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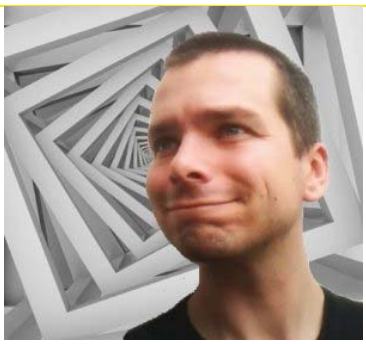

Paper: **Structural Synthesis using a Context Free Design Grammar Approach**

Abstract:

This paper introduces Structure Synth, a 3D structure generator based on design grammar specifications.

Noam Chomsky pioneered the use of formal grammars to describe the structure and syntax of language [1]. These formal grammars were classified according to their expressive power. Of special importance here is the class of Context Free Grammars, originally believed to be powerful enough to model natural languages.

While Chomsky's formal grammars describe structure in one dimensional strings (symbolic sequences), Chris Coyne created the Context Free Design Grammar [2], an extension of the formal grammars modelling two dimensional structures using a simple set of primitives (e.g. squares and circles).

Structure Synth is the natural extension of these ideas into three dimensions. The user specifies a grammar, and the program generates one of the many possible structures adhering to the syntax of the grammar. Compared to general-purpose programming, the restrictions of context free systems encourage the user to discover and explore the systems. And even though the syntax limits the complexity of the rules, the resulting structures are often highly complex and nearly always unpredictable and surprising.

Structure Synth is open-source (GPL/LGPL), cross-platform (Windows/Mac/Linux) and can be freely downloaded at [3].

Topic: Grammar Based Design

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References:
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Keywords:
Structural Synth, Context Free Design Grammar.