

Alternative to unmanned aerial vehicles – original photogrammetric method of generating digital terrain model and orthomosaics of archaeological sites.

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Archaeological research, especially field excavation research, despite due diligence, may lead to irreversible damages. That is why preparing detailed and comprehensive documentation is essential part of archaeological work before and during exploration of archaeological sites. In such cases, unmanned aerial vehicles (UAVs) are currently widely used to register state of preservation of archaeological sites and objects. Data collected by UAV allows to generate digital terrain models (DTMs) and orthomosaics. In turn, they (along with results of other research, such as geophysical surveys) form the basis for selection of excavation areas.

In this paper authors present process of DTMs and orthomosaics of archaeological sites generation without using UAV. The studies in order to provide documentation of two archaeological sites in southern Jordan: the ancient city of Tuwaneh and the Roman fort in Dajaniya, were conducted as a part of the BARI -Buildings ARcheology Inventory project, which was carried out in cooperation with the Institute of Archeology of the Jagiellonian University in Cracow. Unfortunately, due to formal regulations using UAV in the territory of Jordan was not possible (no permission to import and use UAV from the Jordanian government administration). Therefore, it was decided to collect survey data with the use of alternative method – GoPro action camera mounted on boom. In this article, authors describe the full methodology of conducting measurements and the results of tests aimed at determining the accuracy of generated photogrammetric products. Optimization of ground control points was discussed along with amount of images collected. Referential measurements were carried out by means of FARO FocusM70 laser scanner and close range photogrammetry.