Grammar Analysis

Abstract Syntax Tree

- Represents everything we need for DGG grammar rules.
- In DGGML we this is a data structure to represent the grammar.
- Analysis is ran on this grammar data structure.

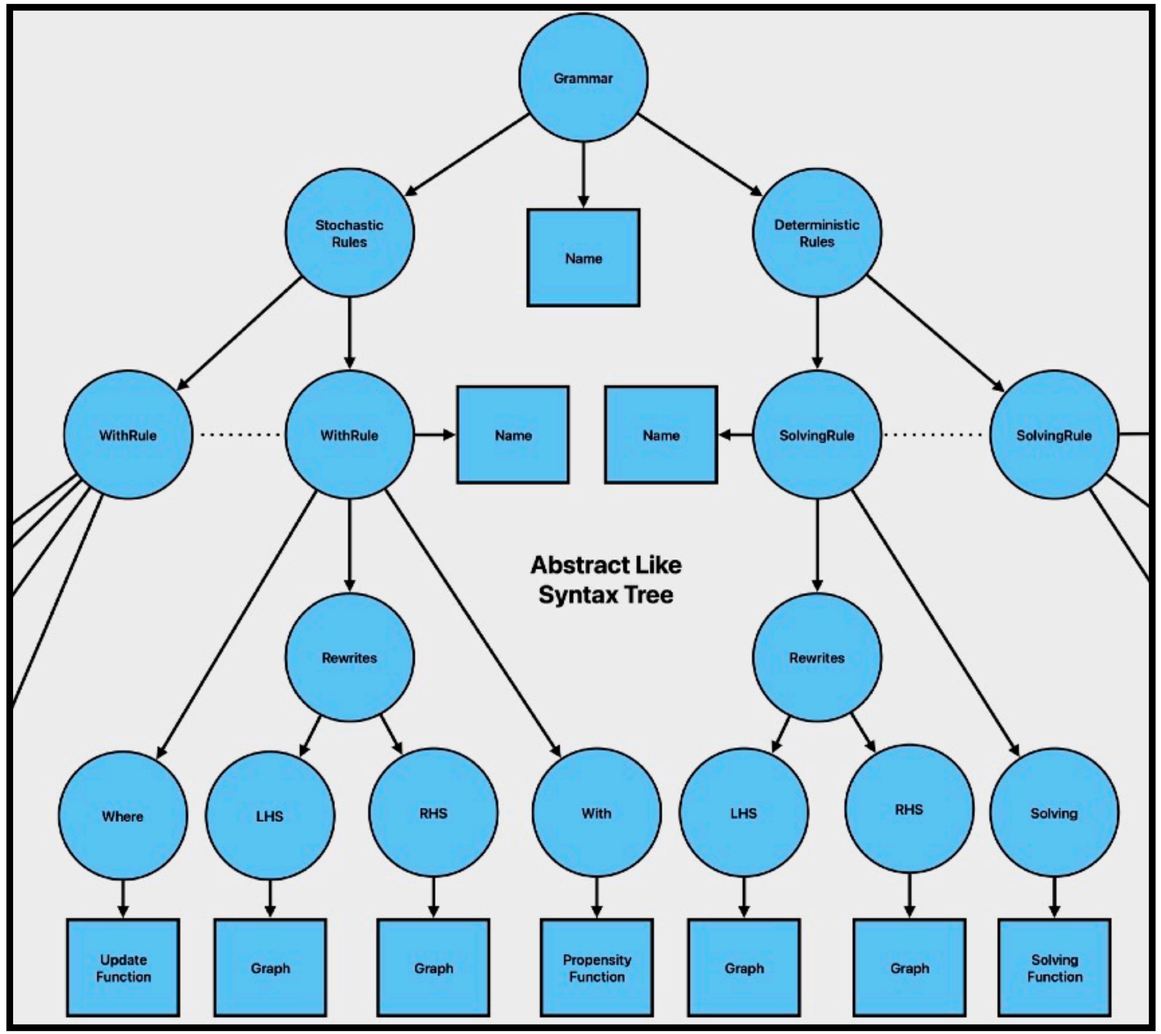

Figure 20: A section of an abstract syntax tree (AST) for a DGG.

Grammar Analysis

Examples of Semantics and Rules as Data

- Rules can be directly represented as data.
- Each rule name is checked to be unique.
- The propensity and update functions are lambdas an injected into the approximate algorithm.
    - DGGML enforces constraints on the input and output, but not on functions contents.
- Rules may share isomorphic connected components of LHS or RHS graphs.
    - Efficient analysis takes advantage of this.

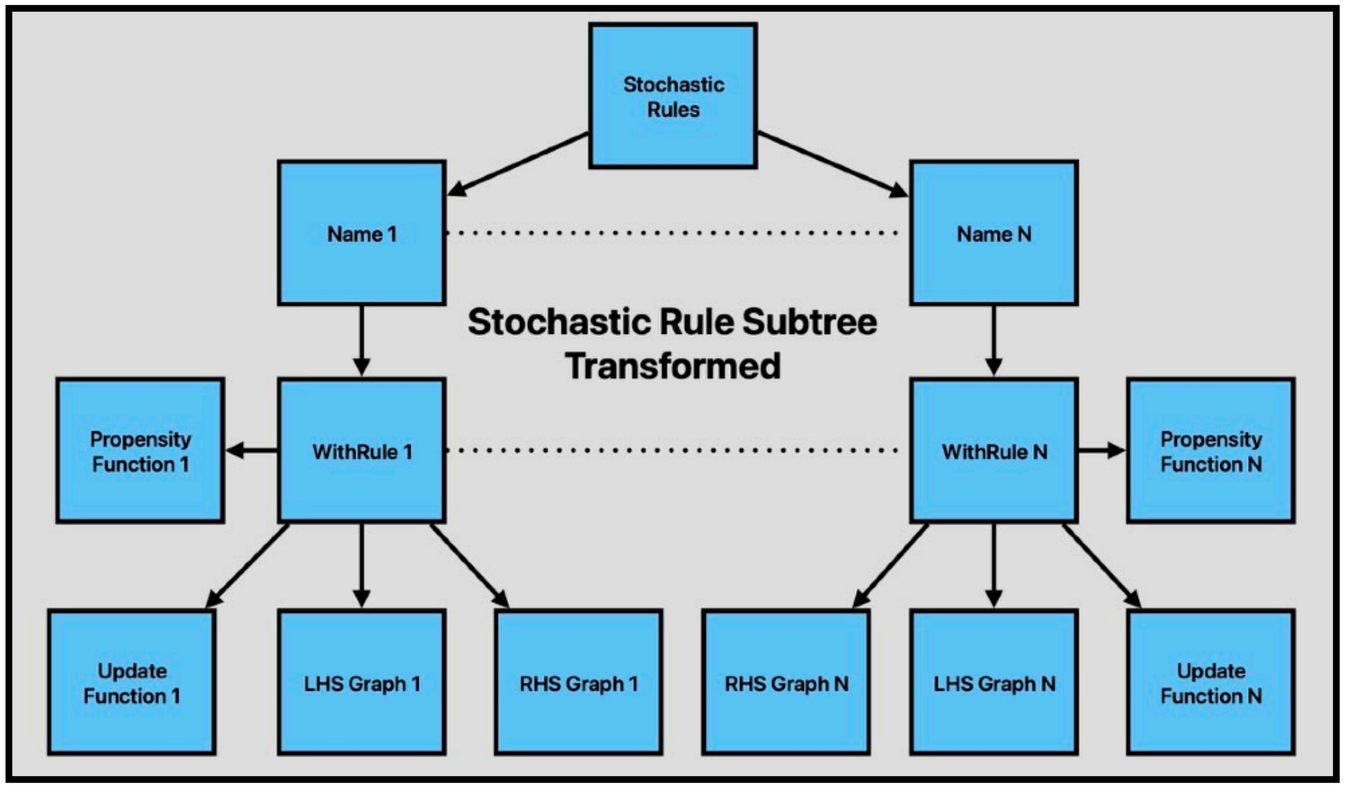

Figure 21: A transformed stochastic rule subtree, originating from an abstract syntax tree representing a grammar.