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基于Stewart平台的六维力/力矩传感器各向同性的解析研究

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ANALYSIS OF ISOTROPY FOR THE SIX-AXIS FORCE/TORQUE SENSOR BASED ON STEWART PLATFORM

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摘要

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摘要 对于 Stewart平台的六维力 /力矩传感器的雅可比矩阵进行了解析推导,用解析的方式求出它的奇异值。并对基于矩阵谱范数的条件数进行了研究,得到传感器的各向同性与其结构尺寸间的解析关系,为传感器性能指标的评价及其结构优化设计提供了一种较好的借鉴方法

关键词: 六维力/力矩传感器 雅可比矩阵 条件数 各向同性

Abstract: Jacobian matrix of the six axis force/torque sensor based on a Stewart platform is analyzed, and singular values are obtained by matrix transform. Relationship between isotropy and frame dimension is derived from analysis of the condition number based on the matrix spectral norm, which provides a better method for evaluation of the performance index and optimization of the framework for the force/torque sensor.

Keywords: six-axis force/torque sensor Jacobian matrix condition number isotropy

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