

## Description and implementation of Orthorectification algorithms within COSCH<sup>KR</sup>.

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### Abstract:

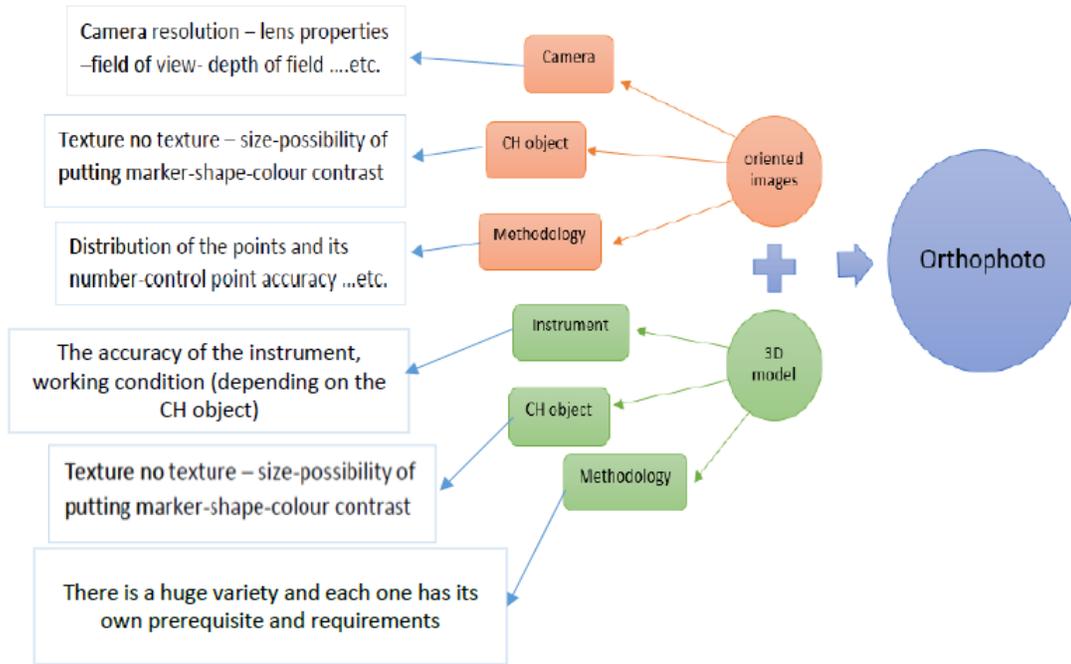
The main purpose of this STSM is to integrate the Orthorectification task within COSCH<sup>KR</sup> and to set the prerequisite for the system from input, output, condition, camera calibration, precondition and all the parameters which could affect the result of the Orthorectification in a way that allows the inexpert user to implement the Orthorectification by providing the system with the necessary parameters. In addition, to describe the different possibilities to implement the Orthorectification process and evaluate the different possible accuracies.

Cultural Heritage archiving has been applied by different means and techniques. The best way to achieve the desired result, is simply depending on many factors that determine by three main aspects. The three aspects are Application, Data and Technologies which are the elementary indicator to the knowledge-based representation and COSCH objectives. Due to the application aspect, Orthophoto has been determined as the result. Whereas it has Orthogonal projection, Uniform scale and no relief displacement. Therefore we know what we are seeking and in which accuracy. Consequently, this would lead us to the data aspect, which is in our case the CH object and its environment. These two aspects together determine which technologies could be used and in which level of accuracy, with respect to the project or the task budget.

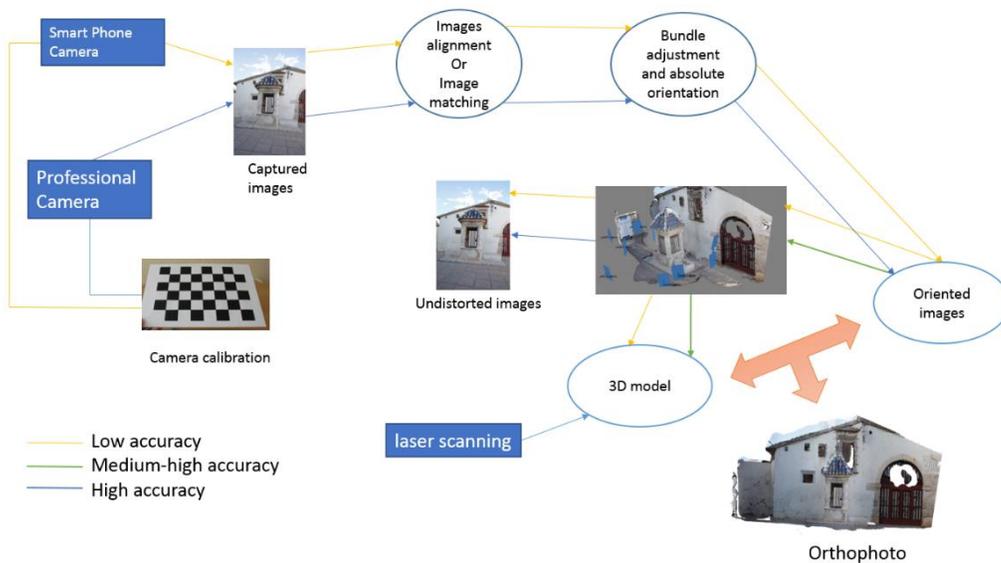
Orthorectification process input has been split into two inputs flowing the ontology's data definition. These inputs are 2D data (oriented image/s) and 3D or 2.5D data. During the projection process comes the determination of projection plane; plane on which the image or the images will be projected. The assessment of the Orthorectification process accuracy and its result, has been split into two parts, the accuracy of the oriented images and the accuracy of the 3D model. The accuracy of the oriented images depends on three factors; the camera, CH object and the methodology of the orientation. For the accuracy of the 3D model three factors play a major role in the determination; instrument, Methodology and the CH object itself.

These descriptions have been implemented by three different data sets. Two sets have been taken by different instruments for the same object under the same conditions. A comparison has been made to assess the accuracies. Different projection planes have been used for the same parts as well to emphasize the importance of the projection plane determination. The third set has been taken for another object to investigate Orthomosaic characteristic and the bi-side result e.g. undistorted images.

The process has been broken down into sub-tasks and discussed separately in a way that helps to be formulated within the ontology system.



*Accuracy determination factor Orthorectification process*



*Graphical abstract for Orthorectification process.*