

一种新型机器人三维力柔性触觉传感器的设计

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摘要:

基于柔性力敏导电橡胶材料, 设计了一种能测量三维力的新型机器人柔性触觉传感器。研究了力敏导电橡胶材料的压阻效应, 阐述了触觉传感器的设计思想, 分别进行了触觉传感器单元设计和阵列结构设计和研究。获得了计算三维力的数学模型, 并通过实验进行了三维力的验证。结果表明, 设计的机器人三维力柔性触觉传感器具有设计简单, 造价低廉, 柔顺性好等优点, 而且布置成阵列结构可用于医疗、体育、机器人等领域中检测三维力信息。

关键词: 触觉传感器; 导电橡胶; 柔性; 三维力

A New Design of Flexible Three-Dimension Force Tactile Sensor of Robot

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Abstract:

This paper designs a new robot flexible tactile sensor that can measure three-dimension force based on flexible pressure-sensitive conductive rubber. It studies on the piezoresistive effect of pressure-sensitive conductive rubber, illustrates on the designing thoughts of tactile sensor, and researches on the tactile sensor's unit design and array structure respectively. It obtains the mathematical model of calculating three dimension forces, and gains the verification of three dimension force by experiments. The results indicate that the designed three-dimension force flexible tactile sensor for robot has the advantage of simple design, low costs and fine flexibility. Besides, it can be disposed in array to acquire the information of three-dimension force in medication, physics and robots, such kind of fields.

Keywords: Tactile Sensor; Conductive rubber; Flexible; Three-Dimension Force

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