A Study of Different Surface Moldels in Die Design and Manufacturing

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ABSTRACT

The most difficult thing in shape die design is to handle geometeic surfaces, especially irregular surfaces such as sculptured surfaces or free-form surfaces that are not easy to design and manufacture. Most domestic die manufacturers are small scales which lack of R&D in die design and manufacturing. So developing the irregular surfaces for die design and manuf- acturing to promote the industrial technology is the most important task. In engineering drawing design, analytic entities which can be expressed by a single mathematical formula are known very well. However, non-analytic entities which can not be expressed by a single mathematical fornula are unfamiliar. Software in personal computer seldom supported non- analytic entities funct- tion, thus the develop of free-form surface models is limited. The utilization of non-amalytic entities must be adopted by polynomial functions to produce synthetic Bezier, B-splines, NURBs curves and surfaces. How to develop a PC based free-form surface models will be importane to us. This thesis is under AutoCAD working environments. First, free-form curves are established by AutoLISP language. Then curves are extended into surface models or solid models. It also can be constructed directly by AutoLISP. Finally, the construted free-form surfaces can do cutter pathes simulation.

Keywords : Sulptured Surface ; Free-Form Surface ; Non-Analytic Entities

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