

Context

Knowledge-based Configuration, Qualitative Reasoning, Constraint Programming, Artificial Intelligence

Background

TUM's Model-based Systems & Qualitative Reasoning group is currently engaged in developing a generic, constraint-based configuration system called GECKO. The project aim is to develop an application-independent software solution for solving user-focused configuration problems.

In general, configuration is the task of composing standard components into a system that satisfies the users or developers requirements. For assembling the system it is often not only necessary to select component, but to structure them. The type of structure depends on the application domain. For example in the current GECKO system INFIS (Intelligent Fitnessstudio), it is necessary to order a sequence of components depending on temporal relations. Other application can require spatial or hierarchical relations.

Task

The outcome of this thesis shall be a generic concept for structural relations in configurations as well as prototypical implantation of one type of structural relations in the GECKO system, e.g. hierarchical relations. To this end, the following tasks are required:

- Analysis of structural relations and existing techniques for structuring configurations
- Modeling of structural relations for configurations
- Development of a generic concept for structural constraints in GECKO
- Modeling of one type of structural constraints for GECKO
- Feasibility and practicality of the developed concept have to be proven in a prototypical implementation

All steps have to be carefully documented.

Prerequisites

- All prerequisites for a Master's Thesis
- Experience in .net / C# or in another OO programming language
- Interest in Artificial Intelligence

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