

Reconstructing Ethnic Maps of the Carpathian Basin for Interactive Use

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Abstract:

Presenting antique items, especially large paper based maps, to the general public on a large scale is fraught with compromises – the item should be accessible but at the same time, due to its rarity, must be preserved and possible damage minimised. In this day and age a good compromise is to digitise the map and publish it on the internet giving access to a possible audience that is far greater than that of any museum or library. Digitising – scanning – of maps for the purposes of preservation has been ongoing for some time already. In most cases the original scanned map appears in a digital form as a large resolution image. Examples being are Mapire by Arcanum¹ and the digital map collection of the Institute of Cartography and Geoinformatics at the Eötvös Loránd University (Elek: 2006 279). In both examples the interaction with the user is limited to zooming and panning. However Modern online GIS applications offer numerous ways to interact with the user (e.g. using custom layer sets) and thus provide heretofore unknown insights. Most of these features have, up until now, only been applied and used on current maps showing contemporary information.

During and after the First World War many ethnic maps were made depicting the Carpathian Basin to be used by the decision makers to demarcate the new borders in Central Europe. Many of these show differing ethnic structures of the same area (Jeney: 2020 196) each claiming correctness and authenticity. Despite being wildly different most of them claim to be based on the same census data. Modern day GIS features are needed to compare their thematic contents accurately to which end a custom GIS application was developed by the author to compare the picture individual maps show of the ethnic structure of the depicted area. Using this GIS system, the individual thematic categories, in this case a distribution of the different ethnic groups in the population, can be compared. This system was used by the author to make comparative studies of the maps in order to show how the different mapping methods could have influenced the picture the map reader got of the ethnic structure of the depicted area. American geographer Lawrence Martin wrote that the Hungarian maps were the most precise of any government (Martin: 1923 xi), which has been demonstrated to be true by this new system..

Vectorised reconstructions of georeferenced old ethnic maps were created and published online². The geometry of the reconstructed maps is identical to the original. In the GIS database each ethnic group on a map is a separate layer. All layers from a particular map are grouped, so one can see which layer is from which map. The individual layers can be switched on and off, and their colour and opacity can be altered. One can view multiple maps or parts of them on top of each other, such that only certain ethnic groups are visible. Since the maps are georeferenced and their projections have been converted to be identical, one can easily compare which areas are shown to be inhabited by a certain ethnic group on a certain map. Since the opacity of the layers can be altered, it is very easy to compare the contents of various maps. If one only wants to compare one ethnic group, one can show only this group on the maps concerned (Figure 1). If the colour of two layers to be compared are similar one or both colours may be changed to highlight the similarity or difference between the two maps. The author has also included an *OpenStreetMap* layer to allow the viewer to orient themselves based on known boundaries and other features (roads, cities, etc.)

¹ <https://maps.arcanum.com/hu/>

² <https://trinaon.terkep.mki.gov.hu/>

Since one map shows uninhabited areas, the GIS system has a feature to show georeferenced photographs, in order to enable the user to get a better grasp on what the given area looks like. This can help the user decide if the area was in fact inhabited or not. Many maps show these uninhabited areas as habited. This completely changes the picture conveyed to the map reader. By being able to take a look at the area one can decide which map is more accurate.

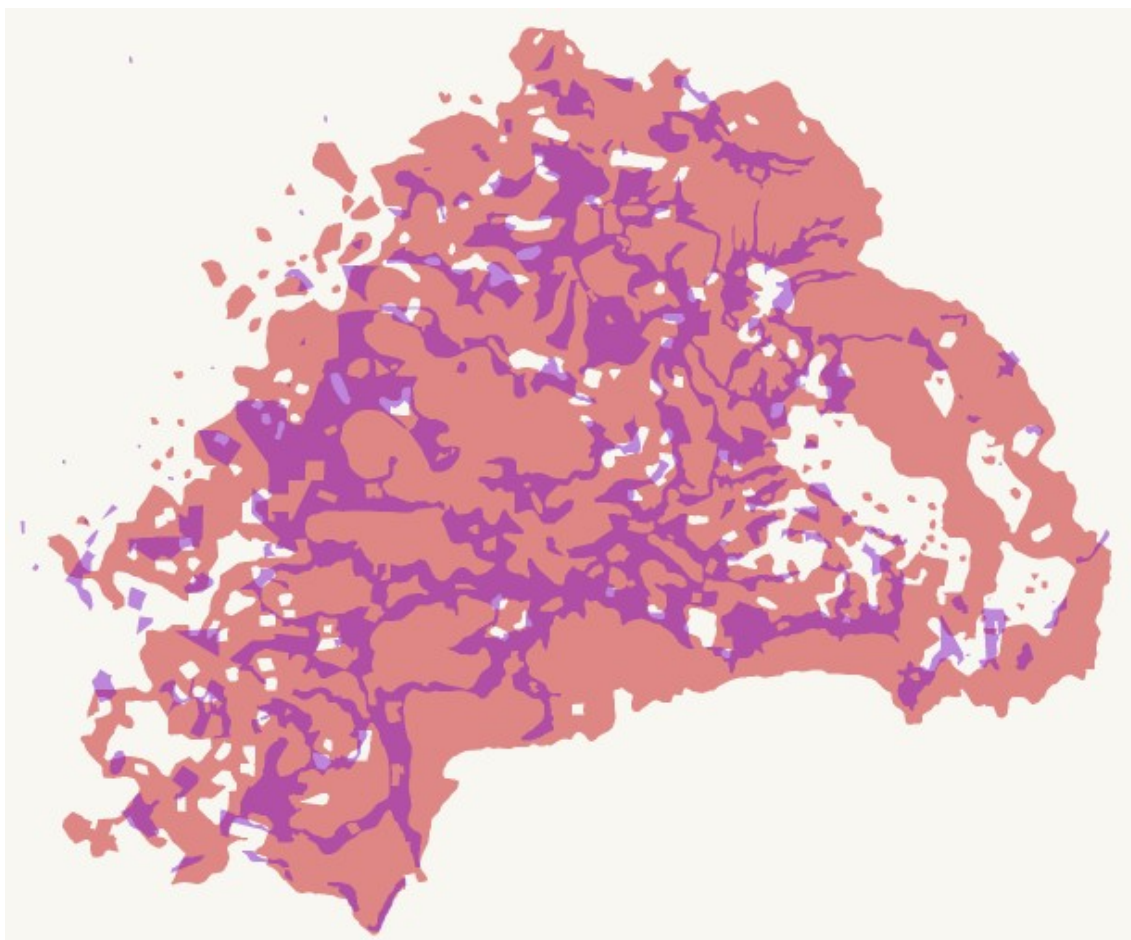


Figure 1. Screenshot taken from the GIS application. Romanians in Transylvania based on the map by Paul Teleki (purple) and by Prof. S. C. Demetresco (red). Dark purple shows the areas where both authors claim Romanians live. One can clearly see that the map made by Demetresco shows a much larger area inhabited by Romanians than the map made by Teleki.

Projections of maps which do not have a grid cannot be determined with acceptable accuracy, so it is impossible to convert these to a uniform projection.

The system is a very good way for giving modern functionality to old maps which may be hundred years old. It is an excellent way to compare the thematic contents of the maps. Some maps have a very accurate projection and grid, which makes them good candidates for vectorisation in the system, but their thematic contents have poorly defined and inaccurate geometries leading to problems with georeferencing. Maps that have accurate thematic contents have very precise geometry, so these maps can all be georeferenced. These differences can be seen very well in this GIS system. While the original maps are not visible in the system, a reconstruction which is visible has a some extra features as discussed above. Therefore one can safely say that this system is an interactive reconstruction of old maps in a GIS database.

References

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