

# **Complexity Science \* Hub**

24-10-15

## **Crisis Knowledge Graph – Wissensbasis und Datenzugriff**

**Hannah Schuster**

**Amin Anjomshoaa**

**Axel Polleres**

**Johannes Wachs**

# Unser Wissensgraph in Zahlen

- **6.375.118 Tripel**  
Anzahl der Tripel, die aus verschiedenen offenen Datenquellen gesammelt wurden.
- **3.887 Ersthelfer**  
Organisationen, die im Krisenmanagement involviert sind, wie Feuerwehren und Polizeistationen.
- **249.781 Beobachtungen**  
Beobachtete Werte von Eigenschaften, die mit spezifischen interessierenden Merkmalen, wie Gemeinden oder Gitterzellen, verbunden sind.



# Wissensgraph – Aufbau im Überblick

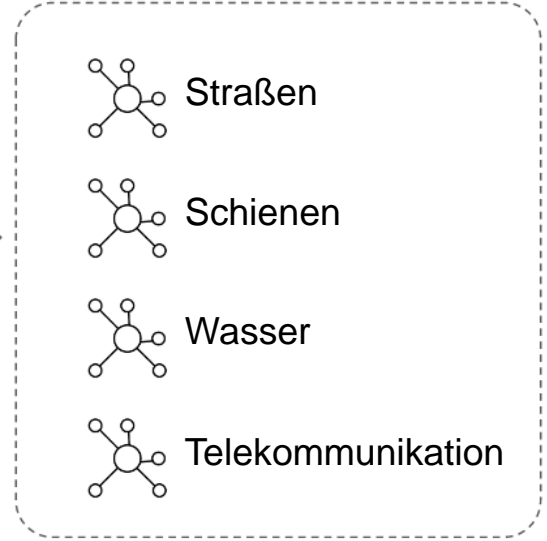
Mögliche Schocks und Belastungen



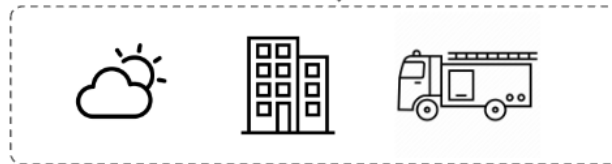
CRISP - Feld



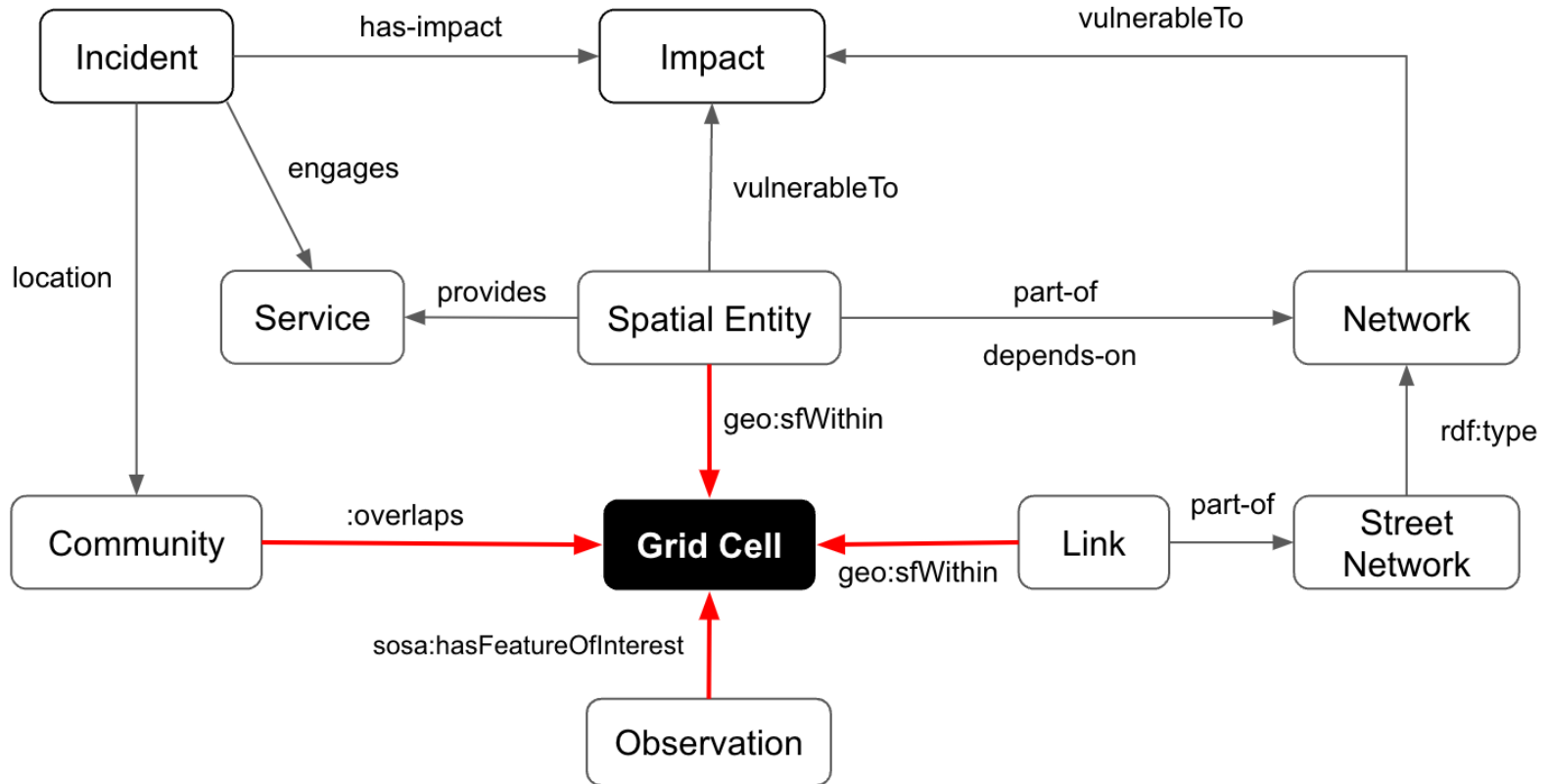
Infrastrukturnetze



**Felddaten** umfassen Wetter, Versorgungseinrichtungen, Bevölkerungsdaten, usw.



# Wissensgraph – Datenstruktur im Überblick



# Crisp - Feld

<http://crisp.ai.wu.ac.at/crisp/id/cell/L1.223.622>

<a href="#">hasGeometry</a>	<a href="#">asGeoJSON</a>	<a href="#">View data ...</a>
	<a href="#">type</a>	<a href="#">Polygon</a>

<a href="#">columnOrder</a>	622
<a href="#">rowOrder</a>	223
<a href="#">lat</a>	47.84113
<a href="#">long</a>	16.56749
<a href="#">eastConnections</a>	1
<a href="#">eastOrientation</a>	1496
<a href="#">northOrientation</a>	233
<a href="#">southOrientation</a>	233
<a href="#">westConnections</a>	1
<a href="#">westOrientation</a>	1496
<a href="#">type</a>	<a href="#">Feature</a>

- [GridRegion](#)
- [L1Cell](#)
- [Region](#)



# Krankenhausinformationen im Wissensgraph

## Krankenhaus der Barmherzigen Brüder Eisenstadt GmbH

<http://crisp.ai.wu.ac.at/crisp/id/hospital/K102>

<a href="#">equippedWith</a>	<a href="#">COR_Device</a>
	<a href="#">CT_Device</a>
	<a href="#">ECT_Device</a>
	<a href="#">MR_Device</a>
<a href="#">providesFor</a>	11
<a href="#">hasAddress</a>	<a href="#">country-name</a> Austria
	<a href="#">locality</a> Eisenstadt
	<a href="#">postal-code</a> 7000
	<a href="#">street-address</a> Johannes von Gott-Platz 1
<a href="#">hasTelephone</a>	<a href="#">hasValue</a> <a href="#">tel:+4326826011099</a>
	<a href="#">type</a> <a href="#">Fax</a>
	<a href="#">type</a> <a href="#">Work</a>
	<a href="#">hasValue</a> <a href="#">tel:+4326826010</a>
	<a href="#">type</a> <a href="#">Voice</a>
	<a href="#">type</a> <a href="#">Work</a>
<a href="#">hasUrl</a>	<a href="#">www.barmherzige-brueder.at</a>

<a href="#">type</a>	<a href="#">Hospital</a>
	<a href="#">IntensiveCareUnit</a>
	<a href="#">AcuteCare</a>
	<a href="#">AN_ICU</a>
	<a href="#">IM_ICU</a>
	<a href="#">KJU_ICU</a>
	<a href="#">Feature</a>
	<a href="#">Organization</a>
	<a href="#">HospitalCareSector</a>
	<a href="#">IntensiveCareUnit</a>
	<a href="#">Responder</a>
<a href="#">label</a>	Krankenhaus der Barmherzigen Brüder Eisenstadt GmbH



# Praxisbeispiel I: Abfrage im Wissensgraph

Query 3 × Query × Query 2 × +

```
http://crisp.ai.wu.ac.at/blazegraph/namespace/crisp/sparql  
1 # All features in a specific cell  
2 PREFIX crisp: <http://crisp.ai.wu.ac.at/crisp/>  
3 PREFIX geo: <http://www.opengis.net/ont/geosparql#>  
4  
5 SELECT * WHERE {  
6   ?feature geo:sfwithin <http://crisp.ai.wu.ac.at/crisp/id/cell/L1.210.382> .  
7 }
```

**Table** ☰ Response 8 results in 0.047 seconds

Simple view  Ellipse  Filter query results Page size: 50 ▾ ⬇ ?

- feature**
- 1 [crispid/link/14480871-2411861061](#)
  - 2 [crispid/link/14480871-2413855516](#)
  - 3 [crispid/link/7452582462-14480873](#)
  - 4 [crispid/link/7452582462-2411861061](#)
  - 5 [crispid/link/775312625-14480873](#)
  - 6 [crispid/link/775312625-2413855516](#)
  - 7 [crispid/pharmacy/1035](#)
  - 8 [crispid/police/949](#)

Showing 1 to 8 of 8 entries

< 1 >



# Praxisbeispiel II: Abfrage im Wissensgraph

Query 3 X Query X Query 2 X Query 1 X +

http://crisp.ai.wu.ac.at/blazegraph/namespace/crisp/sparql

```
1 # All communication towers in a community based on OSM
2 prefix crisp: <http://crisp.ai.wu.ac.at/crisp/>
3 prefix geo: <http://www.opengis.net/ont/geosparql#>
4
5 SELECT ?cell ?feature
6
7 WHERE {
8   <http://crisp.ai.wu.ac.at/crisp/id/community/21002> crisp:overlaps ?cell .
9   ?feature geo:sfwithin ?cell .
10  ?feature a crisp:CommunicationTower .
11  FILTER( STRSTARTS(str(?feature), str(crisp:)))
12 }
```

Table Response 5 results in 0.047 seconds Simple view Ellipse Filter query results Page size: 50

cell	feature
1 crispid/cell/L1.90.437	crispid/osm-node/4970916059
2 crispid/cell/L1.95.438	crispid/osm-node/5727719018
3 crispid/cell/L1.94.438	crispid/osm-node/6410352145
4 crispid/cell/L1.90.435	crispid/osm-node/6987836421
5 crispid/cell/L1.96.437	crispid/osm-node/8936773905

Showing 1 to 5 of 5 entries < 1 >





# Praxisbeispiel III: Abfrage im Wissensgraph

Query 3 ✕ Query 2 ✕ Query 1 ✕ +

⚙️

```
1 # All communication towers in a community based on OSM
2 prefix crisp: <http://crisp.ai.wu.ac.at/crisp/>
3 prefix geo: <http://www.opengis.net/ont/geosparql#>
4
5 SELECT ?cell ?feature
6
7 WHERE {
8   <http://crisp.ai.wu.ac.at/crisp/id/community/21002> crisp:overlaps ?cell .
9   ?feature geo:sfwithin ?cell .
10  ?feature a crisp:Hospital .
11  FILTER( STRSTARTS(str(?feature), str(crisp:)))
12 }
```

Press CTRL - <spacebar> to autocomplete

**Table** Response 2 results in 0.056 seconds Simple view  Ellipse  Filter query results Page size: 50

cell	feature
1 <a href="#">crispid/cell/L1.95.438</a>	<a href="#">crispid/hospital/K218</a>
2 <a href="#">crispid/cell/L1.95.438</a>	<a href="#">crispid/hospital/K238</a>

Showing 1 to 2 of 2 entries < 1 >





# Praxisbeispiel IV: Abfrage im Wissensgraph


Query 3  

<http://crisp.ai.wu.ac.at/blazegraph/namespace/crisp/sparql>

```
1 # Weekly heat days in a community
2 prefix sosa: <http://www.w3.org/ns/sosa/>
3 prefix crisp: <http://crisp.ai.wu.ac.at/crisp/>
4
5 SELECT ?obs ?heat_days
6
7 WHERE {
8   ?obs sosa:hasFeatureOfInterest <http://crisp.ai.wu.ac.at/crisp/id/community/21002> ;
9       sosa:observedProperty crisp:weeklyHeatdaysOver30;
10      sosa:hasSimpleResult ?heat_days .
11 } ORDER BY DESC(?heat_days)
12
```



 Table  Response 109 results in 0.214 seconds

Simple view  Ellipse   Page size: 50   

	obs	Feldkirchen in Kärnten	Jahr/Woche
1	crisp:id/community/21002/weeklyHeatdaysOver30/2013/30		
2	crisp:id/community/21002/weeklyHeatdaysOver30/2022/29		
3	crisp:id/community/21002/weeklyHeatdaysOver30/2012/27		
4	crisp:id/community/21002/weeklyHeatdaysOver30/2017/31		
5	crisp:id/community/21002/weeklyHeatdaysOver30/2018/31		

	heat_days
	-7^^ <http://www.w3.org/2001/XMLSchema#integer>
	-6^^ <http://www.w3.org/2001/XMLSchema#integer>
	-6^^ <http://www.w3.org/2001/XMLSchema#integer>
	-6^^ <http://www.w3.org/2001/XMLSchema#integer>
	-6^^ <http://www.w3.org/2001/XMLSchema#integer>



# Praxisbeispiel V: Abfrage im Wissensgraph

```
Query 3 x Query 2 x Query 1 x Query x +
http://crisp.ai.wu.ac.at/blazegraph/namespace/crisp/sparql
1 PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
2 PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
3 PREFIX geo: <http://www.opengis.net/ont/geosparql#>
4 PREFIX crisp: <http://crisp.ai.wu.ac.at/crisp/>
5
6 SELECT ?warn ?gemeinde ?warn_level ?warn_type WHERE {
7
8   ?warn a ?warn_type ;
9         crisp:impactedCommunity ?gemeinde .
10
11  ?warn_type rdfs:subClassOf crisp:WeatherWarning .
12
13  ?warn a ?warn_level .
14  ?warn_level rdfs:subClassOf crisp:WeatherWarningLevel .
15
16  # ?gemeinde geo:hasGeometry [geo:asGeoJSON ?geo] .
17  ?gemeinde a crisp:Community .
18
19  FILTER (?warn_level != crisp:WeatherWarningLevel)
20  FILTER (?warn_type != crisp:WeatherWarning)
21
22
23 } LIMIT 5
```

Table Response 5 results in 0.36 seconds Simple view Ellipse Filter query results Page size: 50

warn	gemeinde	warn_level	warn_type
1 crispid/warning/3959_6_1	crispid/community/30516	crisp:YellowWarning	crisp:SnowWarning
2 crispid/warning/3959_6_1	crispid/community/30524	crisp:YellowWarning	crisp:SnowWarning
3 crispid/warning/3959_6_1	crispid/community/30526	crisp:YellowWarning	crisp:SnowWarning
4 crispid/warning/3959_6_1	crispid/community/30543	crisp:YellowWarning	crisp:SnowWarning
5 crispid/warning/3959_6_1	crispid/community/31401	crisp:YellowWarning	crisp:SnowWarning

Showing 1 to 5 of 5 entries

< 1 >



# Krisen-Wissensgraph: Informationen auf einen Blick

## Incident

Provide incident's basic information.

Incident type

Community code

Potential Impacts

---

### Incident Impacts

Flood (2)

Basement Flooding (1)

Hail (1)

Fire (1)

Mudslides (1)

Road/Railway Closed (1)

River Lake Flooding (1)

Required Services

## Emergency Services

Commonly engaged emergency responders for selected impact(s)

Fire Department Service (5)

Rescue Service (2)

Infrastructure Restore Service (1)

Police Service (1)

Hospital Service (-)

L1.285.471 [48.43765 , 14.56269]

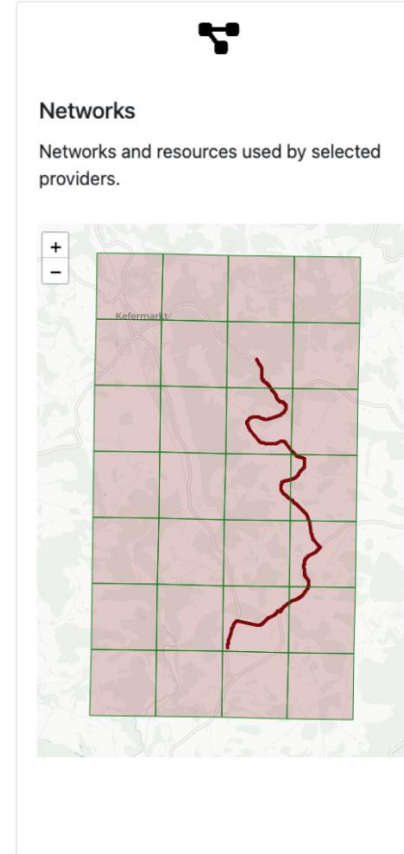
---

### Providers

Local providers for rendering selected services (10 km radius).

FireDepartmentService

- FF Selker-Neustadt
- FF Dingdorf
- FF Gutau
- FF Kefermarkt
- FF Lasberg



# Complexity Science \* Hub



<http://crisp.ai.wu.ac.at/>

[csh.ac.at](http://csh.ac.at)