Tolerance Analysis and Validation of Assembled Parts

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ABSTRACT

This thesis is based on the geometric building block concept, and represent the adjacent relationship between geometric building blocks by graph representation feature, dimension and tolerance graph. In the graph, the node represents the geometric building block. The arc represents the dimension adjacent relationship of two geometric building blocks. And using the geometric building block ’s parameter, degree of freedom, to detect over- and under- constraining conditions. When the feature, dimension and tolerance graph is well-defined, it will be the foundation of tolerance allocation, then perform tolerance allocation by linear programming. Based on the design database, the program developed by this thesis contains two main modules and several subsidiary programs. The two modules are：(1) file conversion module, (2) Building validation graph module.

Keywords : graph representation，degree of freedom，tolerance allocation，linear programming

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