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The Third Dimension in Noise Visualization – a Design of New Methods for Continuous Phenomenon Visualization

P. 1-17

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Abstract

3D cartographic visualization of a continuous time-dependent phenomenon is not an easy task. The focus of this research is motivated by the struggle to visualize such a phenomenon. Based on the current state of the art, we implemented new visualization methods to visualize continuous time-dependent phenomena. All visualizations are based on the use case of road-traffic-generated noise in outdoor urban areas. These visualizations utilize the third dimension of the map scene. The first two methods focus on the variations of the noise in the vertical dimension (i.e. height). The third method is based on the idea of space–time cube and therefore utilizes the time variable as the third dimension. For demonstration purposes, all methods were implemented in an online application. Furthermore, user testing of those applications was conducted. This paper thus describes design, implementation and user evaluation of newly proposed methods for third dimension visualization.

Multi-Criteria Geographic Analysis for Automated Cartographic Generalization

P. 18-34

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Abstract

Cartographic generalization is a process similar to text summarization that transforms a map when scale is reduced. Cartographic generalization simplifies the map content while preserving as much as possible the initial characteristics and spatial relations of the map. The automation of this process requires a deep understanding of the context of each map feature, which involves different criteria such as the shape of the feature, the semantic nature of the feature, or the spatial patterns of its neighbouring features. This is why multiple criteria decision techniques can be relevant during the process. This paper proposes two use cases of cartographic generalization sub-tasks where multiple criteria decision techniques improve past techniques: the classification of urban building blocks and the ordering of the buildings to keep in the map as a priority. In both use cases, the proposed methods are experimented on large real cartographic datasets, and evaluated in comparison to alternative techniques.

Choriented Maps: Visualizing SDG Data on Mobile Devices

P. 35-54

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Abstract

Choropleth maps and graduated symbol maps are often used to visualize quantitative geographic data. However, as the number of classes grows, distinguishing between adjacent classes increasingly becomes challenging. To mitigate this issue, this work introduces choriented maps (maps that use colour and orientation as variables to encode geographic information) and choriented mobile maps (an optimization of choriented maps for mobile devices). The maps were evaluated in a graphical perception study with Sustainable Development Goal data of several European countries. Choriented maps and choriented mobile visualizations resulted in comparable, sometimes better effectiveness and

confidence scores than choropleth and graduated symbol maps. The two visualizations also performed well regarding efficiency and only performed worse than graduated symbol maps. These results suggest that using colour and orientation as visual variables in combination can improve user performance and their selection of map symbols during the exploration of geographic data in some scenarios.

Technical Evolution of Flood Maps Through Spanish Experience in the European Framework

P. 55-68

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Abstract

Flood maps group different types of cartographies related to flooding and the components and variables of flood risk and its mitigation measures. This paper analyses the most important facts in the development of flood mapping in Spain and assesses the current. While 60/2007 EU Directive has been an important step for mapping risk, future developments must: (i) overcome the concept of return period; (ii) incorporate other aspects of the European Directive, basically vulnerability and susceptibility to flooding from rainwater, also the effect of climate change on flood hazards; (iii) include scenarios for the consequences of climate change; (iv) incorporate risk cartography as a key element of 'green infrastructure', like tool in spatial planning; (v) Reduce the map representation scale; (vi) incorporate new elements within risk maps to improve emergency management; (vii) improve public-private cooperation; (viii) facilitate the legal use of hazard and risk maps in administrative and court processes.

Creation of Tourist Maps Series as a Type of Regional System Tourism Mapping

P. 69-82

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Abstract

This paper emphasizes the role of cartographic modelling of tourist routes in the Carpathians in the context of the development of tourist mapping. It describes the distinguished features of Transcarpathian and Eastern Carpathian tourist routes as the objects of mapping. These routes are extremely popular among tourists due to their remarkable recreational and touristic value. Tourist map series fulfil the needs of tourists and also form a relevant and promising practical area of modern geographical mapping. We systematise the principles and describe the methodological basis of cartographic modelling of tourist routes in the Carpathians. We particularly detail the peculiarities of the decoration of tourist maps. Our research contributes to the development of the integral system of spatial, visual, complementary, and comparative information about the region's location, conditions, and features of natural, historical, cultural and socio-economic tourist resources.
