Aggregating Asymmetric Requirements by Intuitive Interfaces

Abstract:
Many real-world evaluation tasks are composed of mandatory and optional requirements, e.g., spacious basement or else spacious attic and low price and if possible short travel distance. Thus, the human-computer interaction should also cover the natural human evaluation of mandatory and optional requirements in the conjunctively polarized evaluation, as well as full and optional requirements in the disjunctively polarized evaluation. An example of a compound requirement is \((\text{most of } \{P_1 \ldots P_n\}) \text{ and if possible/or else } (\text{most of } \{Q_1 \ldots Q_m\}))\), where requirements \(P_i\) \((i = 1\ldots n)\) and \(Q_j\) \((j = 1\ldots m)\) might be fully or partially satisfied. Fuzzy sets and logical aggregations are able to manage these tasks effectively. Logical aggregation covers cases from the slight to full relevance of optional requirements. The key factor for applicability is the design of an intuitive user-friendly interface, where users are able to linguistically express atomic requirements and preferred aggregations, whereas the mathematical formalization is beyond the interface. The applicability is in cognitive cities, medical diagnoses, tailored motivation, interactive machine learning and smart participation among others.

Bio:
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