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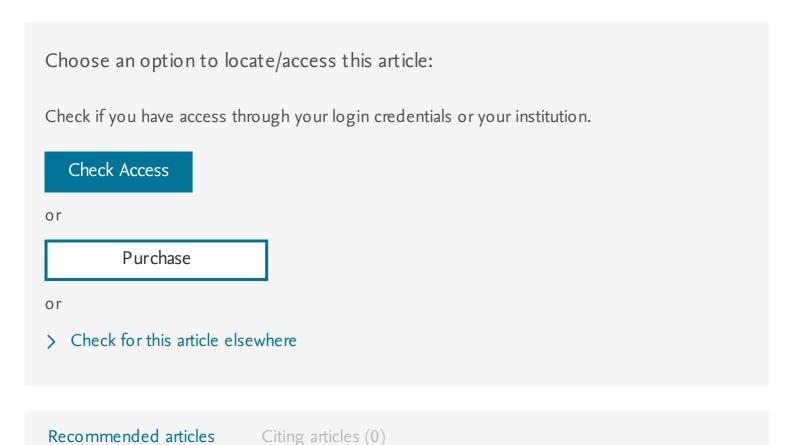
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## Abstract

3D geometric modeling consists of representing geometric and spatial relationships of volumetric objects. We think it could be helpful in the context of archaeological excavation units representation and analysis. This article presents a procedure developed to generate 3D models from GPS positions taken at the top and the bottom of the excavation units boundaries on the archaeological site of Tell â€˜Acharneh (Syria). It shows and discusses two geometrical modeling approaches (voxel and tetrahedral) used in the Gocad 3D modeling tool. Once excavation units are geometrically modeled, it is possible to refer them within a trench or the entire archaeological site, to handle them in various ways (zoom, rotation, translation), to perform on them 3D spatial analysis such as volumetric calculus or intersection computation, to make various kinds of queries such as to find out excavation units that have a certain number of artefacts, to generate

sections anywhere in the 3D model, and finally to publish it with VRML (Virtual Reality Modular Language). As well as improving data analysis techniques, we think that if this 3D modeling operation can be done during the excavation, it could greatly help archaeologists to plan more efficiently their daily excavation strategy.

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## Keywords

Excavation units; 3D geometric modeling; Voxel; Tetrahedron; 3D data

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