

PhD THESIS ABSTRACT
„DIGITAL ELEVATION MODELING BASED ON MULTIMODAL AEROSPACE
DATA”

Author: eng. **Florentin Boda**

Email: florentin.boda@gmail.com, *tel:* +40 727 360 188

PhD Supervisor: col.(r) prof. univ. dr. eng. **Dan-Gabriel RĂDUCANU**

In recent years, there has been considerable development in both the acquisition and processing of geospatial data. Whether it is the sensors, the platforms on which they are mounted or the software for data processing, all have also brought benefits to obtaining digital elevation models that can be used in a wide range of applications.

Over time, there began to be multiple data coverages for the same areas, which provided the opportunity to compare technologies and resulting products for optimal use for various purposes. At the same time, the multiple coverage of the same area or complementary data led the studies to the next level: the fusion of digital elevation models.

For Romania, there is currently a great lack of digital elevation models with coverage and up-to-date throughout the country, which would allow the applicability of modern processes in various civil fields, such as the environment, territorial planning, urban planning, emergency management and but also national defense.

The PhD thesis focused on two directions, the study and comparison of different technologies for obtaining digital altimetric models, respectively the fusion of digital elevation models, with particular applicability to the context of Romania, both in the military and civil fields.

Given that the possibility of benefiting from current data sets soon is small, the objective of the proposed fusion methodologies has become that of generating new data sets, based on characteristics of the existing ones.

In the first methodology, a fusion process was proposed to update a digital terrain model with national coverage and to allow its use in a wider range of applications. In this case, the digital terraing model, although with a resolution that offered it a high applicability, was no longer up-to-date, the data source being from 40 years ago. In the second methodology, a fusion process was proposed based on which the errors of a digital elevation model recently obtained by InSAR technology were corrected. The input digital elevation model was obtain at a global level, with a higher resolution than those in the same category. Thus, although with a smaller range of applications compared to the first methodology, it has the advantage that a digital elevation model with regional or national coverage can be obtained in a much shorter time.

The objective of the research studies was achieved, the methodologies being validated by examples, using appropriate reference data. Also, regarding the quality of the results, an algorithm was proposed to ensure the quality of the data in an optimal process.

The role of this thesis is to contribute to provide of digital elevation support in various civil and military fields, using existing data at the level of the Romanian territory, eliminating or reducing both time and financial limitations.