EXTERIOR ORIENTATION OF LINE-ARRAY CCD IMAGES BASED ON QUATERNION SPHERICAL LINEAR INTERPOLATION

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ABSTRACT:

Since the exterior orientation elements of line-array CCD images are highly correlated, normal collinear equations that computing these elements are ill-posed and the error of the least square estimation is very large and the solution strongly depends on the initial value. For solving this problem, this paper puts forward an algorithm to compute the exterior orientation elements based on quaternion spherical linear interpolation. Firstly the quaternion is used to describe the attitude of the image, and then spherical linear interpolation is used to gain the attitude of any line in this algorithm, lastly a model of exterior orientation elements is build and is used in exterior orientation. Experimental results indicated that the method could effectively overcome the correlation problems of exterior orientation elements and the positioning accuracy is very high, and the reliability and stability of this algorithm are both independent of the initial values of exterior orientation elements.

TOPIC: Geometric modeling
ALTERNATIVE TOPIC: Geometric modeling