Automatic 3D CAD models reconstruction from 2D orthographic drawings

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Résumé
This paper introduces a two-stage approach that automatically generates 3D CAD models from 2D orthographic drawings. First, a pattern-matching algorithm is proposed to reconstruct a network of 3D edges by matching 2D edge features extracted from the multiple views of the 2D drawing. Second, starting from the resulting 3D wireframe and generated graph, a loop detection algorithm allows identifying possible loops of faces. Then, a clustering algorithm recognizes the faces from the set of detected loops. The reconstruction ends while trimming and stitching the faces to get a watertight ready-to-use 3D CAD model. This approach has been validated on a public dataset composed of several thousands of 3D objects, and it achieved 99.59% of well-reconstructed models in F-score.

Mots-clés : Multiple-view 2D engineering drawings, CAD model reconstruction, wireframe and surface modeling, pattern matching, clustering algorithm.