David W. Franke

Position Statement

Trilogy Development Group
6034 West Courtyard Drive
Austin, TX 78730
franke@trilogy.com
Voice: (512) 794-5900
FAX: (512) 794-8900

Potential Contribution: Trilogy offers a commercial configuration solution that is being applied throughout the sales process from point-of-sale to manufacturing. Trilogy's configuration technology accepts input specifications in terms of high-level needs and complete or partial lists of components to be used in the configuration. Trilogy's configuration solution is currently being used in multiple domains including the following: computer configuration (PC, workstation, mainframe, and supercomputer hardware and software); telecommunication configuration (PBX, routing switches); transportation (airplanes, trucks, automobiles); modular furniture configuration; configuration of custom manufactured materials; and services.

While addressing these configuration domains, Trilogy has accumulated over 150 person years of experience in building configuration solutions, in the form of a configuration engine and configuration models. Trilogy has unique experience in breadth of domains examined and in numbers of configuration solutions implemented and delivered. Trilogy is the "configuration" company Edward Feigenbaum discussed in his "Tiger in a Cage" talk at AAAI-93.

Trilogy's configuration representation is model-based, using an ontology consisting of functions, components, and complex, inter-component and component/function relationships. Components and functions are organized in a type hierarchy, with relationships (manifested in configuration conditions) associated with types. Our configuration approach is constructive, goal-oriented search. The input specification identifies components and/or functions defined in the configuration model that have associated configuration conditions. Intra-component and inter-component relationships can also be declared in the input specification. These configuration conditions define intra- and inter-component and function relationships that must be established during the construction of the resulting configuration. These configuration conditions also contain heuristics that guide the search when alternative configurations are possible.

Listed below are some of the specific configuration issues Trilogy has addressed:

- topological reasoning/configuration (e.g., cabling, networks)
- spatial reasoning/configuration
- modifying/upgrading existing configurations
- abstract input specifications (user functional requirements vs. specific components)
- scalability (tens of thousands to millions of configurable components)
- multi-purpose configuration models; a single model supports multiple use scenarios:
Motivation for Participation: In addition to providing a unique perspective on the configuration problem and current approaches, we are interested in keeping abreast of and fostering research in configuration.

Related Work: In addition to implementation of the Trilogy configuration engine and developing models for Trilogy customers (in various domains), I have in previous professional positions participated in commercial product development of:

- expert system shells
- decision analysis tools
- electronic CAD tools

My research activities include:

- electronic CAD (design knowledge representation)
- model-based reasoning
- function representation and functional modeling
- design rationale (dissertation title "A Theory of Teleology")

Publications:


