

SUMMARY

HABILITATION THESIS

THE IMPACT OF CURRENT TECHNOLOGIES ON TERRESTRIAL MEASUREMENTS

DOMAIN: MINING, OIL & GAS

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The habilitation thesis presents my academic, professional and scientific evolution after 2010, until 2025. It is structured in three parts.

The first part consists of chapters on:

- *Scientific, professional and academic achievements between 2010 and 2025*
- *Research using scanning techniques*
- *Research in the field of the behavior of constructions and land over time*

Scientific, professional and academic achievements 2010 – 2025

This chapter highlights for the first time *the continuous professional training* by attending courses and specializations between December 2010 and January 2020. A second aspect is given by *the didactic and publishing activity*. After 2010, the year in which I obtained the title of doctor in engineering sciences of the University of Petroșani with the thesis *Tracking excavations up to date through digital technology*, under the guidance of Professor Nicolae Dima, I continued my teaching activity by teaching courses at the Department of Land Measurements and Cadastre. Among the courses taught, I mention *Cadastru III, Cadastru IV, Geodetic Instruments and Measurement Methods*, *courses* in which there are both some works in the field of specialized cadastres and research on important characteristics of topographic apparatuses such as total stations. The discipline *Multidimensional Modeling of Terrestrial Information* - discipline within the master's program - *Geoinformatics Systems in Cadastre and Urbanism*, has as didactic support a good part of the book *The Third Dimension in Cadastre*. I consider that it represents a beginning in the introduction of the 3D cadastre in Romania. From the point of view of the published articles, I mention that I tried to continue my research on the use of scanning techniques in the field of positioning underground voids ("*Inventory by terrestrial laser scanning of the resources of the caves in the Apuseni National Park*", Volume of the papers of the symposium with international participation "GeoPreVi 2011", pp. 441-448, ISBN 978-973-100-162-3, UTCB,

Bucharest, 2011 authors: Aurelian Stelian Buda, Ștefan Suba, Andreea Florina Jocea, Sorin Nistor, Norbert Szabolcs Suba, Alin Marius Moș.) but also in the calculation of excavated volumes from surface mining works (Buda Aurelian-Stelian, Eva Magdolna Koncsag, Norbert-Szabolcs Suba – "Stone quarry scanning techniques using DR Total Stations", GIS OPEN 2010, Székesfehérvár, Hungary Link: <http://w20.gisopen.hu/archiv/2010/eloadasok/pdf/buda.pdf>)

The chapter - **RESEARCH USING SCANNING TECHNIQUES** highlights the evolution of the scanning techniques used by me and by the staff of the Land Measurements and Cadastre department of the Faculty of Construction, Cadastre and Architecture in the period 2010-2025. All the results obtained and presented in the thesis represent a continuous and sustained work. It is worth noting that we used both fixed scanners and mobile systems. Comparing the results obtained by them by measuring the same locations or objects will represent future research.

The chapter - **RESEARCH IN THE FIELD OF THE BEHAVIOR OF CONSTRUCTIONS AND LAND OVER TIME** - is a dynamic chapter because work is still being carried out on some of the projects presented. It represents a combination between the managerial part and the provision of topographic data to specialists in the field of construction and geotechnics.

The second part is focused on **PLANS FOR THE EVOLUTION AND DEVELOPMENT OF THE ACADEMIC CAREER.**

This chapter refers to the connection between the academic, didactic and professional sides. A first aspect presented is related to increasing the visibility of the TCM department, an aspect that can be achieved through the publication of articles, teaching materials and broader involvement in contracts with the socio-economic environment.

From the point of view of the teaching activity, I consider it necessary to update the courses taught in the context in which new technologies for taking over terrestrial information appear or specialized geoinformatics systems take the place of specialized cadastres. Professionally I have to develop continuously. Referring to the field of cadastre, here there are challenges in all three essential directions. Technically, the dynamics are visibly related to hard and soft-components without which the cadastre activity can no longer be carried out. Legal is the component with which we must be constantly acquainted, and the economic part can be an area in which, through

new working methods (3D Cadastre), we can contribute to another form of taxation of all constructions.

The third part contains **BIBLIOGRAPHIC REFERENCES**

The content of this part is structured in three categories of bibliographic sources. The first category is given by my own works – respectively with reference to books and courses published by me or in collaboration. The second category is scientific articles and the third category is given by internet sources.