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球形齒輪運動分析與曲面幾何之研究
Study on the Spherical Gear with Motion Analysis and Surface Geometry

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中文摘要

由於仿生機器人肘關節的運動，與自然界中絕大多數的動物關節運動相類似，一般為雙自由度的運動機構。從幾何學的角度上來看即是共軛曲面的嚙合問題，因此，本論文用雙參數包絡理論，來研究球面齒輪的運動機構，試行建立了球面齒輪的曲面數學模式；同時也為球面齒輪的加工製造提供了可行的理論分析與製造方法。

關鍵字：形齒輪運動；曲面幾何

Abstract

Because the natural animal joints look like the exercise of the robot elbow joints, their motion mechanism is a pair of freedom degree. From a geometric viewpoint, the spherical gear is a pair of conjugate surfaces on the conjugate problem. Therefore, the paper uses the two-parameter envelope theory to study the spherical mechanism. The mathematical model of spherical gear can be obtained. Simultaneously, the paper can apply the mathematical model to manufacture and analysis.