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Title:

Extended Variability Models, Algebra, and Arithmetic

Abstract:

Although classic variability models have been traditionally used to specify members of a product-line, their level of expressiveness was quite limited. Several extensions have been proposed, like numerical features, complex cardinalities and feature and configuration attributes. However, modern tools often provide limited support to these extensions. Imposing variability modelling restrictions into general theories enables off-the-self automated reasoners to analyse extended variability models. While one could argue that those general theories are less reasoning efficient, in practice happen the same if we extend traditional solvers. In contrast, general theories provide new properties with the potential to a) improve reasoning efficiency above extending traditional solvers, and b) provide exotic analyses that uncover new properties of the variability models and feature and configuration spaces. Examples of this could be the functions commutativity property, (reasoning) functors composition, and the fundamental theorem of calculus applied to feature or configuration space.