A Research for the Component-Based Modular Analysis of Varied Products

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ABSTRACT

In order to solve the problem of rising components which cause by variety of products. Through the modularity lets designers or manufacturers have more flexibility to create new products or rise the functions to products. Traditions modular research was based on the Liaison Graph that depends on the knowledge of designers. In my research, I used the scoring card to evaluate the engineering characteristics to the liaisons of components. Through the matrixes of liaisons and the function of distance, I tried to use the distance to show the degree of difference between the liaisons. Then, I used the Minimal Spanning Tree Algorithm to produce the assembly graph before assembling. After choosing a base part, the components have been clustered together. Then, I used the distance of Barry center to compare the difference to each cluster and found the liaisons that need to be changed. In this research, I used two simple products and revised the scoring card, tried to use the value of distance to find the relationship and variable of components from reusing, redesigning and merging.

Keywords : Product Variety ; Modularity ; Minimal Spanning Tree Algorithm ; Liaison Graph ; Base Part ; Barry Center

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