3D time-lapse monitoring of quarries and gravel pits

Project Description

Extraction sites in the Canton of Vaud have produced 1.76 million m$^3$ during the year 2015. Added to imported volumes from abroad (0.54 million m$^3$), the volume of (rocks, gravel, sand, etc.) produced and consumed in the canton was greater than 2.3 million m$^3$, which corresponds to about 3 m$^3$ per inhabitant per year. At the pace of the current economic situation, operating gravel pits and quarries in the Canton provide cantonal reserves for no more than 4 years.

In order to cover the growing demand, 32 new gravel pits and quarries sites will be developed and opened in the next ten to twenty years. In this context of development and rationalization of cantonal resources, a 3D modeling tool to monitor the operation (variation of volumes) of extraction sites will enable more precise management of the different sites in operation.

The aims of this project is to develop a methodology to model extraction sites in 3D with the help of drones, and to develop a tool to visualize in 3D the precise evolution in time of these extraction sites.
Objectives and tasks:
The project's objectives and tasks are the following:
1. Acquisition of spatial data in swiss extraction sites with a drone
2. Development of a dynamic 3D model over time
3. Development of a tool enabling the visualization of the evolution of 3D models (i.e. time-lapse)

Importance of the project
Students will develop their knowledge and experience in those domains:
- Work on the field
- Drone photogrammetry
- Spatial data management
- Development of a tool for 3D time-lapse visualization

Report will be delivered in English or French.

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