

Training in Mapping Changes on Archaeological Site

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SUMMARY

Teaching geomatics is a continuous challenge with the evolution of technologies, which open the access to surveying techniques to a broader community of users and students. This article presents an original pedagogical approach based on a teaching unit gathering students in architecture, as well as in civil and environmental engineering. Working together to collect and visualize data from the built and natural environment with advanced tools like laser scanners is a very stimulating experience that requires multiple competences in mapping and data analysis.

At the Ecole Polytechnique Fédérale de Lausanne (EPFL), the Faculté de l'Environnement Naturel, Architectural et Construit (ENAC) has introduced a teaching concept called “Projeter ensemble” which consists in a series of multidisciplinary courses. During the second year of the BSc, all the architecture and engineering students are distributed in mixed groups of approximately twenty. Each group works on a specific topic for one week (semaine ENAC). Throughout the spring semester of the third year, groups of approximately twelve spend almost one day per week on a specific project (Unité d'Enseignement). The pedagogy is based mainly on practical experiments led by teachers from different domains. Within this interdisciplinary context, the analysis and the quantification of the changes of natural and built environments are investigated and documented using advanced technologies for surveying and mapping.

This presentation focuses on a project carried out in an antique theatre, on the archaeological site of Aventicum (now Avenches, CH), which is one of the major Roman settlements in Switzerland. On such a site, the data acquisition is a real challenge because each part of the building has its own importance and no construction has a regular shape, unlike modern ones. Both scales are important: the overview of the site and the detail and location of each stone. For this reason the students have combined different geotechnologies for the acquisition, analysis and visualization of data.

The teaching unit has been proposed for 4 years. During this period, restoration works of the antique theatre have taken place and the archaeological site has been surveyed regularly. Hence it is an excellent opportunity to analyse the evolution of the theatre through the comparison of 3D surface models from different epochs.

In conclusion, the students benefit from an excellent field of experiment. They collect real data and build 3D models, which they analyse with adequate software. In this sense, they develop very good skills in data processing and in quality assessment of the mapping products. This teaching unit does not aim at training a few specialists in geomatics. However it contributes towards the critical use of modern mapping tools by professionals in widespread domains of activities, making them aware of some difficulties behind colourful user interfaces.