

MAPPING LITERATURE: THE PROTOTYPE OF “A LITERARY ATLAS OF EUROPE”

Anne-Kathrin Reuschel
reuschel@karto.baug.ethz.ch

Barbara Piatti
piatti@karto.baug.ethz.ch

Lorenz HURNI
hurni@karto.baug.ethz.ch

Institute of Cartography, ETH Zurich
8093 Zurich, Switzerland

Abstract

Mapping Literature and analysing maps of literary landscapes are the ambitious aims of the project “A Literary Atlas of Europe”. By means of cartographic knowledge and techniques, instruments are provided to investigate various spatial aspects in the field of literary geography. Literary spaces are working different compared to other spatial themes – all spatial objects are described by words – and require new data models and visualisation methods. This paper will present the required complex text analysis, the actual data acquisition and the automated visualisation of certain spatial literature entities. Based on three model regions the feasibility and transferability of the presented methods are determined.

1. Introduction

Cartographers and literary scientists have joined forces in an interdisciplinary project to create a prototype of “A Literary Atlas of Europe”. This project accepts the challenge to map literature combining cartographic methods with literary aspects and topics. The implementation of the prototype is currently being realised at the Institute of Cartography, ETH Zurich. Three opposed test regions were chosen to develop the methodology of mapping literature: a mountainous area (Lake Lucerne in Switzerland), a coastal area (North Frisia in Germany), and a city (Prague, the capital of the Czech Republic). Those model regions are densely settled by literary settings and show contrasting landscapes that demonstrate the transferability of the method. One has to take into account, that the geography of literature works in a significantly different way than other spatial topics that are represented in cartographic products. Fictional spaces are artificially created by description in prose by the author. They do not have definite borders, are often hard to localize and shift on a scale between strong and weak relation to the actual geospace, ranging from realistically delineated to completely imaginary spaces (Piatti 2008). The literary world is described only in words, not measurable and

never demanded to be complete. Creating maps based on the elements the author used to build up his fiction, will not only better show where fiction takes place, however, it will also demonstrate new correlations between these two worlds.

2. Methodology

The prototype of “A Literary Atlas of Europe” is realised by the following centralized working steps that will be discussed in detail, in the next paragraph. First, the fiction has to be analysed based on the developed theory of literary geography (2.1 From fiction to a map). Secondly, the data are entered into a complex web form and organised in a spatial database (2.2 Data acquisition). Thirdly, the data are prepared and validated for the specially developed visualisation system (2.3 Data visualisation). The result, the “Literary Atlas of Europe” will serve as a tool for interpretation and starting point for new research questions used by scholars, for educational purposes and interested people.

2.1 From fiction to a map

To map a fictional world, the spatial structure of the prose has to be broken down into single elements and their respective functions. According to the newly developed system, (see Piatti 2008, Piatti et al. 2009) the geography of literature is composed of five main categories:

| Entity | Description |
|------------------------|--|
| setting | where the action takes place |
| zone of action | where several settings combined |
| projected space | where characters are not present, but either dream of it, remember it, or long for this space |
| route | along which characters move |
| marker | a mentioned place in the story, but not part of the categories above; markers indicate the geographical range and horizon of a fictional space |

Table 1: Entities that compose the geography of fiction

Every topographic or geographic mention within the story belongs to one of these categories. The texts are continuously analysed by the scholars, which are experts in history and development of the model region they are working on. Having a good general knowledge about the region is essential to identify settings that have vanished, been invented or transcribed. In addition to the collected geographical locations of the elements, attributes and criteria are also added to each object. By doing so, the scientific analyses in literary geography can be achieved.

The analysis of the most important spatial literary element “**setting**” is presented below. It serves as a demonstration of how complex the established attribute system is and illustrates the possibilities of combining the collected data subsequently.

A **setting** is a location where the action takes place and can exist as a point (buildings, squares), a line (sections of roads, sections of rivers) or a polygon (suburbs, region) depending on the extent of the described area compared to the scale of the model region map. The name of the **setting** found in the text, will later be used as label on the map and differentiated as either a name that is currently used, or a historical one or a foreign-language one. Furthermore, a difference between the names that have by now disappeared, or were purposely camouflaged by the author, or just invented by the author will also be shown. It is mandatory to determine the identity of the setting: textimmanent names (*direct referencing*) or names deduced indirectly from other sources or researches (*indirect referencing*). For example in Thomas Mann’s famous novel "Buddenbrooks" (1901), Lübeck as the main setting is never named. Yet through a couple of hints (Travemünde and the Baltic Sea are mentioned), it becomes evident, that no other town can be filled in. At the same time the level of accuracy has to be estimated. Given that the spatial elements we are dealing with are described in words and are not easily measurable, there is no numerical indication of uncertainty. Instead, the scholars indicate a vague area where the action could take place (*zonal location*) or a quite precisely delimited location (*precise location*). The relationship between spatial objects from literary texts and their corresponding geospace needs to be specified for each single element and divided into three categories, i.e. imported, transformed and invented (see Piatti, 2008). Furthermore a set of attributes that characterise a **setting** needs to be captured:

Is the location used for the **setting** replaceable (*simple scenery*)? Or is the scenery important to the story (*thematic scenery*)? Does the setting have a *mythical* or *symbolical connotation*? Is the setting acting itself physically (*protagonistical-physical*) or does it affect the figure’s psyche (*protagonistical-psychic*)? In addition to those general properties, settings are tested for some more specific attributes that are objects of investigation for each model region. For instance, some **setting** in Prague are linked to the “Kafka” figure or the Golem creature. Similarly, “Theodor Storm” figure and “Wilhelm Tell” figure are analysed for North Frisia and Lace Lucerne respectively.

A particular feature that is used with settings involves the possibility of transforming a given topology of reality either by shifting places (*shifted setting*) or by combining real places or even towns to a new fictional location (*synthesised setting*). To record these features, more than one geometry object is required.

2.2 Data acquisition

An intuitive online entry system allows scholars to input the extracted and analysed text data. This form allows entering in all general information about the author and text, as

well as more detailed data for every single **setting** or **projected space** including attributes and criteria involved. With the help of googlemaps-api (link: Google) a digitalisation tool is provided for capturing places or regions the fiction is set in. The digitised objects are prepared as simple features, using an OGC standardised geometry model (link: OGC). The geometries of the fictional elements are therefore defined as:

| Entity | Geometry | Remark |
|--------------------------------------|----------------------|---|
| setting | point, line, polygon | if displaced or synthesised: more than one geometry |
| projected space | point, line, polygon | |
| route (compound of waypoints) | line | two options: schematic or interpreted |
| waypoints of routes | point | |
| marker | point | |

Table 2: Possible geometries of fictional elements

The core of the atlas is a spatial database that organises the entered spatial elements with about 50 attributes and criteria into all main categories of geography of literature for analysis. Advantages of using a spatial relational database to automatically generate maps are obvious:

- literary spatial data and attributes are captured in a coherent structure and comparable fashion, making them ready for an automated processing
- possibility of generating different map products and illustrations
- querying and data filtering facilities to access map products for specific themes
- automation of symbolisation and map generation
- fusion of a huge amount of data
- supported GIS functionality allows spatial analyses

Based on the main tables containing general information about the text and the author, each spatial, literary element (namely settings, projected spaces, markers, routes) is organised in an own relation and related to the main tables (figure 1).

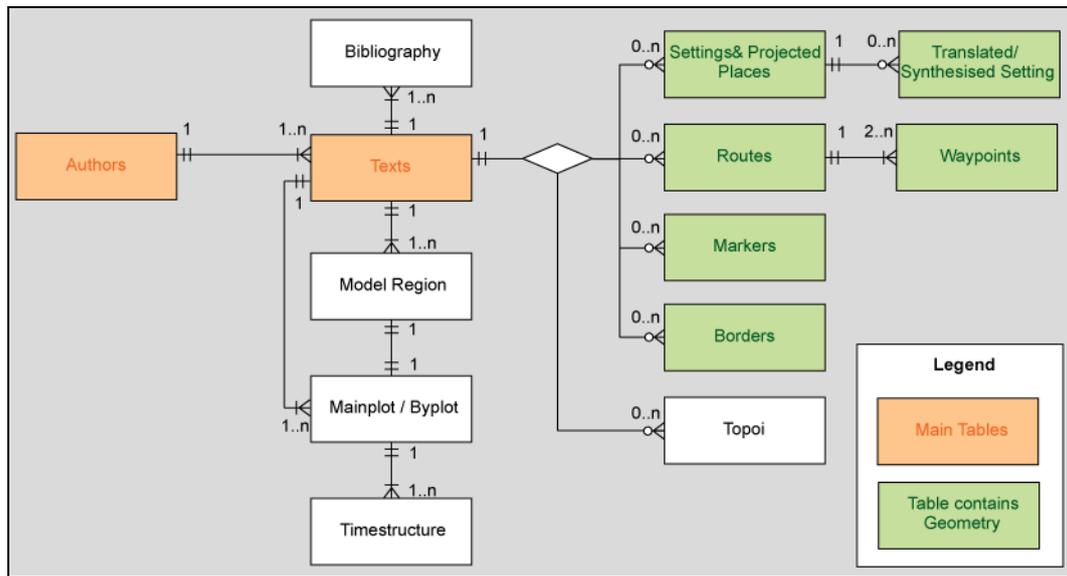


Figure 1: ER – Diagram (Crow's Foot notation) of the database and its containing tables (extent)

2.3 Data visualisation / Data output

Working with maps and even providing maps is reasonably common among literary authors and scholars. According to Piatti (2008), not the scholars or hermeneutics started to create maps for fictional spaces, but the authors or publishers themselves. Those maps could be anything, from small sketches to complex general maps.

The “Literary Atlas of Europe“ project goes one step further. The intended maps do not serve as mere illustrations, but also as tools for interpretation and powerful analytical instruments. Correlations or patterns between spaces, time, authors, stories, history in general and developments within the model regions become visible.

The data output and mapping solutions must fulfil several criteria:

- they have to pay respect to the genuine rules of literary settings (e.g. uncertain localisation, transformed reality)
- maps must be simple and intuitive
- additional information must be retrievable (e.g. how is a setting transformed or how did the scholar identify a place, if it is not directly mentioned in the text)
- maps have to be appropriate for a quantitative analysis

Two approaches based on the same data (and database respectively) need to be developed and are described in more detail below. The first approach focuses on portraying an individual text (the geography of a single fiction) including all discrete spatial elements (see table 1) with their respective functions. Based on three chosen model regions, these maps do not only display the quantity and currency of

geographical elements, but also differentiate between the function of the spatial elements (setting, projected places, routes, markers) and the relation between fiction and reality. Comparing maps from individual texts within a model region is primarily of interest to the scholars. The second approach facilitates visual analytics of a huge amount of texts obtained from thematic queries of the database using statistical methods. The resulting statistical maps display agglomerations and blank areas (“gravity centres“ vs. “unwritten regions“). Depending on the data combinations and type of queries, patterns of a literary landscape emerge. The possibilities of combining all sorts of attributes allow new insights in the research area of literary geography and will play a crucial role in establishing this field of study.

Both approaches will be realised using the same base maps. Detailed analyses of how to represent the literary landscape best provided the following results: First, there will be no additional labels on the map than those coming from the narrative itself. In doing so, the maps do not intend to represent both worlds, the fictional and the real one. The geography of the story cannot naturally be filled with our well-known reality. Second, the current data is utilised to display the recorded fictions, although the text can also be written (year of publication) or set in another time (time of plotline). According to Döring (2009) conflicts in relating (historical) text data to a geographical map of a particular time are not avoidable and not solvable without making compromises. This might be one reason why Moretti (1998) decided to use empty maps in his atlas of the european novels, where one can only find the coastline and the border of countries. In the course of our research, we found out that instead of allocating texts to one specific time, a limited number of additional historical maps that can be provided next to the contemporary map, is the most suitable compromise for the scholars. The third property of the base map is a gentle use of colours, so the emphasis will be on the topic.

The resulting map products and flexibility of the data and database serve as a starting point for undertaking further interpretations and gaining insights within the field of literary geography. In the following, this paper is focusing on the first approach, the second one is not part of this paper.

Visualisation of Spatial Literary Elements

The geography of fiction works in a significantly different way compared to other spatial topics that are represented in cartographic products. Piatti, et al. (2009) discuss these properties and point out that: **settings** vary in their relationship between geospace and textual space; settings do not have definite borders; and settings can be located ‘somewhere’, in a quite uncertain location.

Consequently, the geography of fiction must be characterised as a rather uncertain or imprecise geography. At the Encyclopedia of GIS Goodchild (2008:480) defined spatial uncertainty as “the difference between the contents of a spatial database and the corresponding phenomena in the real world. [...] Many spatial databases are based on

definitions of terms, classes, and values that are vague, such that two observers may interpret them in different ways.“ During the last several years the necessity of visualising uncertainty, and for this reason finding new visualisation methods, was discussed and documented in the literature by many authors (MacEachren 2005, Pang 1997, Drecki 2002). Graphic methods that are frequently suggested to represent uncertainty include: transparency, crispness of symbol edge, saturation (MacEachren 2005), squares, opacity, color saturation, blinking methods, 3D reliability surface (Drecki 2002), uncertainty glyphs, animation or sonification (Pang, 1997).

Based on these studies an appropriate symbolisation for literary cartography (definition cf. Piatti et al. 2009b) inside of the field of literary geography needs to be established. Described below are the problems, characteristics and the suggested visualisations of the defined spatial literary elements.

Settings and Projected Places:

Despite the fact that **setting** and **projected places** are two different categories of the literary geography, they both display similar type of behaviour. Both can be coded as a point, a line or a polygon. Accuracy of location can be expressed as either zonal or precise. Furthermore, the relationship between geospace and textual space is specified as imported, transformed and invented. There is also additional information about the kind of topographical entity (see 2.1 From fiction to a map). To differentiate between **settings** and the **projected places**, a colour system was developed (see figure 2).

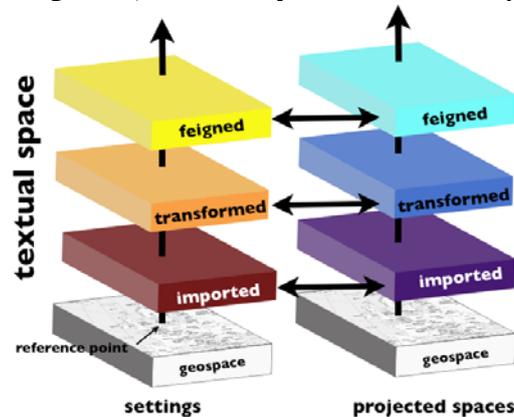


Figure 2: Colour coding system

A set of cold colours, ranging from violet to cyan, was used to map ‘projected places’ and a warm set of colours, ranging from red to yellow, to map ‘settings’. The colour system supports a visual effect of colour fading with the transformation degree of the described places on the one hand (y-direction), and an intuitive explicit visual comparison between both colour sets, on the other (x-direction).

To represent uncertainty, or vague and indefinite attitude/behaviour, all objects that are indicated as a ‘zone’ and have an area or line geometry are shown by a colour fading effect that continuously reduces the opacity from the centre to the peripheral. An object defined by a point (e.g. a house or a village) that can only be located inside a region will be animated by using a slow appearing and disappearing of a labelled point symbol (see Piatti et al. 2009 for a more detailed description of creating *fuzzy shapes* and *animations*). This animation illustrates a setting or projected place that has just a small size compared to the fuzzy shape symbolized areas, but the region within it can be located might be of arbitrary size. The different usages of toponyms that can occur as mentioned in chapter one is shown by applying different label techniques. An outline of how this will be realised can be found in table 3:

| Font code for settings & projected spaces; | |
|--|-------------------------|
| Examples: | Font code: |
| Prag | current name |
| <i>Unterwalden</i> | <i>historical name</i> |
| Nidwalden | current name |
| Prague | foreign-language |
| Prag | current name |
| (Rungholt) | (disappeared) |
| SELDWYLA | INVENTED NAME |
| Perle | renamed/camouflaged |
| Prag | current name |
| The Town | transcribed/nameless |

Table 3: Font code for settings and projected spaces

The following map examples (figure 3a and b) include the defined implementation of **settings** and **projected spaces**. Regarding these maps, one can immediately see that the most remarkable fact is the difference of spatial object density. Obviously, mainly the denser “spatialised” fictions will cause huge visualisation challenges. The overlapping of spatial objects and labels has to be taken into account. Interactive solutions, generalisation, scale adjustment and an automated label placement need to be developed. Furthermore, concentrations on developing a visual solution for “*function changes*” (e.g. a former **setting** can develop into a **projected space**) need to be studied.



Figure 3: Map extent of Prague (left: Alois Jirašek: “Mezi Proudý (I)”) and North Frisia (right: Detlev von Liliencron: “Auf der Austernfischerjagd”) with different density of literary elements

Routes:

One of the most challenging category of the literary geography are the **routes** characters are following. No other spatial element is more patchy and uncertain. One can think of characters show up “out of nowhere” or a path trails off into indistinction. Often more than one possibility exists to move from place A to place B. To slowly approach the problem, every waypoint that compose a route has to be indicated as either *textimmanent*-approach (directly taken from the text), *plausible* (every other possibility can be excluded) or *interpreted*-approach (the most probable possibility according to the scholar). Having these information two different routes can be derived: an interpreted one, containing all entered waypoints, and a schematised one, containing only waypoints directly taken from the text. Furthermore, “textimmanent” waypoints can directly be labelled using the place name from the fiction.



Figure 4: Map example with interpreted routes, differentiated between “textimmanent”, “plausible” and “interpreted” waypoints (unlabeled)

Figure 4 shows a map example with interpreted routes. To visually distinguish between these three types of waypoints, different point symbols are used. The idea is not to configure a route, which is absolutely precise, but to give one interpretation of where the characters could move along. This has to be done in a very sensitive way, by paying respect to the logic of the presented fictional space.

Marker:

The category **Marker** is the only category without a special literary function. Markers are mentioned places in the story and stake out the spatial limitations of a fictional space. In the database these nominations are recorded with a point geometry, whether it indicates a town, country or even a continent. Within the map one can find a discreetly highlighted name without a symbol. But even without a deeper function the marker category deserves closer attention. One can see the spreading and the number of elements and can make first statements about a wide geographical diversity or the geographical focussing on a small area (see figure 5).



Figure 5: Map examples with different appearances of markers: (left: Alois Jirašek: “Das Dunkel”), (right: Alois Jirašek: “Rabbi Löw und sein Golem”)

2.4 Outlook

So far, first results to visualise the literary elements **settings**, **projected places**, **marker** and **routes** could be presented. Nevertheless, to show all attributes of the certain objects in its entirety, more research in developing a so-called “second information layer” has to be undertaken. Those information should be retrievable by interaction (*mouse events*) on the objects itself or with the help of choosing individual thematic layers.

The next big step forward will be the implementation of the second approach, using statistical methods for analysing a huge amount of literary elements from different texts,

obtained from thematic queries to the database. One can finally analyse the literary landscape of the model regions as a whole with the help of this technique.

3. Conclusion

First attempts show that a cartographic representation of literary settings is feasible. The project “A Literary Atlas of Europe” offers a possibility to conduct research in the field of literary geography. Therefore a system was developed to collect and analyse fictional data and present it on maps subsequently. To meet the requirements to respect the genuine rules of a fictional space, symbolisations in the field of “uncertainty” are necessary. Both, the cartographic and the literary research have to compromise and balance between uncertainty and interpretation. Many aspects remain to be researched, for example solutions to map synthesised and translated settings or solutions to visualise function changes. Some aspects of literary geography remain unmappable, for example completely imaginary spaces or different variations of a geospace within one fiction. Nevertheless, cartographic methods seem to be a promising way to communicate this information and to support the research in the field of literary geography.

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