

论文

利用标准线性四元-八元树由正交三轮廓图识别三维客体

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摘要

线性八元树提供一种非常紧凑并适于传统客体处理运算的三维客体体积表示法。然而, 利用体积交技术由正交三轮廓图生成三维客体的线性八元树表示取决于观察点。匹配客体到模型达到识别目的需要客体表示独立于观察点。为了得到独立于观察点的表示, 应通过计算惯量矩阵的特征向量确定客体的三个主轴。线性八元树投影到三个主视(沿着主轴)的图象平面上得到三个标准线性四元树。客体匹配包括两步过程: 第一步是利用对称差的度鞋匹配待识别客体的标准线性四元树到库中一模型子集; 第二步是生成客体和这些候选模型的标准线八元树, 然后匹配待识别客体的标准线性八元树到具有最小对称差的模型。

关键词 [标准线性四元-八元树](#) [正交三轮廓图](#) [主轴](#) [客体匹配](#) [对称差](#)

分类号

IDENTIFICATION OF 3-D OBJECTS FROM THREE ORTHOGONAL VIEWS USING NORMALIZED LINEAR QUAD-OCTREES

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Abstract

Linear octrees offer a volume representation of 3-D objects, which is quite compact and lends itself to traditional object processing operations. However, the linear octree structure for generating the representation of 3-D objects from three orthogonal views by using the volume intersection technique is dependent on viewpoints. The recognition achieved from matching object representations to model representations requires that the representations of objects are independent on viewpoints. In order to obtain independent representations on viewpoint, the three principal axes of the object should be found from the moment of inertia matrix by computing its eigenvectors. The linear octree is projected onto the image planes of the three principal views (along the principal axes) to obtain the three normalized linear quad-trees. The object matching procedure has two phases: the first phase is to match the normalized linear quad-trees of the unknown object to a subset of models contained in a library, utilizing a measure of symmetric difference; the second phase is to generate the normalized linear octrees of the object and these selected models and then match the normalized linear octree of the unknown object to the model with the minimum symmetric difference.

Key words [Normalized linear quad-octrees](#) [Three orthogonal views](#) [Principal axes](#) [Object matching](#) [Symmetric difference](#)

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