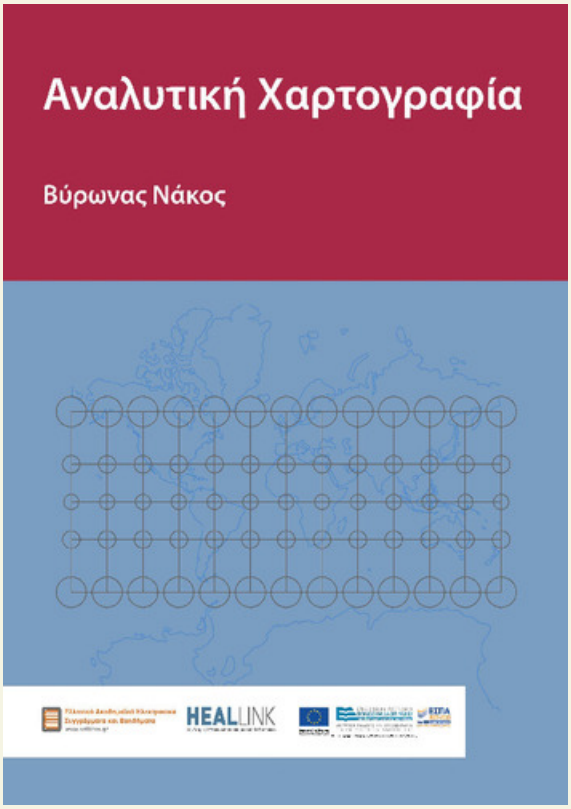

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Abstract

The first part of the book (Chapters 1-5) focuses on the study of map projections from the surface of an ellipsoid of revolution or a sphere on the plane. First, the geographic coordinate system is established. Then, the study of the deformations of lengths, angles or areas of elementary as well as finite sizes during their projection on the plane is presented. In the next chapter, the normal cylindrical, conic and azimuthal projections are described. The section concludes with the presentation of transverse and oblique projections. The first part of the book concludes with the description of the cartographic systems that were applied in the Greek area as well as the existing methods of coordinate conversion between different projections. In the second part (Chapters 6-11), cartographic transformations are presented. First, the methods of extracting quantitative information from maps (cartometry) are analyzed. Then, the ways of measuring lengths, areas as well as the determination of volumes from measurements on maps are descussed in detail. The section concludes with an analysis of the relationship between cartographic measurements and map scale as well as an analysis of the techniques of spatial sampling. In the next section, the principles of the mathematical process of one-dimensional interpolation are described. Next, the digital representation techniques of the relief of the Earth's surface are presented, followed by a comprehensive presentation of the existing cartographic methods for the analytical determination of hillshading of the relief. Next, the geometric transformations used in many cartographic applications, as wel as, the visualization methods of focal/multi-focal projections that topologically transform the geographic space are analyzed and described. In the last section, the operators and algorithms used in the cartographic generalization process are analyzed.

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