

# OpenAtlas



## in Action

### Mapping Data, Connecting Knowledge

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Alexander Watzinger, Bernhard Koschiček-Krombholz, Katharina Wünsche, Olivia Reichl

# OpenAtlas

## A Database System for the Humanities and Beyond

# Alexander Watzinger (Alex)

- Lead developer of [OpenAtlas](#)
- Since 2017 at the [ACDH-CH](#)
- Loves open source and scientific projects



INDIGO workshop 2021

# OpenAtlas



- Project site: <https://openatlas.eu>
- Open source, browser based database software
- Acquire, edit and manage research data
- Based on the model of [CIDOC CRM](#)
- Initiated over 10 ago by Stefan Eichert
- Mainly developed at the [ACDH-CH](#) / [ÖAW](#)

# Mission Statement

- Open source – open access
- Transparent workflow and communication
- High-quality data integrity and coding standards
- Usability
- Interoperable: CIDOC, API, FAIR principles, ext. references

# OpenAtlas Collaborations

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



Moving Byzantium



# Development

- Pure open source technology
- Releases about every month
- Close cooperation with users
- No project branching
- Coding standards, tests



python™

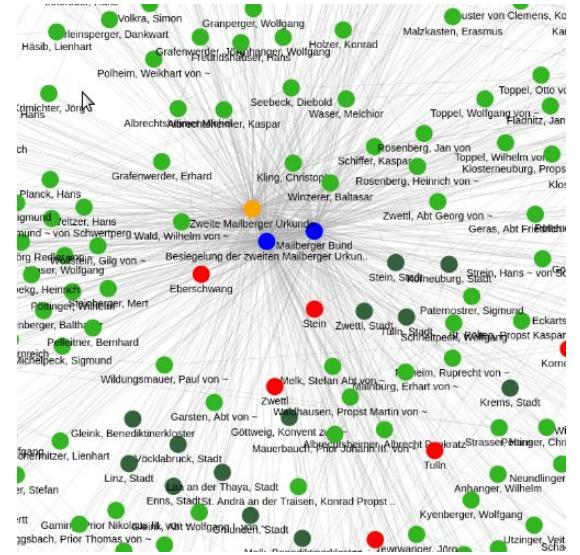


# Structured Data - Aim

- Search
- Compare
- Merge
- Research questions

# Structured Data - Workflow

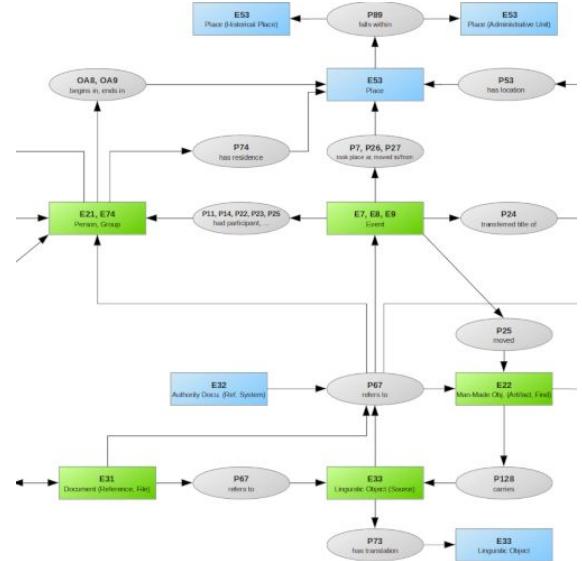
- Identify classes for entities
- Add attributes
- Link entities -> network
- Challenge: Balance between easy data entry and acquiring detailed information



<https://demo.openatlas.eu/overview/network/>

# CIDOC Conceptual Reference Model

- International standard (ISO)
- From the 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



<https://demo.openatlas.eu/overview/model>

# Features - Data Enrichment

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

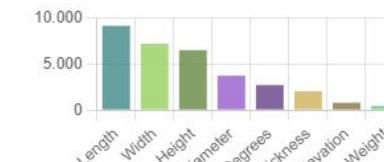
**Dimensions** ^

Type to search + Type Edit Delete

**Azimuth 0**  
**Degrees 2,700**  
▫ **Diameter 2,735 (983)**  
    Bottom diameter 317  
    Max Diameter 321  
    Min Diameter 85  
    Top Diameter 260  
▫ **Distance 0**  
    Elevation 801  
▫ **Height 6,336 (150)**  
    Height max 75  
    Height min 75  
▫ **Length 8,756 (356)**

**Classes:** Artifact, Feature, Place, Stratigraphic unit  
Multiple linked entities: [show](#)  
Untyped entities: [show](#)

**Description**  
Physical dimensions like weight and height.



Dimension	Value
Length	8,756 (356)
Width	2,735 (983)
Height	6,336 (150)
Diameter	2,735 (983)
Degrees	2,700
Thickness	75
Elevation	801
Weight	0

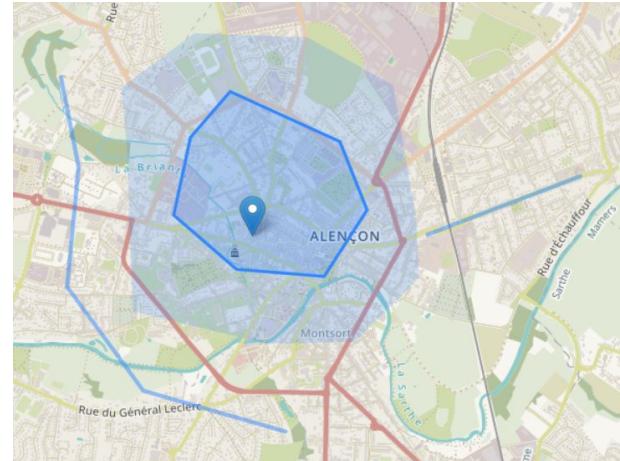
# Features - Solutions for Uncertainty

Time

Begin	1011	01	01	comment
	1020	12	31	

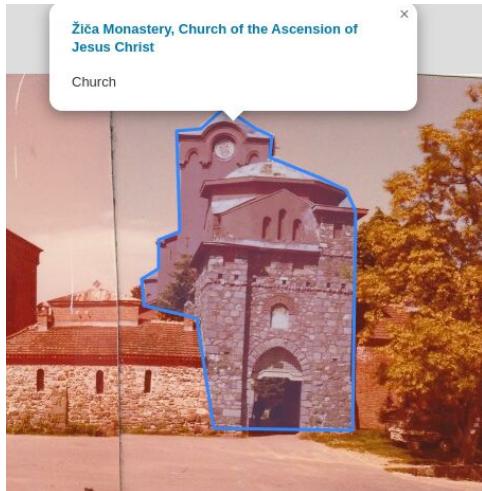
End	1425	08	01	destruction
	1425	10	31	

Space



# Features - Annotations

## Image



## Text

Annotate

**Text annotation** is the practice and the **result** of adding a note or gloss to a text, which **may include highlights** or underlining, comments, footnotes, tags, and links. Text annotations can include notes written for a reader's private purposes, as well as shared annotations written for the purposes of collaborative writing and editing, commentary, or social reading and sharing. In some fields, text annotation is comparable to metadata insofar as it is added post hoc and provides information about a text without fundamentally altering that original text.<sup>[1]</sup> Text annotations are sometimes referred to as marginalia, though some reserve this term specifically for hand-written notes made in the margins of books or manuscripts. Annotations have been found to be useful and help to develop knowledge of English literature.

Annotations

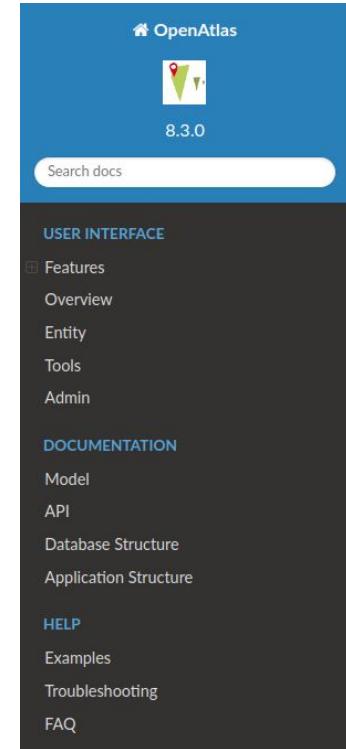
**annotation**  
Entity ID: 50625 | Comment: An interesting remark and a linked entity.

**may include highlights**  
Comment: A remark without a linked entity

**result**  
Entity ID: 132486

# Features - Documentation

- Project website: [openatlas.eu](http://openatlas.eu)
- Code on [GitHub](#)
- Extensive [User Manual](#)
- Technical [Wiki](#), [installation guide](#)
- [Ticket system](#) and [roadmap](#) for planning
- Public meeting [protocols](#)



# Features - and a lot more

- User management
- Archaeological finds with detailed mapping
- Fileupload + IIIF integration
- Data integrity checks
- ... see the [Features](#) page in manual

# Data Exchange and Semantic Connectivity in OpenAtlas

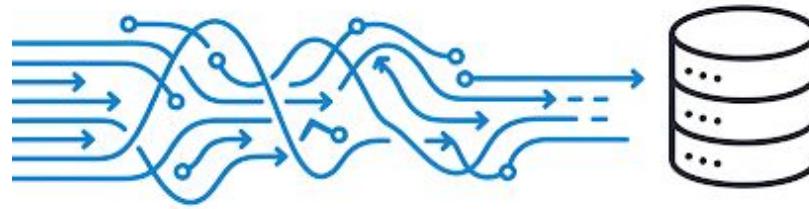
Bernhard Koschiček-Krombholz

# Bernhard Koschiček-Krombholz

- Studied
  - *Computer Science* at Applied University Technikum Vienna
  - *History* at University of Vienna
- Since 2019 developer at [ACDH-CH](#)
- Responsibilities
  - API
  - Backend development
  - Server administration

# Getting data into OpenAtlas

- Manual Entry
- CSV Import
- Custom Scripts



# Manual Entry via User Interface

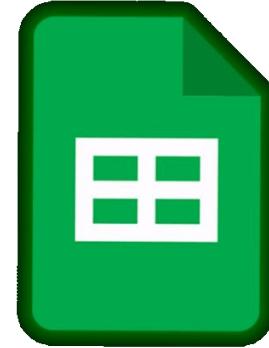


- Primary & intended method
- User-friendly web forms
- Ideal for detailed, individual records & ongoing work
- Ensures data quality using built-in controls

<https://lmu.openatlas.eu/>



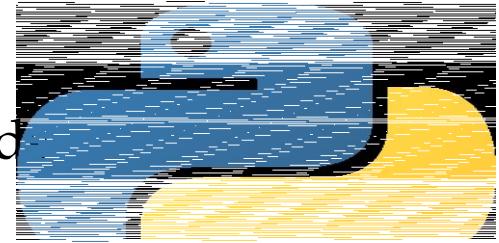
# CSV Import via Admin Area



- For importing *bulk*, structured data
- Uses standardized CSV (Comma Separated Values) files
- Requires specific file format/structure
- Check out the [Manual](#)

# Custom Python Scripts

- Maximum flexibility for complex/custom needs
- Requires:
  - Python programming skills
  - Deep knowledge of OpenAtlas internals (code, database)
- Use with caution; not for typical users



# Getting Your Research Data Out

- Analysis, Visualization, Sharing, Integration
- **Methods:**
  - SQL Access (Direct Database - Advanced)
  - CSV Export (Simple Tables)
  - Web API (Flexible & Structured Data)



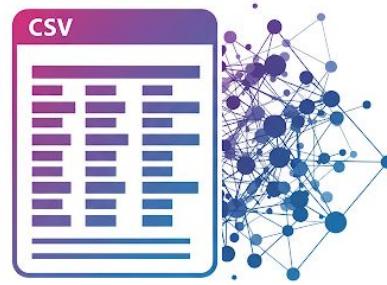
# Direct Database Access (SQL)



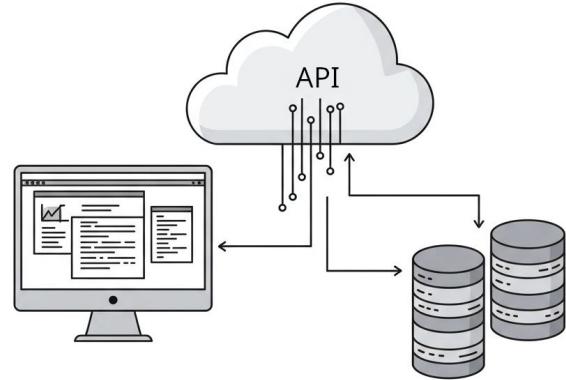
- Most powerful, most complex
- Direct access to the raw PostgreSQL database
- Requires SQL knowledge & database structure understanding
- Use Cases: Backups, development, very complex queries

# CSV Export

- Simple text files (Comma Separated Values)
- Direct export from web interface
- Good for simple lists & tables
- Network data (nodes/edges for Gephi)
- **Limitations:**
  - "Flattens" complex relationships
  - Can lose context/metadata



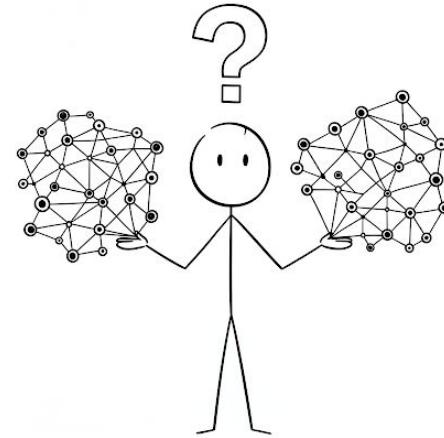
# The Web API



- **Flexibility:** Ask for specific data using filters/queries
- **Structure:** Richer formats (like JSON) preserve relationships better
- **Automation:** Allows scripting for analysis/integration
- **Connectivity:** Foundation for linking data across systems

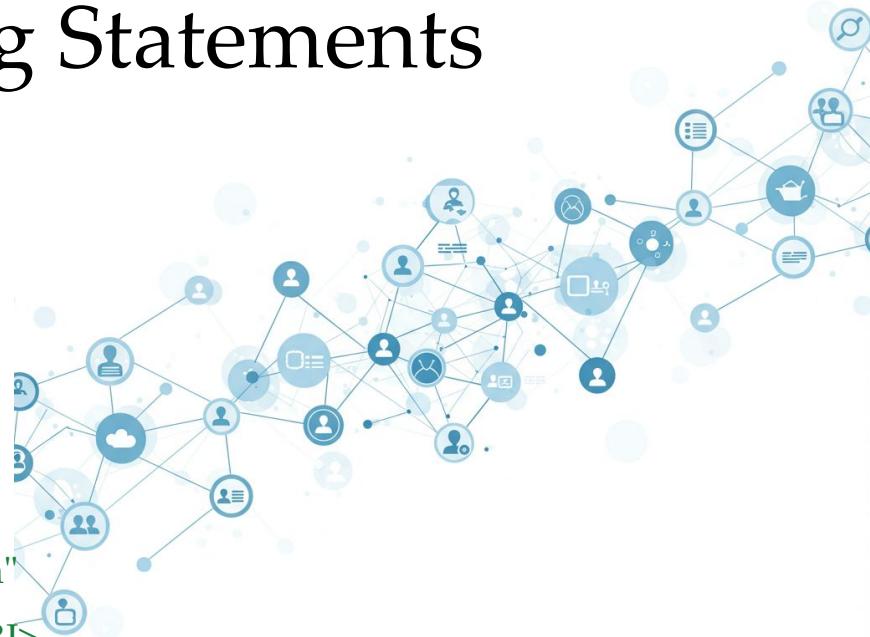
# Why Care About "Linked Data"?

- **Today's Web**
- **Semantic Web Vision**
- **Linked Data Principles:**
  - Use **URIs** as unique IDs for things
  - Make these URIs look available online (HTTP)
  - Provide structured data (using **RDF**) when looked up
  - Include **links** (other URIs) to related data



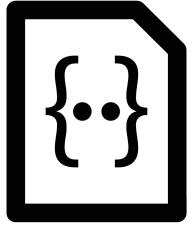
# Core Idea: RDF - Making Statements

- **RDF = Resource Description Framework**
- **Data Model:** Simple statements called **Triples**
  - **Subject:** The thing
  - **Predicate:** The property/relationship
  - **Object:** The value or another thing
- **Example:** <Munich\_URI> <population> "1.5 Million"
- **Example:** <Munich\_URI> <country> <Germany\_URI>
- **Result:** A network ('graph') of connected facts.



# Web-Friendly Linked Data: JSON-LD

- **JSON:** Very common format for web data.
- **JSON-LD (JSON for Linking Data):** Puts RDF triples into JSON structure.
- **Uses a @context:** Maps simple JSON keys (like "name") to full URIs (like <http://schema.org/name>).
- **Benefit:** Embeds meaning into familiar JSON; good for APIs & web apps.

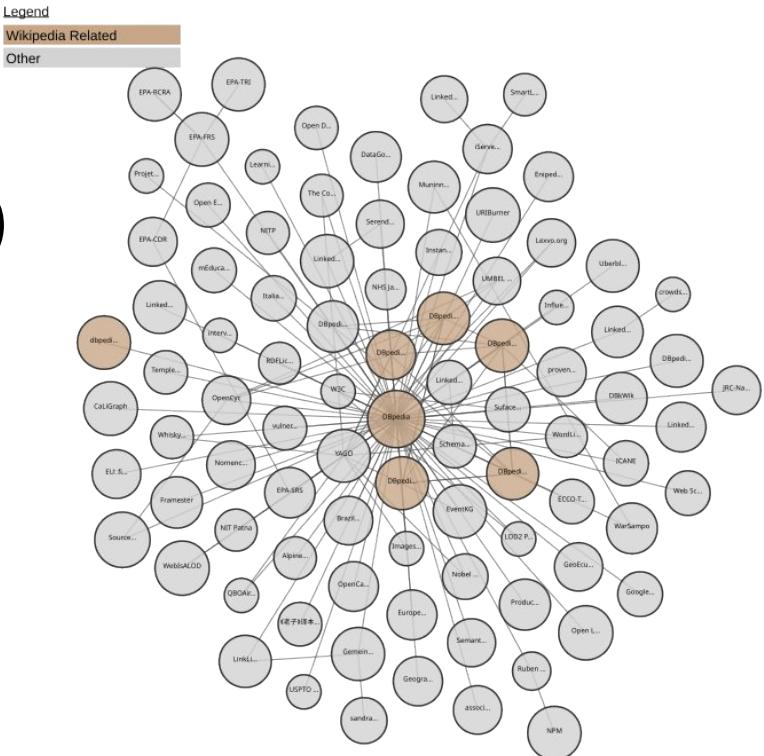


# Conceptual Example

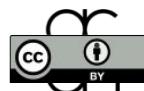
```
{  
  "@context": {  
    "name": "http://schema.org/name",  
    "population": "http://example.org/prop/population",  
    "country": "http://example.org/prop/country"  
  },  
  "@id": "http://example.org/entity/Munich", // The Subject URI  
  "name": "Munich",  
  "population": 1500000, // Literal Object  
  "country": { "@id": "http://example.org/entity/Germany" } // Link Object  
}
```

# Linked Open Data (LOD)

- LOD = Linked Data + Open License
  - **Open License:**
    - Permits free use
    - reuse
    - distribution
  - **Result:**
    - Global, interconnected, accessible Web



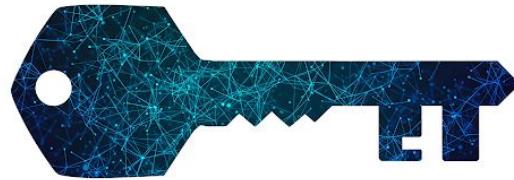
The Cross-Domain Linked Open Data Cloud from lod-cloud.net





# Why LOD Matters for Digital Humanities

- Easier **Data Integration** (combine diverse sources).
- Enhanced **Discoverability** (follow links to related info).
- Build **Smarter Applications** (software understands relationships).
- Increased **Transparency & Reuse** of research data.

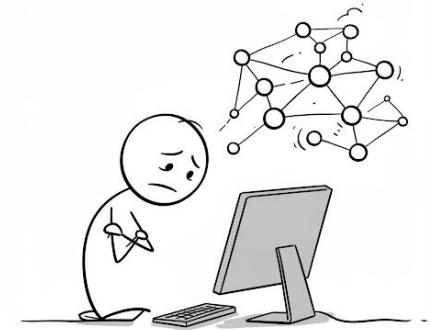


# Digital Humanities Key Aggregators/Hubs

- **Europeana:** European cultural heritage
- **Wikidata:** Collaborative knowledge base (like Wikipedia for data)
- **Pelagios Commons:** Linking historical places
- **Getty Vocabularies:** Standard terms/IDs for art, places, names

# LOD: It's Powerful, But Not Always Easy

- **Complexity:** Learning curve
- **Data Quality:** Consistency is hard across sources
- **Link Rot:** Links can break over time
- **Tooling & Expertise:** Need specialized tools & skills
- **Sustainability:** Keeping data & URIs maintained long-term



Quelle Ereignis Akteur Ort Artefakt Referenz Typ Datei

Suchbegriff  CA DE EN ES FR

Ort > + Ort OpenAtlas 8.11.0

Name \* Munich

Alias München

Typ Ändern

Administrative unit Ändern

Case study \* Other Ändern

Historical place Ändern

GeoNames 2867714 exact match

Wikidata Q1726 exact match

Datum Anzeigen

Beschreibung

Anlegen Anlegen und weiter Anlegen und weiter mit Feature

Centerpoint  
Setze einen Marker auf die Position, an der sich das physikalische Objekt befindet

Munich

Munich (2867714), imported from GeoNames

Easting  
decimal degrees

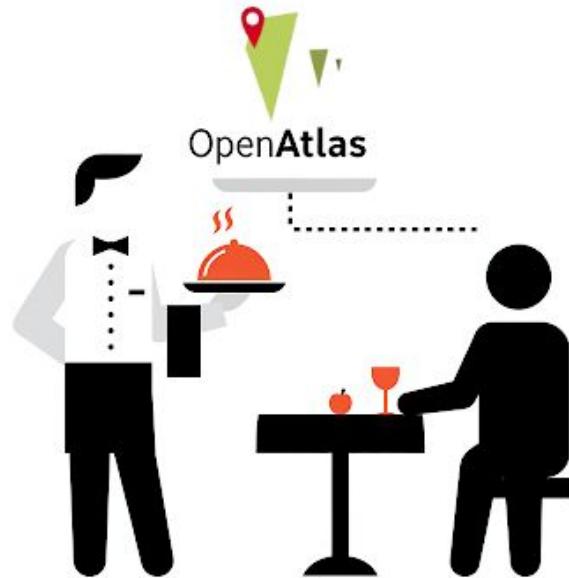
Northing  
decimal degrees

Leaflit | © OpenStreetMap contributors, Tiles style by Humanitarian OpenStreetMap Team hosted by OpenStreetMap France

<https://lmu.openatlas.eu/insert/place>

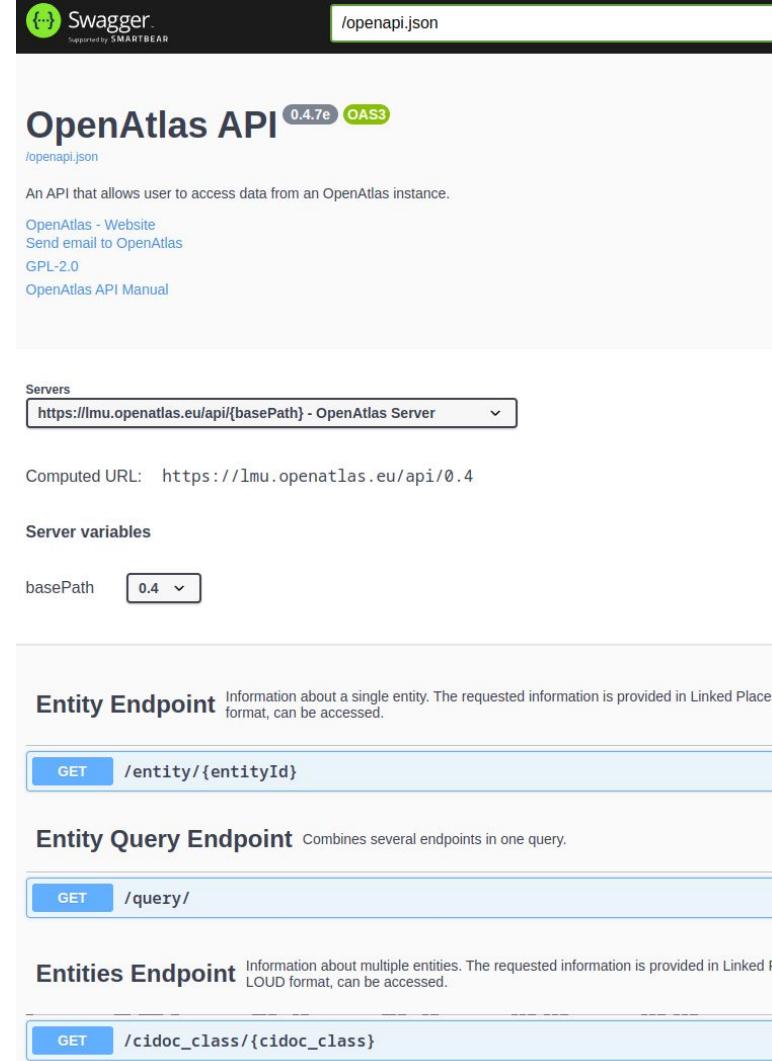
# Back to APIs: The Practical Connection

## Application Programming Interface



# Using the OpenAtlas API

- Specific URLs for specific actions
  - [/api/entity/{id}](#)
  - [/api/latest/](#)
  - [/api/geometric\\_entities/](#)
  - [/api/type\\_overview/](#)
  - [/api/chained\\_events/{id}](#)
  - [/api/search/place/{term}](#)
- Documentation: [Manual](#) or [Swagger](#)



The screenshot shows the OpenAtlas API documentation page on Swagger. At the top right, there is a link to [/openapi.json](#). Below the header, the title "OpenAtlas API" is displayed with a version of "0.4.7e" and an "OAS3" badge. A sub-link to [/openapi.json](#) is also present. A brief description states: "An API that allows user to access data from an OpenAtlas instance." Below the description are links to "OpenAtlas - Website", "Send email to OpenAtlas", "GPL-2.0", and "OpenAtlas API Manual".

On the left side, there is a "Servers" dropdown menu set to "https://lmu.openatlas.eu/api/{basePath} - OpenAtlas Server". Below it, the "Computed URL:" is shown as "https://lmu.openatlas.eu/api/0.4".

Under "Server variables", there is a "basePath" dropdown menu set to "0.4".

The main content area contains several API endpoint definitions:

- Entity Endpoint**: Information about a single entity. The requested information is provided in Linked Places format, can be accessed.
  - GET** [/entity/{entityId}](#)
- Entity Query Endpoint**: Combines several endpoints in one query.
  - GET** [/query/](#)
- Entities Endpoint**: Information about multiple entities. The requested information is provided in Linked PLoud format, can be accessed.
  - GET** [/cidoc\\_class/{cidoc\\_class}](#)

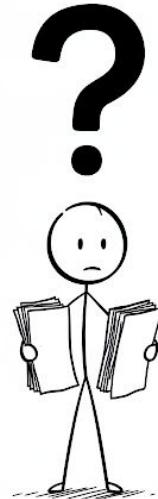


# Parameters: Customizing Your Request

- Customize/filter requests
- Common Types:
  - **Path Parameters** `/api/entity/{id}`
  - **Query Parameters** `/api/entity/{id}?format=turtle&limit=30`
- Check [Swagger](#) docs for options per endpoint

# Why Use the API in Digital Humanities?

- Bulk Data Extraction
- Network Analysis
- Custom Visualizations
- Integration



# API Evolution: Versioning and Planning

- APIs evolve (fixes, features)
- Changes can break dependent tools
- **Semantic Versioning (v1.2.3):** Standard for changes
  - **MAJOR** (v1 -> v2): Breaking changes (code adaptation needed)
  - **MINOR** (v1.1 -> v1.2): New features (backward-compatible)
  - **PATCH** (v1.1.1 -> v1.1.2): Bug fixes (backward-compatible)
- **Key:** Pay attention to API version; breaking changes are usually announced.

# Key Takeaways & Where to Explore

- **Getting Data In:**
  - Manual
  - CSV
  - Scripts
- **Getting Data Out:**
  - SQL
  - CSV
  - API



- **APIs enable:**

Bulk extraction, Network Analysis, Custom Visualizations, Integration.
- **Linked Data:**

Provides principles for more meaningful, connected web data (URIs, RDF, Links).
- **Explore:**

Check out [Manual](#) & [Swagger](#)

# OpenAtlas Discovery – A Template for Sharing and Visualizing Research Data

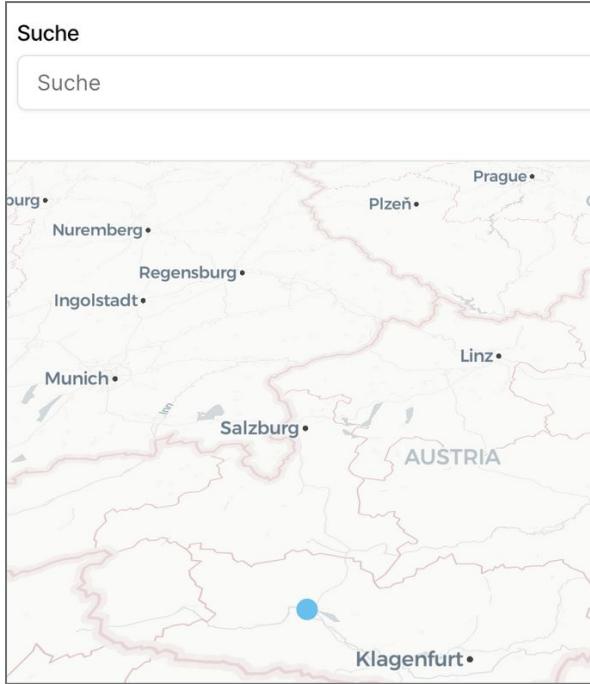
# OpenAtlas Discovery

Presentation site for OpenAtlas projects

Demo: <https://frontend-demo-dev.openatlas.eu/>

- Currently under development
- Open source, accessible via [GitHub](#)
- Goal: make project data and results available to a wider audience

# 2 Parts



## Team

Fugiat quis anim mollit sit nulla do dolore dolor eu  
reprehenderit proident eu tempor est adipisicing  
cupidatat adipisicing. Eiusmod aliquip magna dol  
non sint eu dolor.



**Stefan Eichert**

Stefan is the initiator and master mind behind the OpenAtlas project. His main research fields

# Features

**Accessible**

**Visual**

**Configurable**

# Current Development

- CMS (Content-Management-System)
- Map visualization for movements
- Network visualization for linked data
- Detail views for different categories (persons, places, events)



AUSTRIAN  
ACADEMY OF  
SCIENCES

Writing in EN ▾ Fill in from another locale ▾

FIRST NAME (OPTIONAL)

LAST NAME

TITLE (OPTIONAL)

IMAGE (OPTIONAL)

Choose an image

Insert from URL

SHORT BIOGRAPHY

B I <> ⌂ H, ¶ :≡ ½≡ +

COLORS

BRAND

#b8cf5b

GEOJSON FEATURES

#69c0ef

DEFAULT LOCALE

English

LOGOS

LOGO (LIGHT MODE)

Choose different image

Replace with URL

Remove image

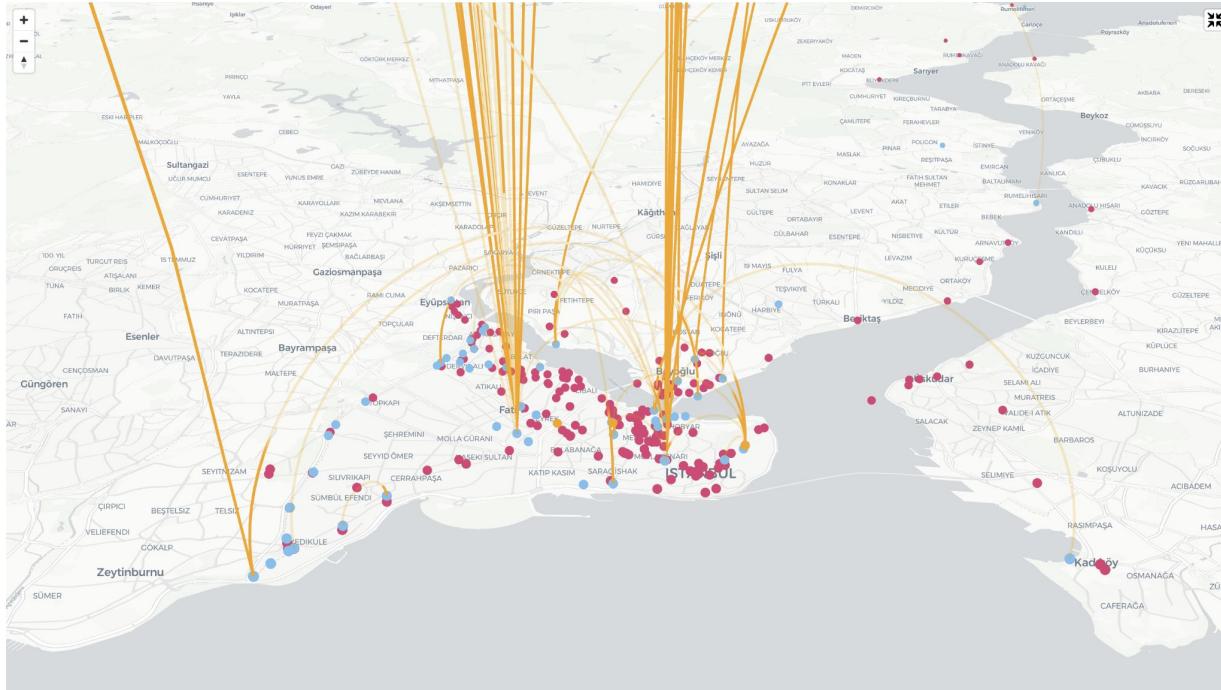
Logo in light mode

LOGO (DARK MODE)



# Current Development

- ✓ CMS (Content-Management-System)
- Map visualization for movements
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- Detail views for different categories (persons, places, events)



<https://approaching-byzantium.openatlas.eu/>

# Current Development

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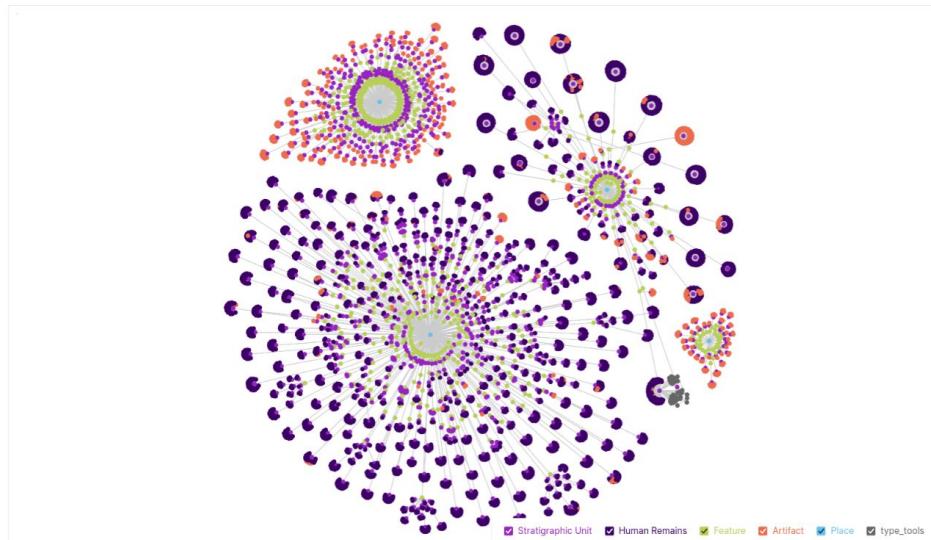
[Home](#) [Data](#) [Map](#) **Network** [Team](#) [About the project](#)

DE | EN

Search

Search

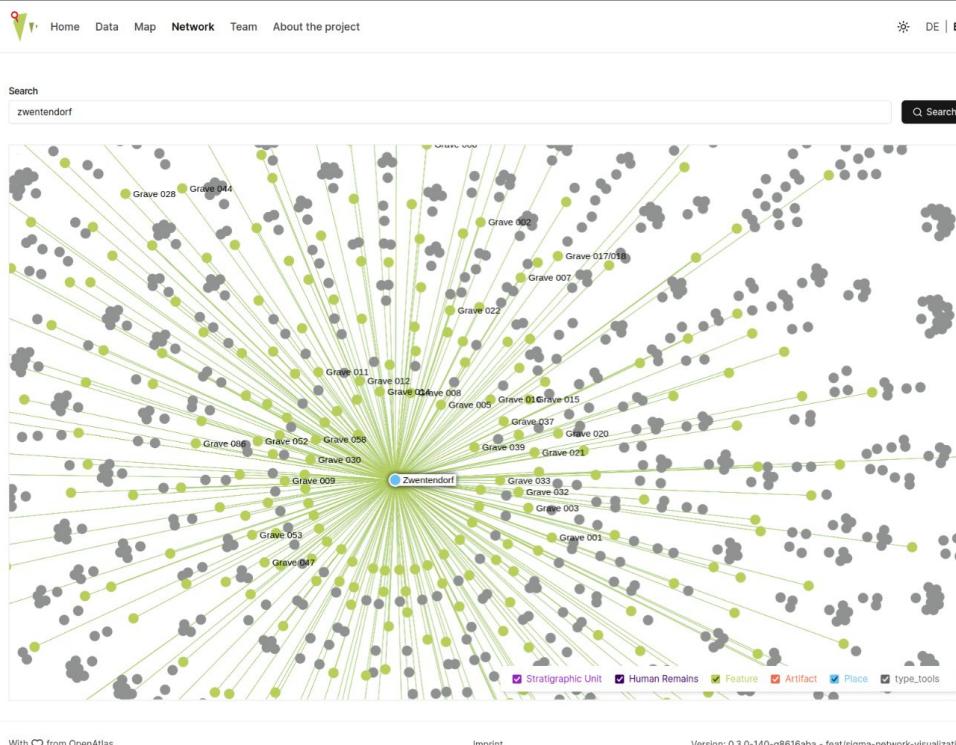
Search



With ❤ from OpenAtlas

Imprint

Version: 0.3.0-140-g8616aba - feat/sigma-network-visualization

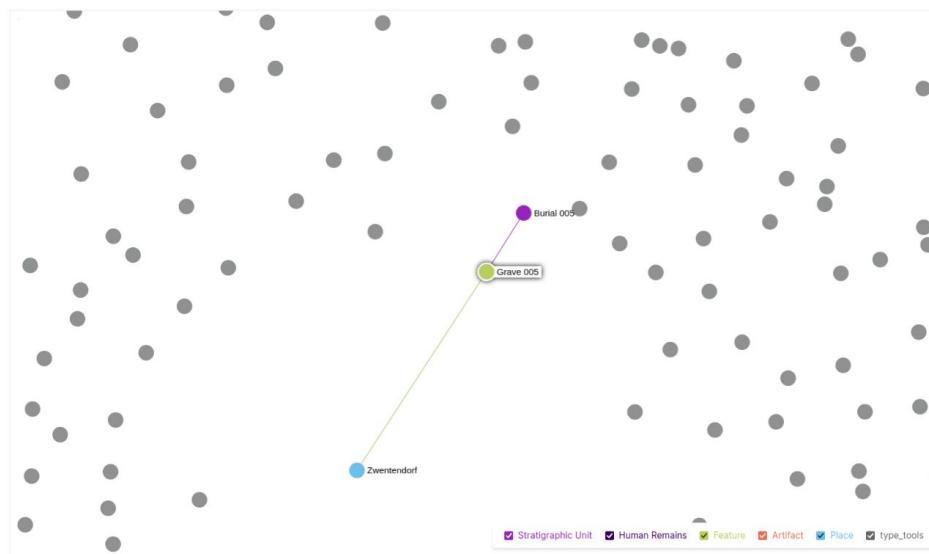




## Search

Search

Search



With ❤ from OpenAtlas

Imprint

Version: 0.3.0-140-g8616aba - feat/sigma-network-visualization

# Current Development

- ✓ CMS (Content-Management-System)
- ✓ Map visualization for movements
- ✓ Network visualization for linked data
- Detail views for different categories (persons, places, events)

Feature

## Event

Alias 1, Alias 2, Alias 3

No known calendar dates

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut et massa mi. Aliquam in hendrerit urna.

Single Grave	Height	Length	Width	Stone Placement	Flat Grave
					

< Preceding: EventName      Superceeding: EventName >

Parent-event title Dates

Description: Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut et massa mi.

Sub-Events X

Sub-Event 1

Actors X

Title	Involvement	From - Till

Details X

TITLE	BIBLIOGRAPHY
Some Property	Piccotti 1976
STRATIGRAPHIC UNIT	
Burial 01/72	

Feature

## Actor

Alias 1, Alias 2, Alias 3

No known calendar dates

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut et massa mi. Aliquam in hendrerit urna.

Single Grave	Height	Length	Width	Stone Placement	Flat Grave
					

Important Places Relations

Location	Title	Residency	From - Till	Role	Title	Involvement	From - Till

Feature

## Group

Alias 1, Alias 2, Alias 3

No known calendar dates

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut et massa mi. Aliquam in hendrerit urna.

Single Grave	Height	Length	Width	Stone Placement	Flat Grave
					

Important Places Relations

Location	Title	Residency	From - Till	Role	Title	Involvement	From - Till

Members X

Title	Involvement	From - Till

[Startseite](#)[Daten](#)[Karte](#)[Netzwerk](#)[Team](#)[Über das Projekt](#)

DE | EN

# Live Demo

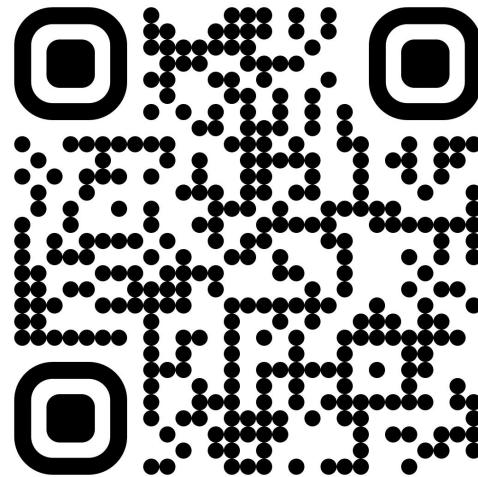


## OpenAtlas Discovery

Das ist eine Demo für [OpenAtlas Discovery](#), eine Präsentationsseite für [OpenAtlas](#). Die Demodaten wurden freundlicherweise bereitgestellt von: **THANADOS** - Die Anthropologische und Archäologische Datenbank von Sepulturen

[Daten anzeigen](#)[Karte anzeigen](#)

THANADOS (Die Anthropologische und Archäologische Datenbank von Sepulturen) beschäftigt sich mit der digitalen Sammlung und Darstellung frühmittelalterlicher Friedhöfe im heutigen Österreich.



Questionnaire  
for tomorrow's  
workshop



<https://forms.gle/AAZsVzjmHyEFwTYn6>

# Thank you!

# OpenAtlas

