New View Synthesis from Plural Images Using A Trifocal Sensor Data Structure In A Multi-View Parallax Geometry (Yissum)

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Abstract

The invention is embodied in a process for synthesizing a new image representing a new viewpoint of a scene from at least two existing images of the scene taken from different respective viewspoints. The process begins by choosing a planar surface visible in the at least two of the existing images and transforming the at least two existing images relative to one another so as to bring the planar surface into perspective alignment in the at least two existing images, and then choosing a reference frame and computing parallax vectors between the two images of the projection of common scene points on the reference frame. Preferably, the reference frame comprises an image plane of a first one of the existing images. Preferably, the reference frame is co-planar with the planar surface. In this case, the transforming of the existing images is achieved by performing a projective transform on a second one of the existing images to bring its image of the planar surface into perspective alignment with the image of the planar surface in the first existing image. Preferably, the image parameter of the new view comprises information sufficient, together with the parallax vectors, to deduce: (a) a trifocal ratio in the reference frame and (b) one epipole between the new viewpoint and one of the first and second viewpoints.

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