the lead developer of OpenAtlas and has a special interest in data modeling and scientific web applications. His favorite tools are Python, PostgreSQL, Linux and open source software in general.



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Bernhard Koschicek-Krombholz

Software Development, API
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Bernhard is currently developing our API and studies Computer Sciences as well as History. His research interests include computer security, Python, digital preservation, historical geography, GIS, medieval and military history.



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Nina Richards

Bioarchaeological Expertise
nina.richards@oeaw.ac.at

Nina is an archaeologist and anthropologist, with a focus on Early Medieval burial grounds. With her expertise she provides essential support planning and implementing archeological, anthropological and scientific modules in OpenAtlas.



CC-BY 4.0, Andreas Olschnögger

Andreas Olschnögger

Frontend Development
andreas.olschnoegger@oeaw.ac.at

Andi is a frontend developer and studies computer science at the Technical University of Vienna. He mainly develops with VueJs and is also interested in UX design to make technology more accessible.



CC-BY 4.0, Moritz Großfurther

Moritz "Mocca" Großfurther

Frontend Development
moritz.großfurther@oeaw.ac.at

Mocca is a frontend developer for OpenAtlas. He's currently studying computer science at the TU Vienna and interested in design that is useful and fun to use, be that software or real life objects.



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Veronika Gründhammer

Project Administration
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Veronika provides essential support for cooperations in her role as project officer at the [ACDH-CH](#).



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Jan Belik

Logo Design and Design Consulting
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Jan is a freelance graphic designer, illustrator and art director at janbelik.com in Vienna, Austria. He has plenty of experience working with local as well as international brands and has created a range of OpenAtlas project logos.

Contributors

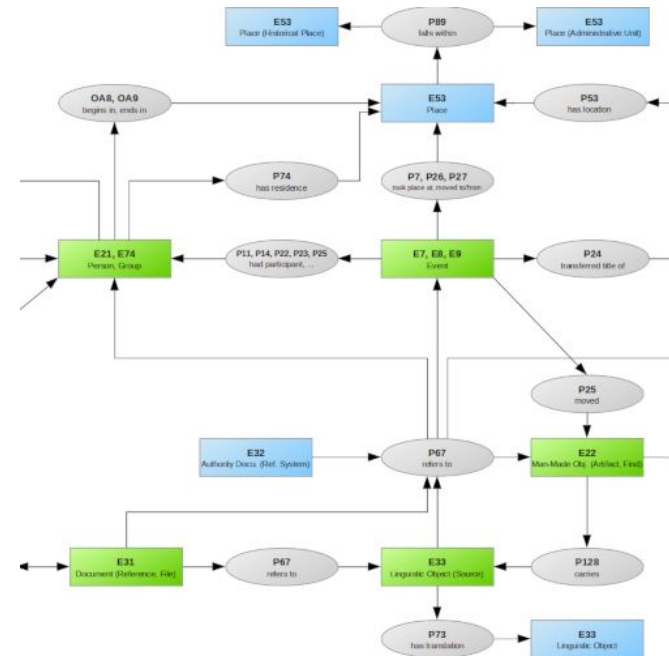
These people supported us in many different ways. Our thanks goes to all of them.

Aleksandra Apic
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Dalibor Pančić
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Katharina Winckler
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Laura Kremser
Ludwig Maximilian Breuer
Mihailo Popović
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Roland Filzwieser
Sandra Lehecka
Saranya Balasubramanian
Sebastian Majstorovic
Semra Kilic-Dinler
Seta Štuhec
Silvia Gómez-Senovilla
Stefan Probst



Model - CIDOC Conceptual Reference Model

- International standard (ISO)
- Developed by CIDOC CRM Special Interest Group
- Specifies classes for entities like actor, source, event, place and rules how to link them
- Stored in an object oriented network





Data enrichment with types and linked open data

- Standard types
- Custom types
- Value types
- Linked open data
 - Wikidata
 - GeoNames
 - Custom, e.g. Viaf, GND

Standard types

Custom types

Place types

Value types

System types

Actor actor relation

Actor function

Artifact

Bibliography

Edition

Event

Type to search

+ Type

Building activity 0

▸ Change of Property 2 (69)

Confirmation of Property 12

▸ Conflict 5

Consecration of a church 0

▸ Extreme event 0

▸ Gathering 0

▸ Mentioned 23 (5)

▸ Movement of people or goods 1 (8)

▸ Recognition of Title 0

Wedding 0

Selection: single

Classes: Acquisition, Activity, Event, Move, Production

Untyped entities: [show](#)

Description

Categories for the type of events like Change of property, Conflict, Movement, Attendance etc.



OpenAtlas Development

- Solely open source technology
- One release about every month
- Close cooperation with users
- High quality
 - Coding standards
 - Tests and coverage
 - Bugs have the highest priority
 - Tools to test data integrity



Python is an interpreted, high-level, general-purpose programming language.

Website: <https://www.python.org>

Licence: Python Software Foundation License



Flask is a micro web framework, written in Python, with the ability to scale up to complex applications.

Website: <https://palletsprojects.com/p/flask/>

Licence: BSD



PostgreSQL is a free and open source relational database management system.

Website: <https://www.postgresql.org/>

Licence: PostgreSQL License



PostGIS is a spatial database extender for PostgreSQL and adds support for geographic objects.

Website: <https://postgis.net>

Licence: GPL 2 or later



Bootstrap is a free and open source CSS framework.

Website: <https://getbootstrap.com/>

Licence: MIT



Leaflet is an open source JavaScript library used to build web mapping applications.

Website: <https://leafletjs.com/>

Licence: BSD-2-Clause



Jinja is a full-featured template engine for Python with full unicode support.

Website: <https://palletsprojects.com/p/jinja/>

Licence: BSD



API – Bernhard Koschiček-Krombholz

- Studied
 - Computer Science at Applied University Technikum Vienna
 - History at University of Vienna
- First contact with OpenAtlas
 - “Digitising Pattern of Power” in 2015
 - Since 2019 developer at OpenAtlas through “THANADOS”
- Responsibilities
 - API
 - Backend development
 - Backup administrator



THANADOS



API – Overview

- REST(-like) API
- Only **GET**, no **PUT/POST/DELETE**
 - Presentation sites
 - Analytical tools (GIS, Network Analysis)
- Documentation
 - Swagger: <https://app.swaggerhub.com/apis/ctot-nondef/OpenAtlas/0.3>
 - Redmine: <https://redmine.openatlas.eu/projects/uni/wiki/API>
 - Manual (will come)
- Versions
 - **0.2 deprecated/discontinued**
 - **0.3 stable**
 - 1.0.0 in development



API – Endpoints 1/2

- Entities

- ID
- CIDOC class
- Menu item
- OpenAtlas class
- Linked to entity
- Linked to type, also including subtypes

- Formats for Entities

- Linked Places Format (LPF)
 - <https://github.com/LinkedPasts/linked-places-format>
- RDF
 - N3, Turtle, XML, NT
- Linked Open Usable Data (LOUD)
 - <https://linked.art/>
- GeoJSON



API – Endpoints 2/2

- Types
 - Full hierarchy
 - List
- Administrative data
 - OpenAtlas classes
 - Content
 - Count of entities sorted by class
- Image
 - display (resized) image
- Special endpoints
 - Export database dump
 - Geometries (e.g. for leaflet or GIS)
 - Subunits (THANADOS)



API – Parameters

- Options
 - Download
 - Count
 - Format
 - Export
- (Seek) Pagination
 - Page
 - First
 - Last
 - Limit
 - Sort
 - Column
- Manipulate output format
 - Show
 - Relation type
- Filter
 - Type
 - Search
- Special
 - Lang
 - Geometry
 - Image size



API – Usage Examples

- {domain} / api / ({version}) / {endpoint} ? {parameter} & {parameter}
- <https://demo-dev.openatlas.eu/api/0.3/entity/10608>
- https://demo-dev.openatlas.eu/api/system_class/person?type=25&sort=desc&column=id&limit=50&format=lp
- [https://demo-dev.openatlas.eu/api/system_class/person?search={"typeID":\[{"operator":"equal","values":\[25,8247\],"logicalOperator":"and"}\],"entityName":\[{"operator":"like","values":\["Costa","Costo"\],"logicalOperator":"or"}\]}](https://demo-dev.openatlas.eu/api/system_class/person?search={)



API – Perspective

- Fetching data from ARCHE
- New major version 1.0.0
- Implement LOUD



Front End



- Andreas Olschnögger
 - Studies
 - Bachelorstudium Software & Information Engineering
 - Masterstudium Software Engineering & Internet Computing
 - since January 2022 Developer for OpenAtlas



- Moritz Großfurtner
 - Studies
 - Bachelorstudium Medieninformatik und Visual Computing
 - since October 2022 Developer for OpenAtlas



Front End – User Interface for data entry

Source Event Actor **Place** Artifact Reference Types

Search term

Place > Edit Demo 7.7.0

Name *

Alias

Type

Administrative unit

Historical place

Artois-Picardie

GeoNames precision

Wikidata precision

Date

Description

→

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Leaflet

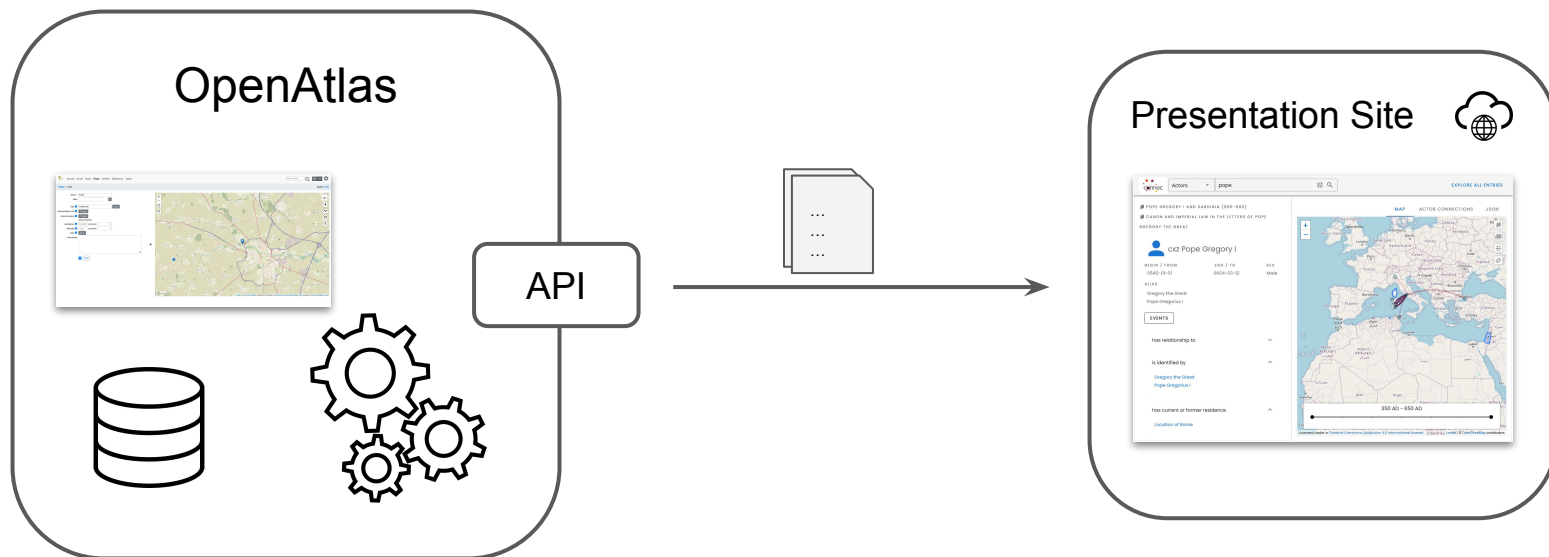
Flask

Jinja

Bootstrap



Front End – Presentation Website





Front End – OpenAtlasDiscovery



developed by Christoph Hoffmann

Leaflet


Vuetify

NuxtJS











Vue.js




Front End – OpenAtlasDiscovery


OpenAtlasDiscovery 



Items per page: 10 1-10 of 791 |< < > >|


Class	Title	Description	Begin/From	End/To
	Ach, Hans von ~	asdfsdf		
	Ader, Jörg	65		
	Adolf, Duke of Guelders	OGV 58	1438-03-12T00:00:00	
	Affligem, Abtei			
	Affligem, Geffroy von ~			
	Aggsbach, Kartäuserkloster	Aggsbach (nö. Melk, Niederösterreich)		
	Aggsbach, Prior Thomas von ~	Achspach, Prior von		
	Aichpeck, Engelbert			
	Albrecht VI.			
	Albrecht, Herzog von Sachsen	OGV 96	1443-07-31T00:00:00	

Rows per page: 10 1-10 of 791 |< < > >|

OpenAtlasDiscovery 

 **Adolf, Duke of Guelders**

 BEGIN / FROM  END / TO SEX Male
1438-03-12T00:00:00 1477-06-27T00:00:00
OGV 58

 RELATIONS

Title

crm:OA7 has relationship to

[Bourbon, Jacques de ~](#)

[Geldern, Karl von ~](#)

[Karl der Kühne, Herzog von Burgund](#)

[Burgund, Anton Bastard von ~](#)

[Egmond, Willem van ~](#)

[John I, Duke of Cleves](#)

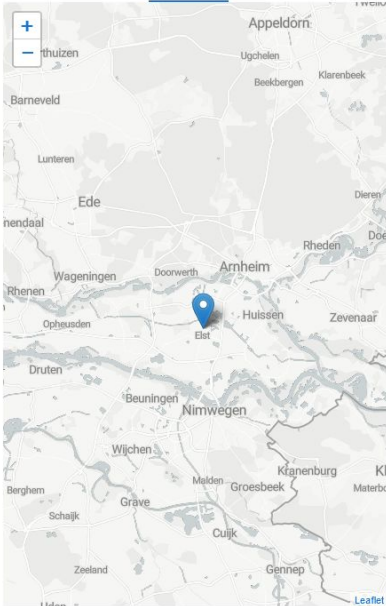
crm:P1 is identified by

[Adolf, Herzog von Geldern](#)

crm:P1071 is current or former member of

[Orden vom Goldenen Vlies](#)



MAP GRAPH JSON




Leaflet



Front End – Connec

 Actors 

[EXPLORE ALL ENTRIES](#)



- User Guide
- Map
- Actor Connections
- Case Studies
- Methodology

The CONNEC database features four letter collections (386-603 CE), including Augustine, Paulinus, Avitus, and Gregory. The database foregrounds their spatial worlds and social connections. It contains ??? letters, ??? actors and groups, and ??? locations.





Front End – Connec

connec

Actors

Search for Actors

EXPLORE ALL ENTRIES

+

-

350 AD - 650 AD

☒ Augustine (386-430)
[learn more](#)

☒ Avitus (500-518)
[learn more](#)

☐ Canon and Imperial Law in the Letters of Pope Gregory the Great
[learn more](#)

☒ Paulinus (390-420)
[learn more](#)

☒ Pope Gregory I and Sardinia (590-602)
[learn more](#)

Event Types

Sender Sex

Bearer Sex

Recipient Sex

Traveller Sex

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connec

Actors

Gregory

EXPLORE ALL ENTRIES

POPE GREGORY I AND SARDINIA (590-602)

MAP

ACTOR CONNECTIONS

JSON

Philoxenus

BEGIN / FROM

END / TO

SEX

0599-10-01

0599-10-31

Male

ALIAS

Filoxenus (PCBE Italie 21)

Philoxenus 4 (PLRE III B)

Philoxenus was a layman, who likely lived on Sardinia. He appears in a single letter sent from Pope Gregory to Marinianus (2), the...

read more

EVENTS

has relationship to

is identified by

[Filoxenus \(PCBE Italie 21\)](#)

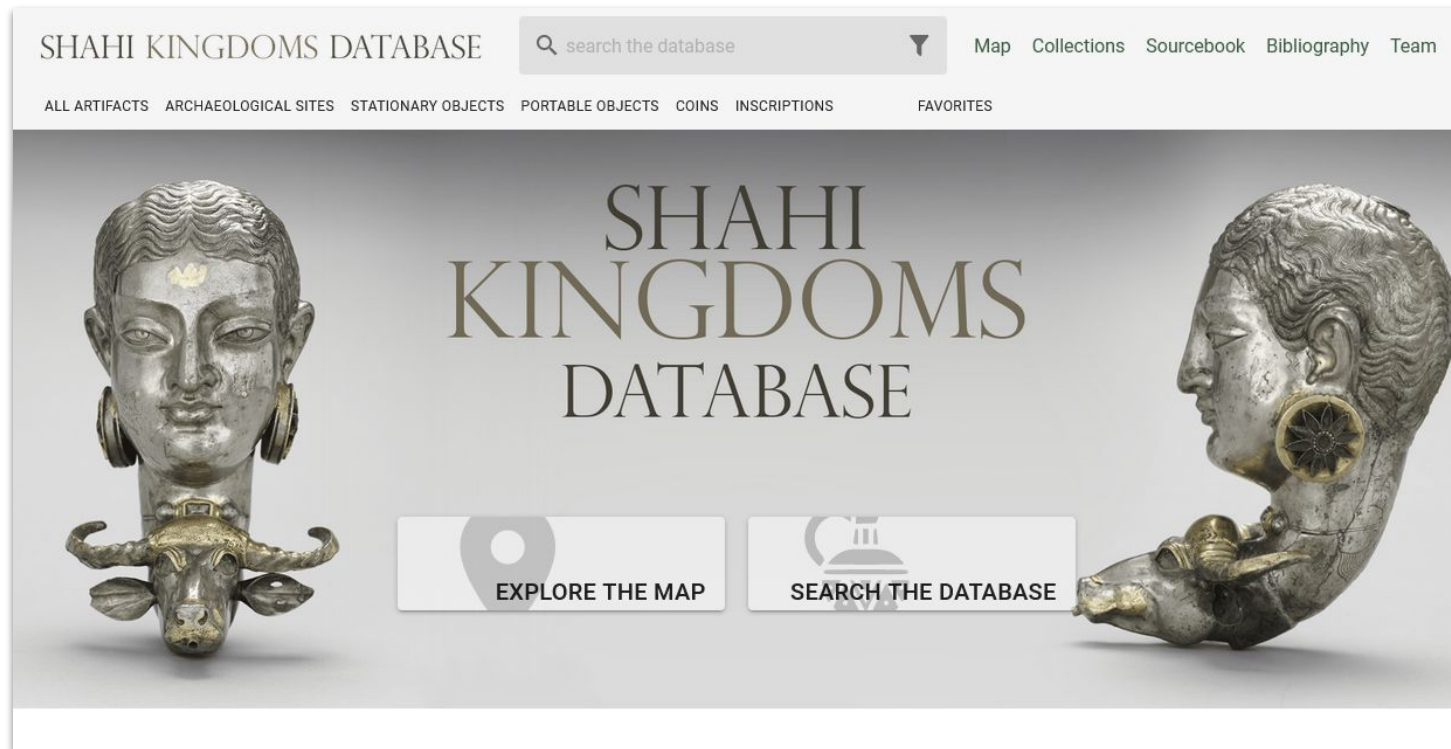
[Philoxenus 4 \(PLRE III B\)](#)

has current or former residence

Relation Types



Front End – Shahi Kingdoms Database



Leaflet

Vuetify

NuxtJS

Vue.js



Front End – Shahi Kingdoms Database

SHAHI KINGDOMS DATABASE

search the database

Map Collections Sourcebook Bibliography Team

ALL ARTIFACTS ARCHAEOLOGICAL SITES STATIONARY OBJECTS PORTABLE OBJECTS COINS INSCRIPTIONS FAVORITES

7

7th Century

AFGHANISTAN

Termez Sheberghan Mazar-e-Sharif Kunduz Taloqan Maymana Chaghcharan Heray Rud Kabul Jalalabad Peshawar Islamabad Rawalpindi Ghazni Khost Sialkot Jammu Gujranwala Sargodha Dera Ismail Khan Faisalabad Lahore Amritsar Kandahar Lashkar Gah

TABLE LIST MAP GALLERY

SHAHI KINGDOMS DATABASE

Portable

Map Collections Sourcebook Bibliography Team

ALL ARTIFACTS ARCHAEOLOGICAL SITES STATIONARY OBJECTS PORTABLE OBJECTS COINS INSCRIPTIONS FAVORITES

Attendant Figure from a Halo

800 - 900

Place of production: **Historical Northwest India** Current location: **Metropolitan Museum of Art** (1987.142.310)

Credit Line: Samuel Eilenberg Collection, Gift of Samuel Eilenberg, 1987.

Open license
Metropolitan Museum.
<https://www.metmuseum.org/art/collection/search/38992> (recent access: 07.05.2022)
All Images

Details

ARTIFACT: Statue

MATERIAL: copper alloy metal

DIMENSIONS: Height: 7.9 cm

CATEGORY OF AUTHENTICITY: B

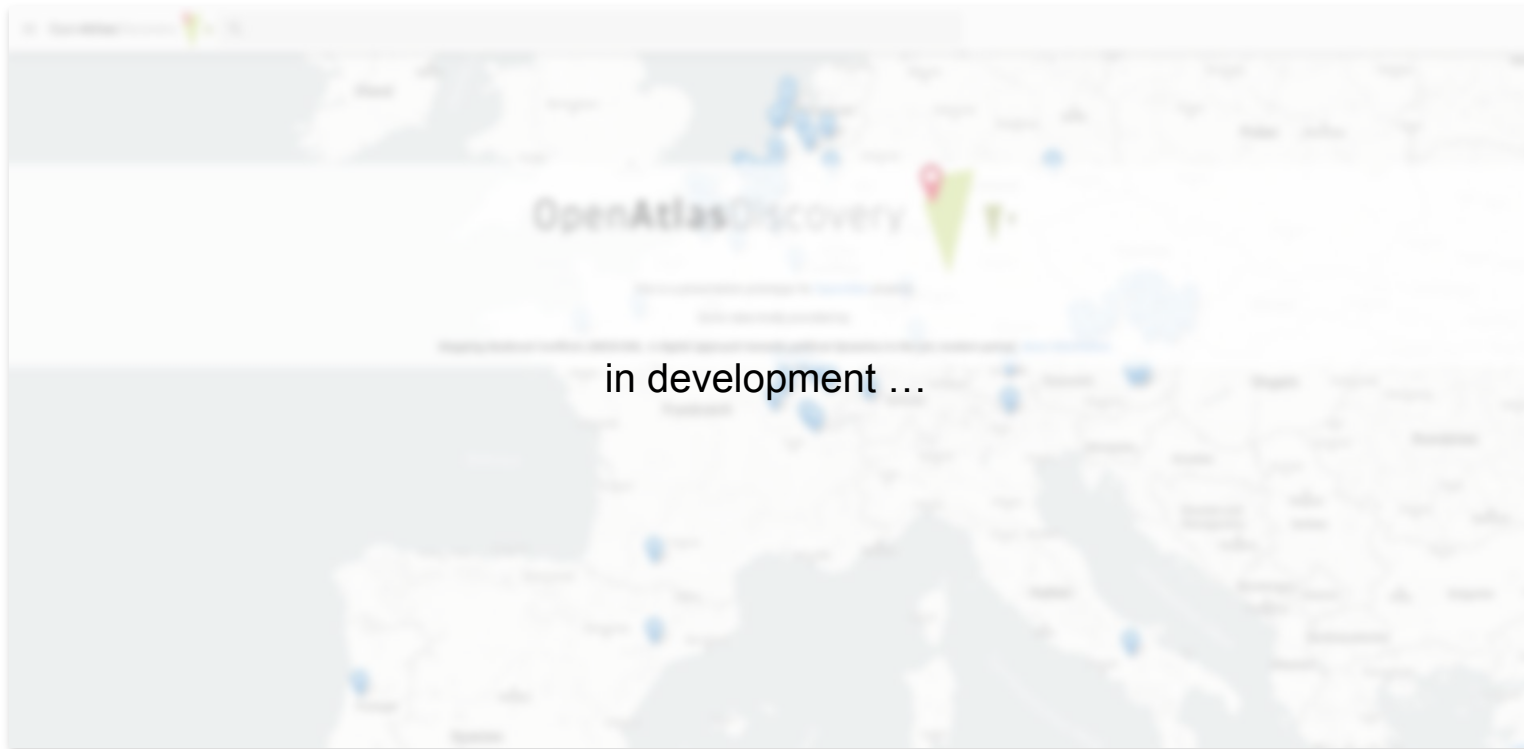
HAS INSCRIPTION: No

PLACE OF PRODUCTION: Historical Northwest India

Discover on Map



Front End – OpenAtlasDiscovery 2.0





THANADOS - Nina Richards

- Studied:
 - Medieval and Modern Times Archaeology in Bamberg (DE)
 - Biology with a focus on Biological Anthropology at the University of Vienna
- Came to DH through THANADOS
- Osteoarchaeological expertise for OpenAtlas
- Involved in RELEVEN (PI: Tara Andrews) - Data modelling and archaeology of the 11th century

THANADOS





Project:

- “go!digital next generation” call of the Austrian Academy of Sciences
- Goal: Online dissemination of all early medieval burial grounds in nowadays Austria
- Goal: State of the art presentation of the data as open access



Data source:

- Graves as most important source for Early Medieval Archaeology and Anthropology
- Settlements almost entirely missing
- (Published) sites between 600 and 1100 AD
- Catalogs and tables
- Translation of data into English



Team:



Österreichisches
Archäologisches
Institut



Nina Richards



Bernhard Koschicek



Alexander Watzinger



naturhistorisches
museum wien



Stefan Eichert



Jennifer Portschy



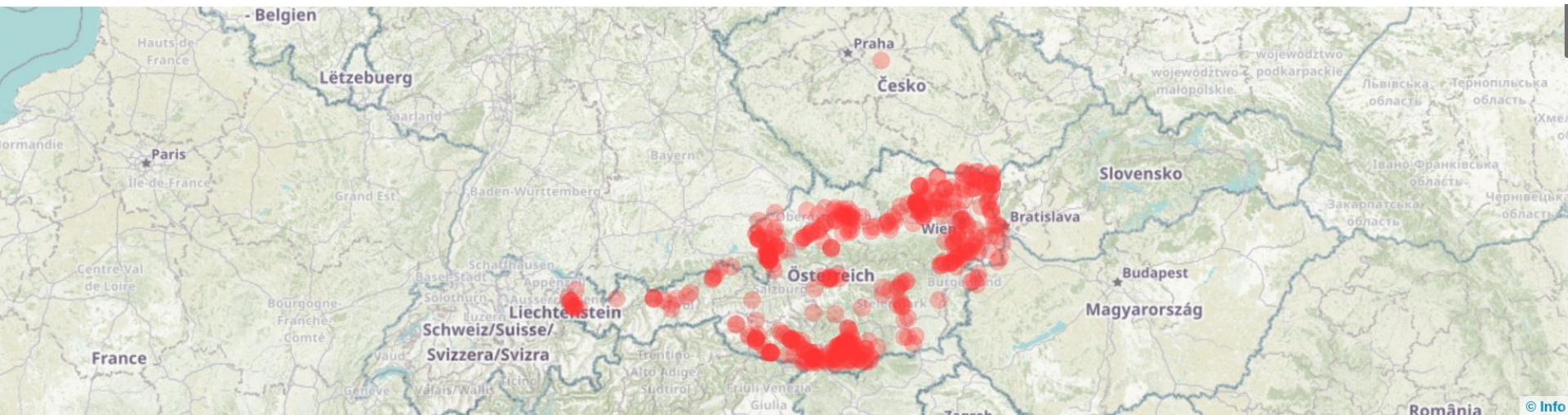
Roland Filzwieser



Sonja Mayer



Status quo:



445

Cemeteries

5280

Graves

5560

Individuals

11506

Finds

6162

Osteology Datasets

<https://thanados.net/>




Osteoarchaeological features:

- Need for an up to date way to do anthropological analyses
- Implementing those methods in OpenAtlas
- Possibility to work with projects with anthropological research questions

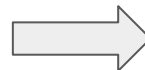



Sex estimation:

 Source Event Actor **Place** Artifact Reference Types

Burial 001 > Anthropological analyses > Sex estimation > Edit

Glabella (Skull)	Female?
Arcus superciliaris (Skull)	Female
Tuber frontalis and parietalis (Skull)	Indifferent
Inclinatio frontalis (Skull)	Female
Processus mastoideus (Skull)	Female
Relief of planum nuchale (Skull)	Not preserved
Protuberantia occipitalis externa (Skull)	Male?
Processus zygomaticus (Skull)	Female
Os zygomaticum (Skull)	Female?
Crista supramastoideum (Skull)	Not preserved
Margo supraorbitalis (Skull)	Not preserved
Shape of orbita (Skull)	Not preserved
Overall apperence (Mandible)	Not preserved
Mentum (Mandible)	Not preserved
Angulus (Mandible)	Not preserved
Margo inferior (M2) (Mandible)	Not preserved
Angle (Mandible)	Not preserved
Sulcus praeauricularis (Pelvis)	Not preserved
Incisura ischiadica major (Pelvis)	Not preserved
Angulus pubis (Pelvis)	Not preserved
Arc composé (Pelvis)	Not preserved
Os coxae (Pelvis)	Not preserved
Foramen obturatum (Pelvis)	Not preserved
Corpus ossis ischii (Pelvis)	Not preserved
Crista iliaca (Pelvis)	Not preserved



 Source Event Actor **Place** Artifact Reference Types

Burial 001 > Anthropological analyses > Sex estimation



Sex estimation - Burial 001

Ferembach et al. 1979: -1.17 - corresponds to "female"

Skull

Glabella	3 Female?	-1 = -3
Arcus superciliaris	2 Female	-2 = -4
Tuber frontalis and parietalis	2 Indifferent	
Inclinatio frontalis	1 Female	-2 = -2
Processus mastoideus	3 Female	-2 = -6
Relief of planum nuchale	3 Not preserved	
Protuberantia occipitalis externa	2 Male?	1 = 2
Processus zygomaticus	3 Female	-2 = -6
Os zygomaticum	2 Female?	-1 = -2
Crista supramastoideum	2 Not preserved	
Margo supraorbitalis	1 Not preserved	
Shape of orbita	1 Not preserved	

Mandible

Overall apperence	3 Not preserved
Mentum	2 Not preserved
Angulus	1 Not preserved
Margo inferior (M2)	1 Not preserved
Angle	1 Not preserved

Pelvis

Sulcus praeauricularis	3 Not preserved
Incisura ischiadica major	3 Not preserved
Angulus pubis	2 Not preserved



Conclusion - Advantages of OpenAtlas

- OpenAtlas is open source and completely based on open source software
- Data is structured according to the international standard of CIDOC CRM (v7.1)
- Actively developed with high quality standards in mind
- Emphasis on documentation and close contact with users
 - User manual: <https://manual.openatlas.eu>
 - Technical wiki and issue tracker: <https://redmine.openatlas.eu>
 - Public meeting protocols: https://redmine.openatlas.eu/projects/uni/wiki/Project_meetings
- API to connect with external systems
- Great synergies between projects using OpenAtlas
- Tested and proven in many productive systems and projects

A large, faint background graphic featuring a pink location pin on a light green map, with several green triangles of varying sizes and opacities scattered around it.

Thank you for your kind attention!

OpenAtlas:

Web: <https://openatlas.eu>

GitHub: <https://github.com/craws/OpenAtlas>

Twitter: @OpenAtlas_eu