

The “Generation Gap”: A CSP Approach Linking Function to Form Grammar Generation

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ABSTRACT

The authors use a Constraint Satisfaction Problem (CSP) approach to the assembly problem linking a function-based design generation algorithm to a geometric modeler. The goal is to create a unified graph-grammar based design generation tool that enables generation of geometrically valid designs from a functionally valid design concept. The paper demonstrates the Assembler, a graph-grammar based algorithm that takes a functionally valid but geometrically ambiguous design of a cart made of Meccano Erector Set components and converts it into valid solid models of cart designs. The authors show that the approach has potential but that even the simple cart example requires more sophisticated constraining than was done in this implementation.

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