

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

The logo for MAMEMS, featuring the word "MAMEMS" in a stylized blue font with a small triangle above the first 'M'.The logo for "Approaching Byzantium", with the words "APPROACHING" and "BYZANTIUM" stacked vertically, separated by a series of vertical red lines of varying heights.The logo for MEDCON, featuring the word "MEDCON" in a bold, black, sans-serif font, with a colorful, abstract graphic of overlapping red, yellow, and blue lines to the left.The logo for FemCare Vienna, featuring a stylized profile of a woman's head in purple and white, with the text "FemCare Vienna" to its right.The logo for "Moving Byzantium", with the text "Moving Byzantium" in a black, sans-serif font, and a red arrow pointing to the right above it.The logo for bITEM, featuring a blue and green geometric logo to the left of the word "bITEM" in a blue, sans-serif font.The logo for "connec", featuring a network of colored dots (red, purple, green, yellow) connected by lines, with the word "connec" in a black, sans-serif font below it.The logo for THANADOS, featuring the word "THANADOS" in a bold, black, sans-serif font, with a small skull icon to the right of the 'S'.The logo for acch, featuring the letters "acch" in a stylized, lowercase, black font.

# Development

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



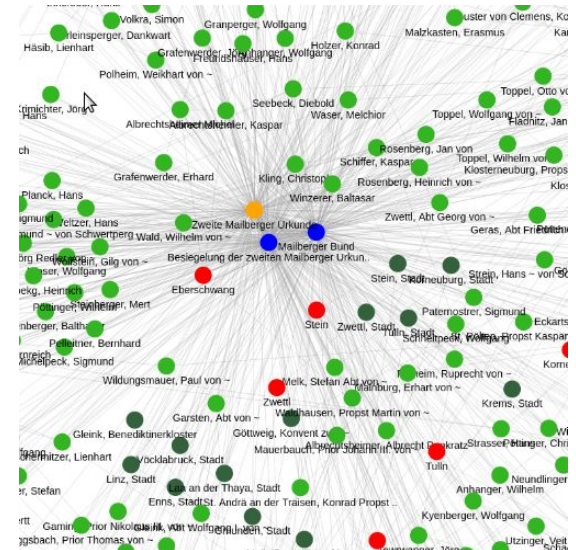
# Structured Data - Aim

- Search
- Compare
- Merge
- Research questions



# Structured Data - Workflow

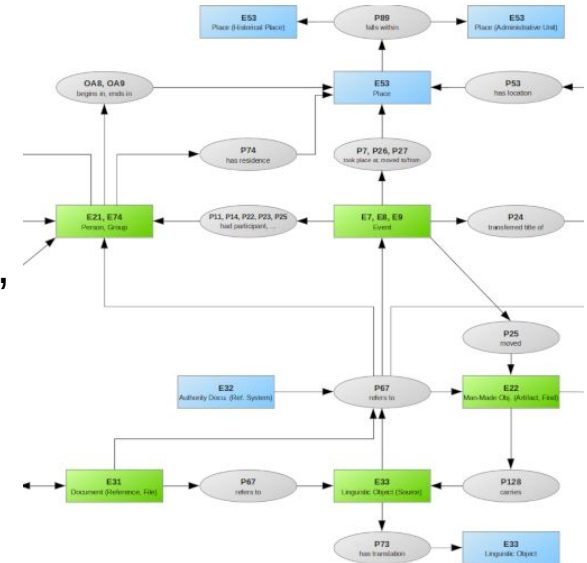
- Identify classes for entities
- Add attributes
- Link entities -> network
- Challenge: Balance between easy data entry and acquiring detailed information



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

# CIDOC Conceptual Reference Model

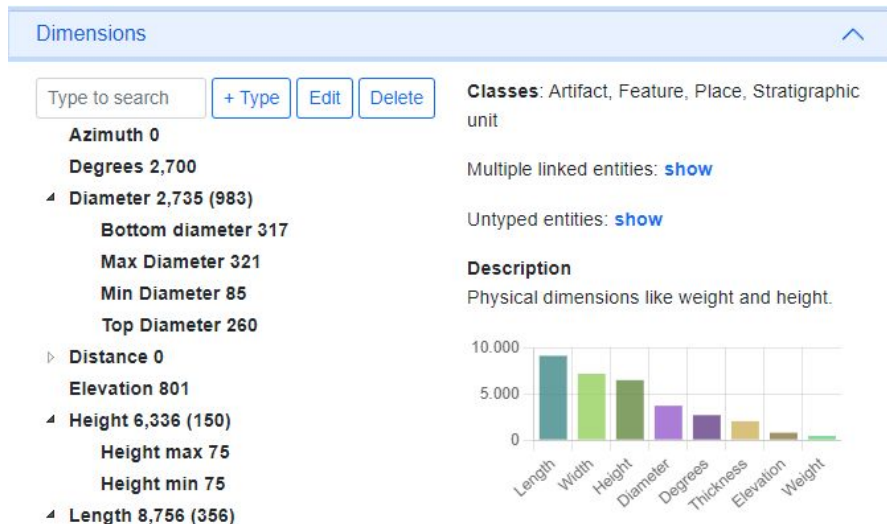
- International standard (ISO)
- From the CIDOC CRM Special Interest Group
- Specifies classes for entities like actor, source, event, place and rules how to link them
- Stored in an object oriented network



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

# Features - Data Enrichment

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

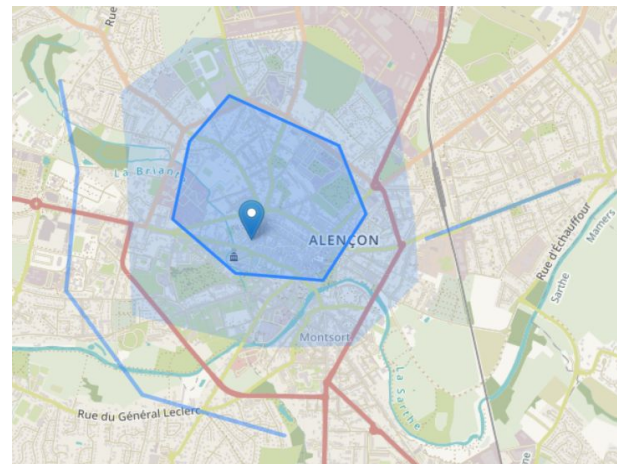


# Features - Solutions for Uncertainty

## Time

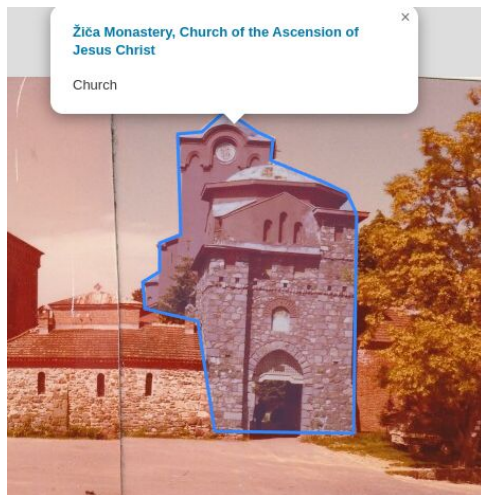
|       |      |    |    |             |
|-------|------|----|----|-------------|
| Begin | 1011 | 01 | 01 | comment     |
|       | 1020 | 12 | 31 |             |
| End   | 1425 | 08 | 01 | destruction |
|       | 1425 | 10 | 31 |             |

## Space



# Features - Annotations

## Image



## Text

Annotate

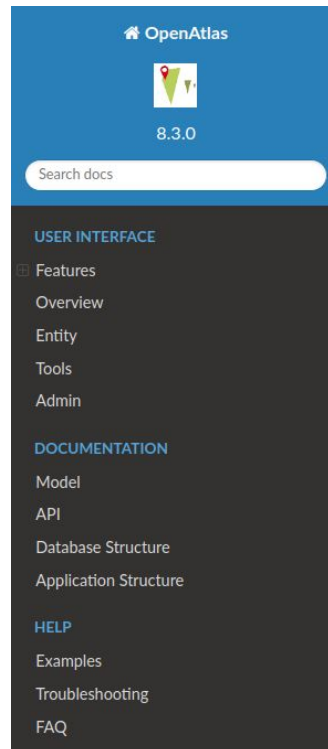
Text **annotation** is the practice and the **result** of adding a note or gloss to a text, which **may include highlights** or underlining, comments, footnotes, tags, and links. Text annotations can include notes written for a reader's private purposes, as well as shared annotations written for the 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.[1] 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

|   |     |
|---|-----|
| <b>annotation</b><br>Entity ID: 50625   Comment: An interesting remark and a linked entity. | ✎ 🗑 |
| <b>may include highlights</b><br>Comment: A remark without a linked entity                  | ✎ 🗑 |
| <b>result</b><br>Entity ID: 132486  | ✎ 🗑 |

# Features - Documentation

- Project website: [openatlas.eu](https://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

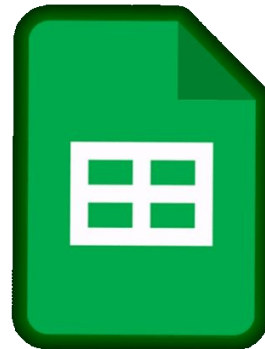




# Manual Entry via User Interface

- 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/>

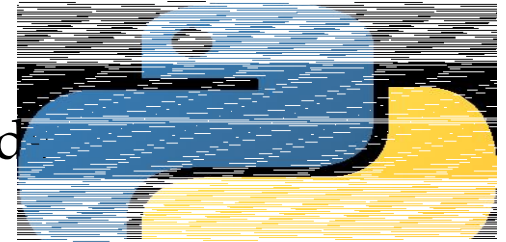


# CSV Import via Admin Area

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

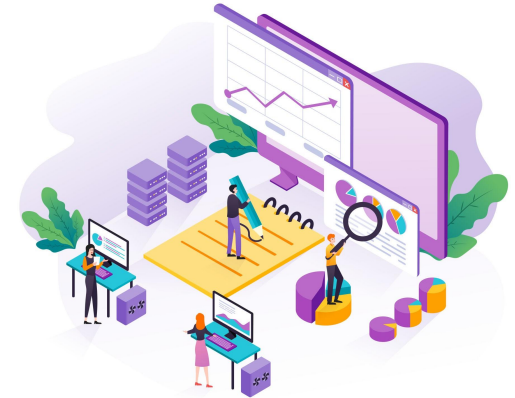
# Custom Python Scripts

- 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)



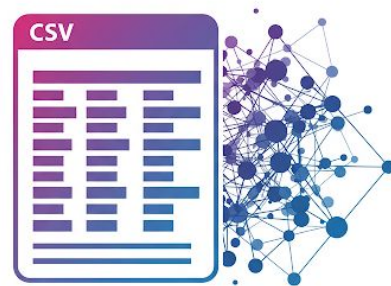
# Direct Database Access (SQL)

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



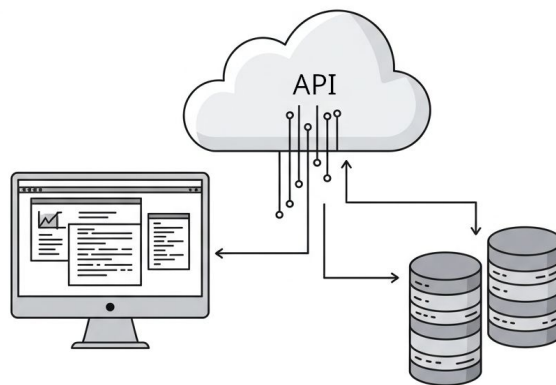
# CSV Export

- 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





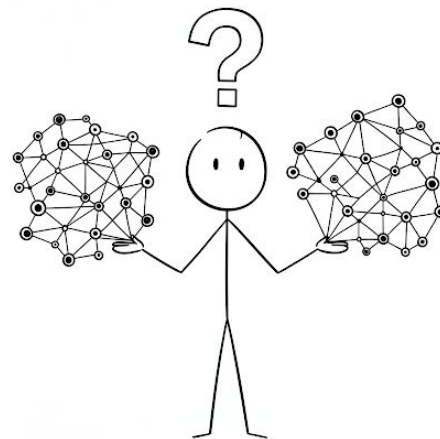
# The Web API



- **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

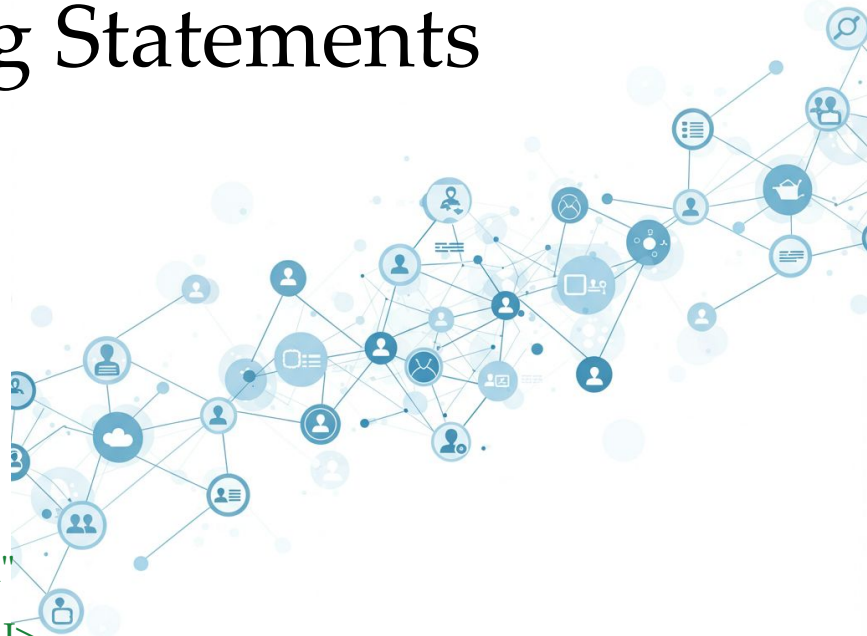
# Why Care About "Linked Data"?

- 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



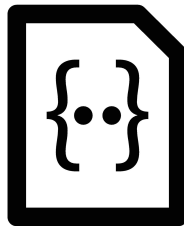
# Core Idea: RDF - Making Statements

- **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
}
```

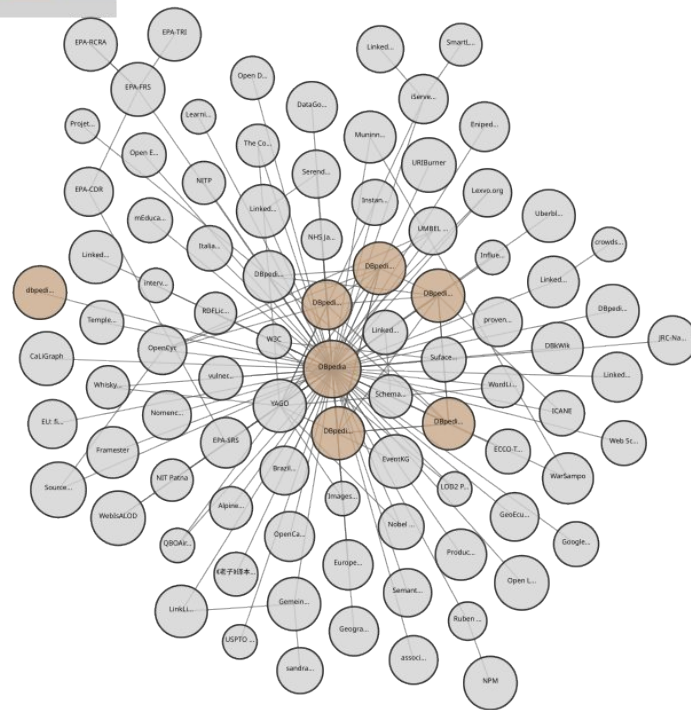
# Linked Open Data (LOD)

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

Legend

Wikipedia Related

Other



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.



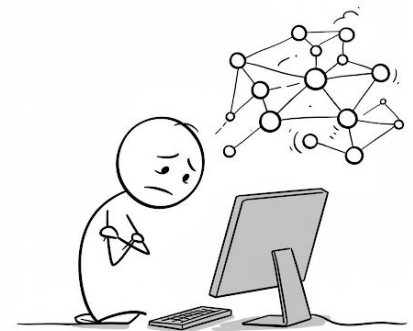
# Digital Humanities Key Aggregators/Hubs

- **Europeana:** European cultural heritage
- **Wikidata:** Collaborative knowledge base (like Wikipedia for data)
- **Pelagios Commons:** Linking historical places
- **Getty Vocabularies (AAT, TGN, ULAN):** 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 &gt; + 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

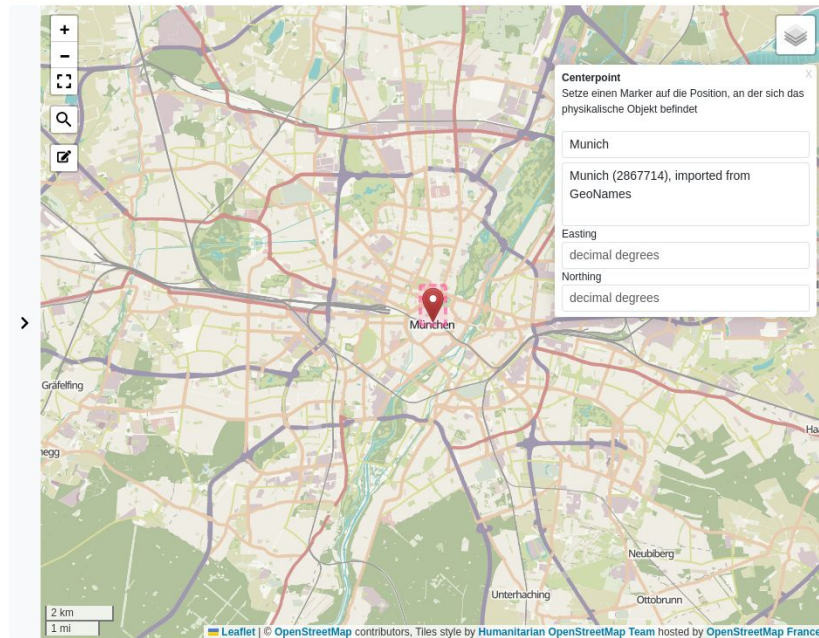
Beschreibung



Anlegen

Anlegen und weiter

Anlegen und weiter mit Feature



<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 Swagger UI for the OpenAtlas API. At the top, it says "Swagger" and "Supported by SMARTBEAR". The API is identified as "OpenAtlas API" with version "0.4.7e" and "OAS3". Below this, there's a description: "An API that allows user to access data from an OpenAtlas instance." There are links for "OpenAtlas - Website", "Send email to OpenAtlas", "GPL-2.0", and "OpenAtlas API Manual".

Under the "Servers" section, there's a dropdown menu showing "https://lmu.openatlas.eu/api/{basePath} - OpenAtlas Server". The "Computed URL" is "https://lmu.openatlas.eu/api/0.4".

Under the "Server variables" section, there's a dropdown menu for "basePath" with the value "0.4".

The "Entity Endpoint" section describes "Information about a single entity. The requested information is provided in Linked Places format, can be accessed." It shows a "GET" method for the endpoint "/entity/{entityId}".

The "Entity Query Endpoint" section describes "Combines several endpoints in one query." It shows a "GET" method for the endpoint "/query/".

The "Entities Endpoint" section describes "Information about multiple entities. The requested information is provided in Linked PLOUD format, can be accessed." It shows a "GET" method for the endpoint "/cidoc\_class/{cidoc\_class}".

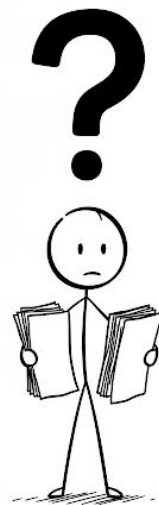


# Parameters: Customizing Your Request

- 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.

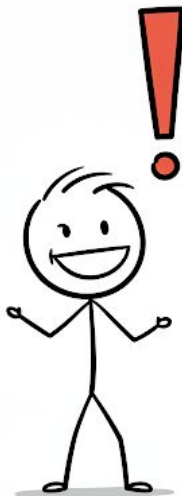
# Key Takeaways & Where to Explore

- **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

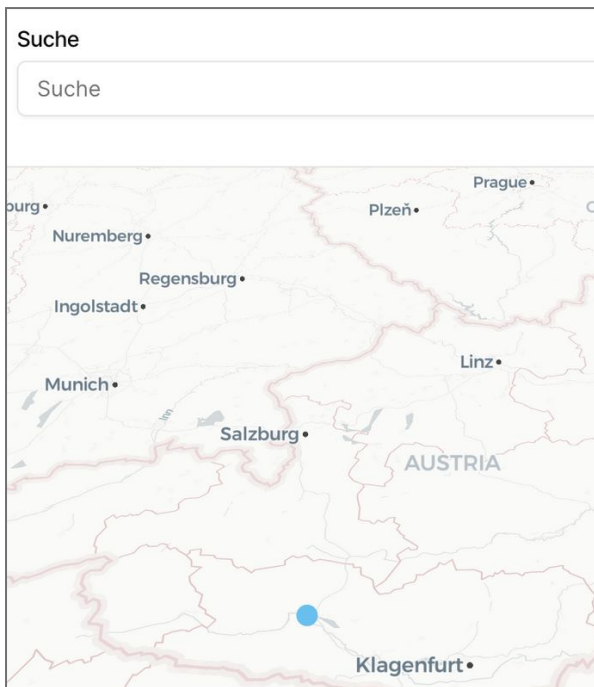
# OpenAtlas Discovery

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



### Stefan Eichert

Stefan is the 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)

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 ↕ ☰ ☷ +

COLORS

BRAND

 #b8cf5b

GEOJSON FEATURES


 #69c0ef

DEFAULT LOCALE

English ▼

LOGOS


LOGO (LIGHT MODE)



Choose different image
Replace with URL
Remove image

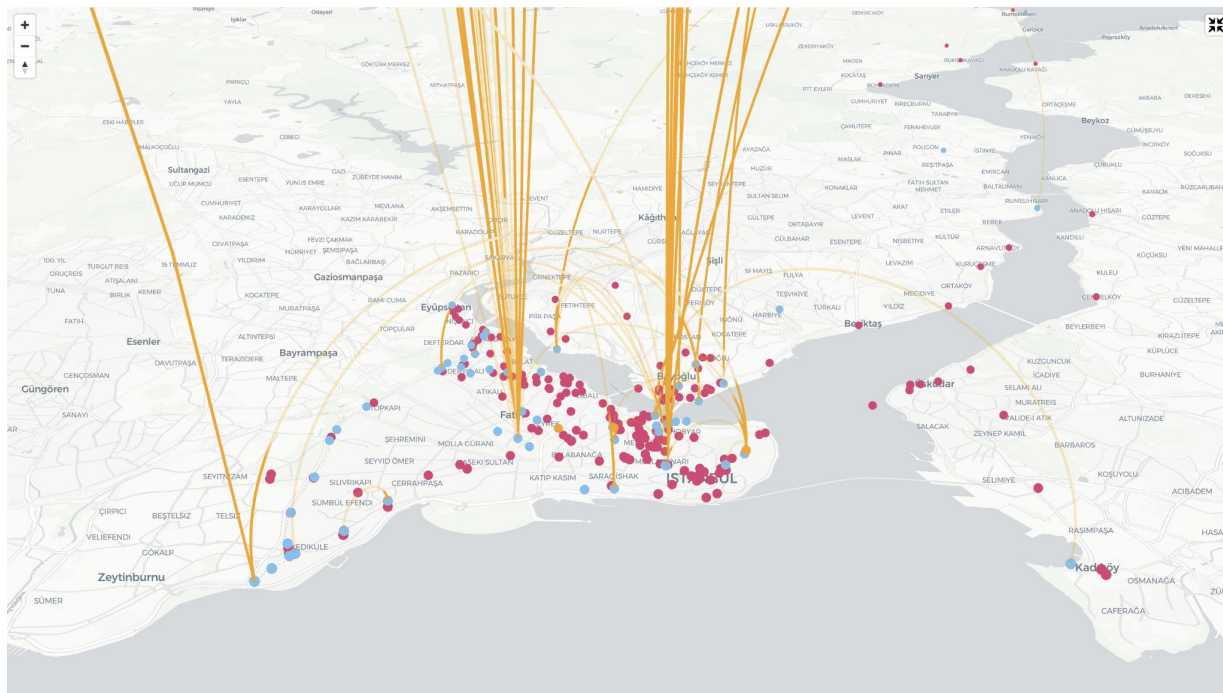
Logo in light mode

LOGO (DARK MODE)



# Current Development

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



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

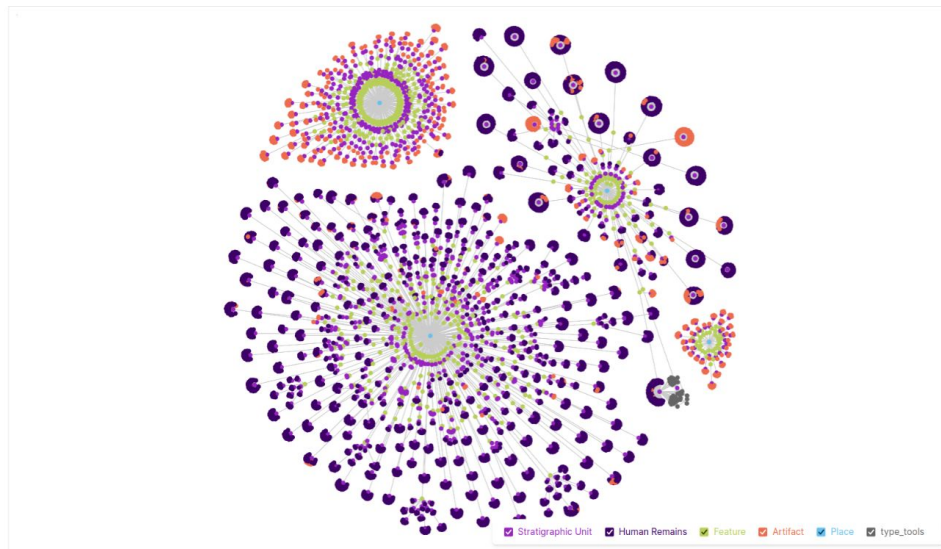


# Current Development

- ✓ CMS (Content-Management-System)
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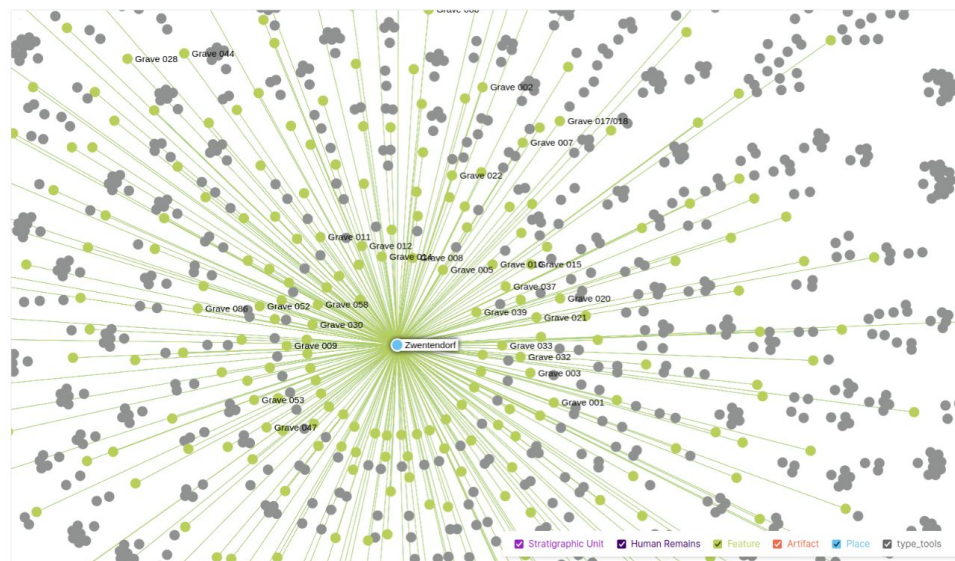
Search





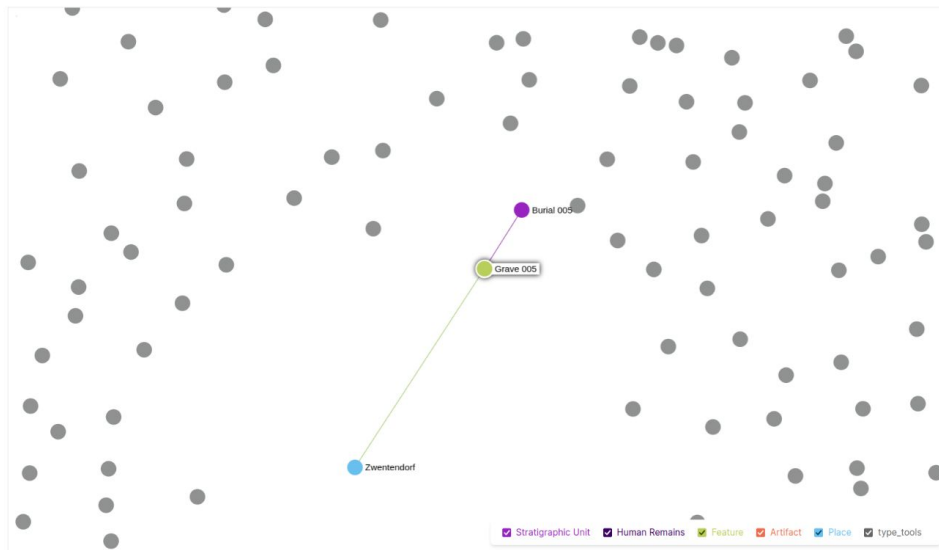
Search

zwentendorf

[Search](#)



Search

[Search](#)

# 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



&lt; Preceding: EventName

Superceding: EventName &gt;

**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

Person icon Title

Involvement

From - Till

**Details**TITLE  
Some PropertyBIBLIOGRAPHY  
Piccottini 1976STRATIGRAPHIC UNIT  
Burial 01/72

Feature

**Actor**

Alias 1, Alias 2, Alias 3

No known calendar dates

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Single Grave Height Length Width Stone Placement Flat Grave

**Important Places****Relations**

Person icon Title Residency

From - Till

Person icon Title Involvement

From - Till

Person icon Title Residency

From - Till

Person icon Title Involvement

From - Till

Person icon Title Residency

From - Till

Person icon Title Involvement

From - Till

**Title****Details**TITLE  
Some PropertyBIBLIOGRAPHY  
Piccottini 1976STRATIGRAPHIC UNIT  
Burial 01/72

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**

Person icon Title Residency

From - Till

Person icon Title Involvement

From - Till

Person icon Title Residency

From - Till

Person icon Title Involvement

From - Till

Person icon Title Residency

From - Till

Person icon Title Involvement

From - Till

**Members**

Person icon Title

Involvement

From - Till

Person icon Title

Involvement

From - Till

Person icon Title

Involvement

From - Till

# Live Demo

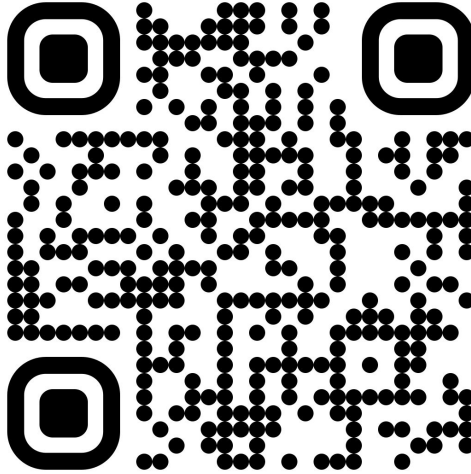
[Startseite](#)[Daten](#)[Karte](#)[Netzwerk](#)[Team](#)[Über das Projekt](#)[DE](#) | [EN](#)

## 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

