

On-line Integration of Photogrammetric and CAD Systems using an Object Oriented Interface in order to Produce Fully Structured Data for GIS with Emphasis on Road Feature

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Abstract

One of the most significant resources for spatial data preparation to be entered in GIS, is known as produced spatial data by photogrammetric methods. The conventional method meant for aforesaid data production including their preparation for entering to GIS, which is carried out after feature digitization in the form of digital maps, is time consuming and costly and due to the fact that it is done without using photogrammetric model, would cause in diminishing data reliabilities. (off-line approach)

Considering robust editing tools in which standard CAD environments as external digitizing environment of most of photogrammetric systems provide for users, and alleviating the spatial data preparation manner to be entered in GIS, also regarding object oriented systems capabilities in modelling, and controlling of logical and topological relations among features, it is doable to utilize on-line integration of photogrammetric and CAD based systems using an object oriented interface in order to prepare spatial data during digitization process of a photogrammetric model on the basis of logical relations among features (On-line approach).

In this paper, different stages of design, implementation, and testing of a new software called OCBPS2 (Object Oriented CAD-Based Photogrammetric System) as an object oriented interface system intended for on-line integration of PhotoMod digital photogrammetric workstation and Microstation software as a standard CAD environment are explained. Due to the importance of features in road class of topographic maps, structuring of these features based on controlling logical and topological relations among existent features in the road class and also other features in related classes are thoroughly described.

In this respect, logical and topological relations among existent features in road class have been explored with their owns as well as other features in other related classes. In OCBPS2, it is possible to enter attributes data by user and applying it so as to construct a better establishment of logical and topological relations among existent features in road class themselves and features in other classes.

The successful test of this system without requirement of output data re-editing to be entered in GIS, shows that using logical relations among features is a proper method for automatic elimination of the most part of produced errors in spatial data production line to be entered in GIS as well as structuring them with features digitization operation from photogrammetric model simultaneously (on-line approach).

Using integration systems in structured spatial data production manner for GIS, not only reduces cost and time of spatial data production but also maintains their reliabilities.

Key Words: Attribute data, spatial data, Object oriented system, Road feature, CAD, GIS, Photogrammetry, On-line Integration