DIGITAL WATERMARK TECHNIQUE FOR PROJECTIVE−DISTORTED IMAGES USING COLLINEAR POINTS (TueAmPO1)

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Abstract :

Detection of a digital watermark in images distorted by geometric transforms is made difficult by the so−called synchronization problem. Many watermarking methods have been developed to be robust against an affine transform. Based on such assumption, those methods fail under a more general projective transform. In this paper, a method that is invariant to planar projective transform is presented. The method is based on a projective invariance property of the cross−ratio of four collinear points. Based on four coplanar points as obtained by extracting feature points from the host image, two sets of three collinear points are obtained. From each set of three collinear points, each watermark embedding location can be obtained through its cross−ratio relationship with those aforementioned three collinear points. A method to increase the number of embedding points in addition to those primarily derived from these sets of collinear points is also proposed.
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Abstract : (cont.)

An algorithm to form a set of four coplanar points from feature points is also described.