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ORIENTATION STRATEGIES FOR AERIAL OBLIQUE IMAGES

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Abstract. Oblique aerial images become more and more distributed to fill the gap between vertical aerial images and mobile mapping systems. Different systems are on the market. For some applications, like texture mapping, precise orientation data are required. One point is the stable interior orientation, which can be achieved by stable camera systems, the other a precise exterior orientation. A sufficient exterior orientation can be achieved by a large effort in direct sensor orientation, whereas minor errors in the angles have a larger effect than in vertical imagery. The more appropriate approach is by determine the precise orientation parameters by photogrammetric methods using an adapted aerial triangulation. Due to the different points of view towards the object the traditional aerotriangulation matching tools fail, as they produce a bunch of blunders and require a lot of manual work to achieve a sufficient solution. In this paper some approaches are discussed and results are presented for the most promising approaches. We describe a single step approach with an aerotriangulation using all available images; a two step approach with an aerotriangulation only of the vertical images plus a mathematical transformation of the oblique images using the oblique cameras excentricity; and finally the extended functional model for a bundle block adjustment considering the mechanical connection between vertical and oblique images. Beside accuracy also other aspects like efficiency and required manual work have to be considered.

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