



Aalto University
School of Science



UNIVERSITY OF HELSINKI



HELDIG
Helsinki Centre for Digital Humanities

Geocoding, Publishing, and Using Historical Places and Old Maps in Linked Data Applications

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Esko Ikkala, Jouni Tuominen and Eero Hyvönen
firstname.lastname@aalto.fi

The problem of place name ambiguity

- **Geographical information in web pages, databases and unstructured text is often expressed by means of place names**
- **Problems with place names**
 - one place → many different names
 - one name → many places
 - places change in time » E.g. regional and other changes of Helsinki
 - names change in time » E.g. place names of the Karelian region
- **Difficult or impossible to**
 - index document collections by location
 - perform geographic information retrieval accurately
- **Need unique identifiers for places**

Proof-of-concept: hipla.fi

Search and browse ~5 million places and 460 old maps.

The screenshot displays the hipla.fi web application interface. At the top left, the logo 'hipla.fi' is visible next to the text 'Finnish Ontology Service of Historical Places and Maps'. On the right side of the top bar, there are links for 'About' and 'Project home'. The main content area is divided into several sections:

- Select source dataset(s):** A list of datasets with checkboxes and icons: Finnish municipalities (1939-44), Karelian map names (1922-44), Finnish Geographic Names (contemp.), SAPO (1865-2010), Getty TGN, and Suggested places. A '+ Add a new place' button and a 'View all places on current map view' button are also present.
- Search places / Maps:** A search bar containing the text 'viip'. Below it, a list of results is shown, categorized by dataset:
 - Finnish municipalities (1939-44):** Viipuri, Viipurin lääni; Viipurin mlk, Viipurin lääni.
 - Karelian map names (1922-44):** Viipula (rakennettu kohde, Sortavalan mlk); Viipulanmäki (rakennettu kohde, Uukuniemi); Viipur-aho (rakennettu kohde, Räisälä); Viipuri (kirkonkylä, kaupunki, Viipurin mlk); Viipurinlammet (vesimuodostuma, Impilahti).
 - Finnish Geographic Names (contemp.):** Viipanalho (Talo, Lieto); Viipankorpi (Suo, Hämeenlinna); Viipanlahti (Vakaveden osa, Ruokolahhti).
- Map:** A satellite-style map of the Viipuri region in Finland. A red outline highlights the Viipuri area. A blue location pin is placed on the map, and a pop-up window is displayed over it.
- Pop-up window:** A white box with a close button (X) in the top right corner. It contains the following information:
 - Viipuri**
 - type: broader area
 - source: Finnish municipalities (1939-44)
 - A button: [View in linked data browser](#)
 - Related linked data from the WarSampo project:
 - [Events](#)
 - [Kansa taisteli articles](#)
 - [Photographs](#)

hipla.fi: replace place names with unique IDs

Autocomplete text search with multiple data sources:

Search places **Maps**

joensuu

Finnish municipalities (1939-44)
Joensuu, Kuopion lääni

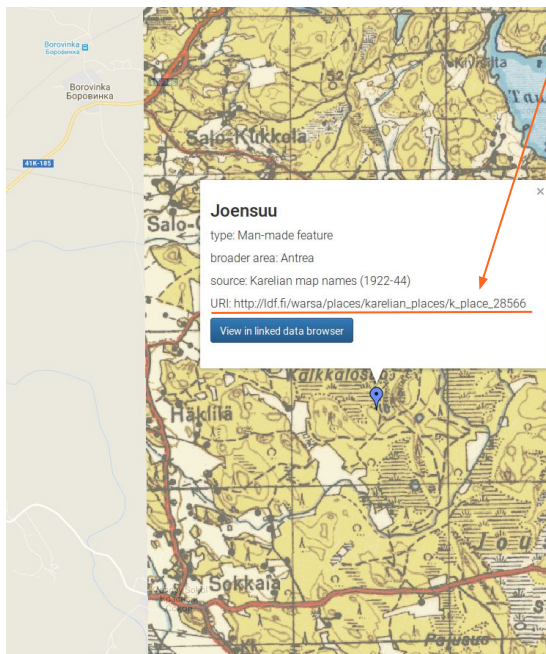
Karelian map names (1922-44)
Joensuu (Man-made feature, Kuolemajärvi)
Joensuu (Man-made feature, Rautu)
Joensuu (Man-made feature, Valkjärvi)
Joensuu (Man-made feature)
Joensuu (Man-made feature, Antrea)

Finnish Geographic Names (contemp.)
Joensuu (Talo, Salo)
Joensuu (Talo, Sipoo)
Joensuu (Talo, Salo)
Joensuu (Vakaveden osa, Salo)
Joensuu (Talo, Salo)

Finnish Spatio-Temporal Ontology (SAPO)
Joensuu(1848-1921) [coordinates missing]
Joensuu(1922-1953)
Joensuu(1954-2004)
Joensuu(2005-2008)
Joensuu(2009-)

Getty TGN
Joensuu (inhabited places, Pohjois-Karjala, Suomi, ... World)

Disambiguate search results on modern and historical maps:



Suggest missing places:

Place name

Alternative name

Description

Municipality

Broader area

Place type

Comment

Suggestor

Coordinates (click on the map)

Target dataset

Indexing with missing and ambiguous places

+ Add a new place

View all places on current map view

Search places **Maps**

pyhäjärvi

Finnish Spatio-Temporal Ontology (SAPO)

- Pyhäjärvi OI.(1866-1968)
- Pyhäjärvi UI.(1868-1931)
- Pyhäjärvi UI.(1932-1968)
- Pyhäjärvi Vpl.(1871-1939)
- Pyhäjärvi(1969-1992)
- Pyhäjärvi_2(1996-)

Getty TGN

- Pyhäjärvi (lakes (bodies of water), Pohjois-Pohjanmaa, Suomi, ... World)

Utilizing historical maps

- Historical place names can often be seen only in historical maps
→ hipla.fi is integrated with an open source map aligning tool: Map Warper

The screenshot displays the Map Warper web application interface. On the left, a sidebar contains several navigation elements: a blue button with a plus sign and the text '+ Add a new place', another blue button with the text 'View all places on current map view', a search bar with the text 'Search places' and a dropdown menu showing 'Maps', a blue button with a refresh icon and the text 'Refresh map list', and a dropdown menu with the text 'All map series'. Below these is a list of selected maps, with the first entry 'Sortavala' checked. This entry includes a small thumbnail of the historical map, the text 'Karelian maps', the scale '1:100 000', the description 'topographic map', and a blue link 'View in Map Warper'. The main area of the interface shows a map of the Sortavala region in Karelia, Finland. The historical map is overlaid on a modern Google Maps background. The historical map is rendered in a yellowish-tan color scheme with contour lines and various place names in Cyrillic and Latin script. Several blue location pins are placed on the historical map, corresponding to specific locations. A red dashed border highlights the area of the historical map that is currently visible. The Google logo is visible in the bottom left corner of the map area, and the text 'Map data' is visible in the bottom right corner.

+ Add a new place

View all places on current map view

Search places **Maps**

Use the checkboxes to select maps that intersect the current map view. The opacity of the historical map can be controlled with the slider on the top right corner of the screen.

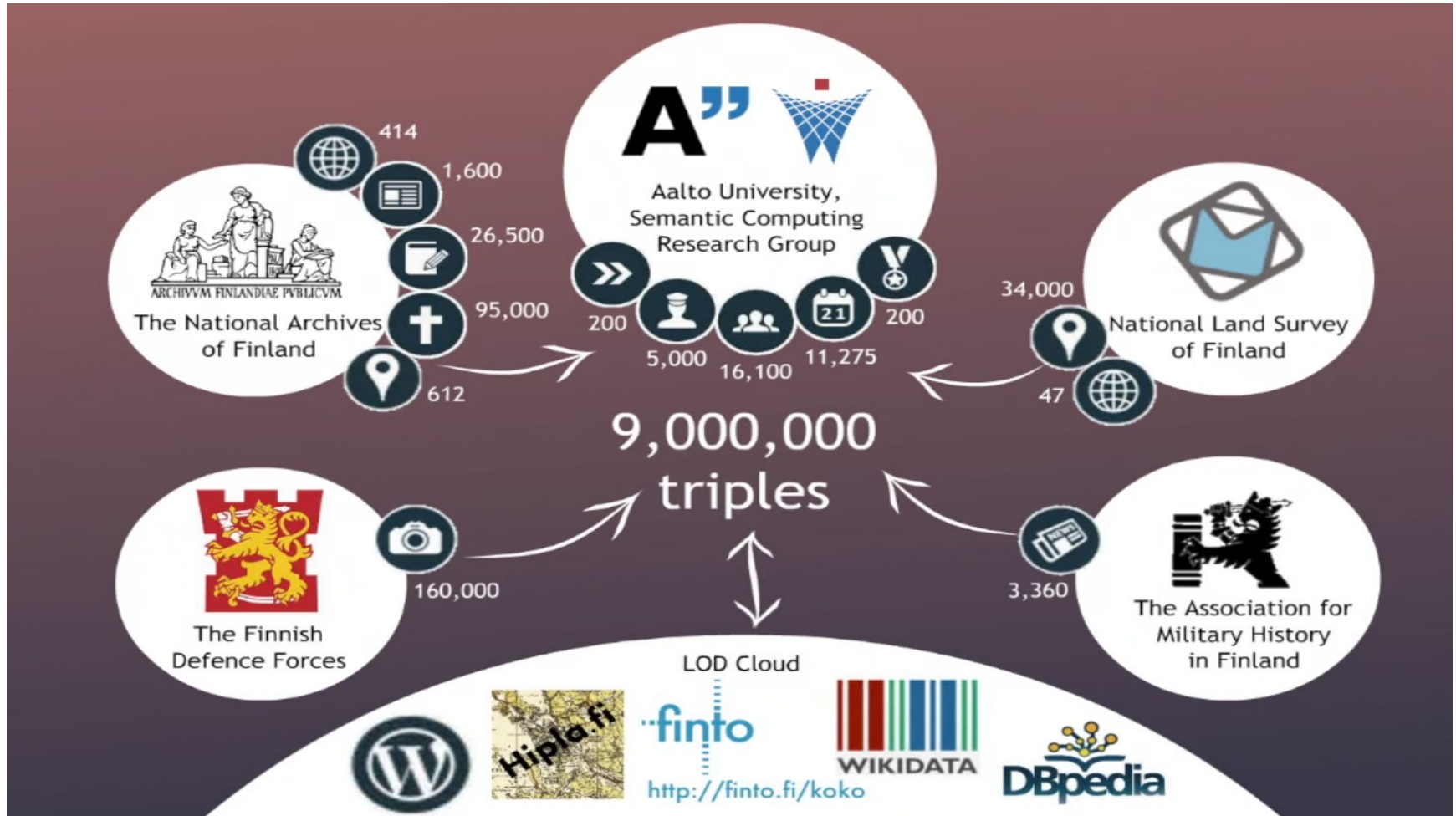
Refresh map list

All map series ▾

- Sortavala**
Karelian maps
1:100 000
topographic map
[View in Map Warper](#)

Map data

WarSampo: Finnish World War 2 as Linked Open Data



hipla.fi place ID

Automatic & manual linking

WarSampo sources

Finnish WW2 place ontology compiled from:

- National Archives of Finland's data of 612 wartime municipalities
- Finnish Spatio-Temporal Ontology describing the regions of the Finnish municipalities in different times
- Dataset of geocoded Karelian region map names (35,000 map names with coordinates and place types)
- Current Finnish Geographic Names Registry (PNR) (800,000 places).

93 000 links

160 000 photographs

181 000 links

426 000 wartime events (battles, troop movements, deaths, etc.)

3000 links

3400 magazine articles

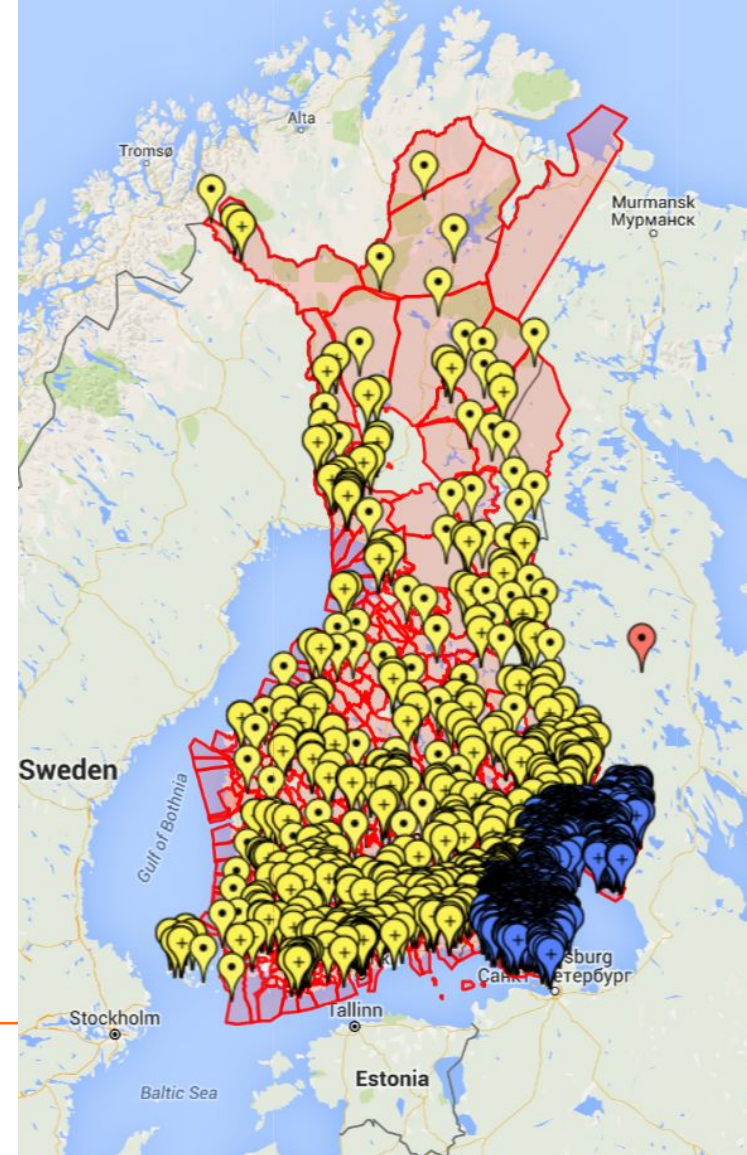
WarSampo

Map based perspective to WW2 data

- 2400 places
- 280 000 links to contextual information related to places (photographs, events, articles, etc.)

WarSampo portal (sotasampo.fi/en)

- 8 interlinked perspectives to WW2 data
- 130 000 visitors in 2017
- Users came across errors in automatically created links and sent corrections, which were verified and added to the data



Thank you!

More information:

- **Proof of concept online:**
 - hipla.fi
- **Search widget for developers:**
 - <https://github.com/SemanticComputing/federated-sparql-search-widget>
- **Open source map georectifier:**
 - <http://mapwarper.onki.fi/>
- **Project and publications:**
 - <http://seco.cs.aalto.fi/projects/histoplaces/en/>