The research of 3D models reconstruction form 2D engineering drawings for die compouents

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ABSTRACT

In response to the grown-up technology and the extensive use of 3D solid model in CAD system in today''s industry, the needs for the reconstruction of the traditional 2D orthographic engineering drawings into 3D solid model are still existed and required in industry especially when the new products are redesigned from the modification of old product under its cost reduction and development time economics requirement . The main concern of this paper is the reconstruction of B-rep solid model from the three 2D orthographic drawings. In the reconstruction , we first read the 2D drawings and build up the possibly existed 3D edge lines and vortex by the projection rule. To rule out the redundant edge lines, we use the following two ways: (1)use the relation of geometric and topologic data and the distinction between the solid or dot lines in 2D drawings, and (2)ues of path-removing rule to the connection of the profile surface loop. After the above process, if there still exist the redundant surfaces, it is necessary to process again by using the surface revoving rule. Finally, the B-rep solid model is completely constrcted by using the relation of 3D vortex, edge line and surface profile. In addition, to obtained a succesful reconstruction process， our system provide a DCL window for manual process for a complicated case to compensate the insufficient design consideration. The whole system is programmed by Borland C++ Builder 3.0 and performed under the WINDOWS/95/NT4.0 plateau.

Keywords : press die components ; 2D orthographic Engineering dwawing ; Solid model reconstruction ; B-rep ; path-removing rule

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