Software

VIP Analysis

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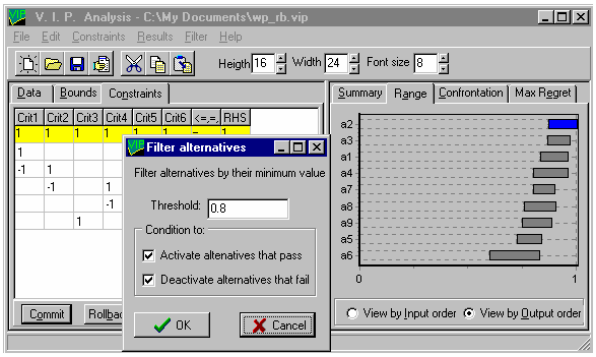
The VIP (Variable Interdependent Parameters) Analysis software has been built to support the selection of the most preferred alternative among a list, considering the impacts of each alternative on multiple evaluation criteria. It is based on an additive aggregation model (value function), accepting imprecise information on the value of the scaling coefficients (a.k.a. scaling constants, which indirectly reflect the weight of the each evaluation function).

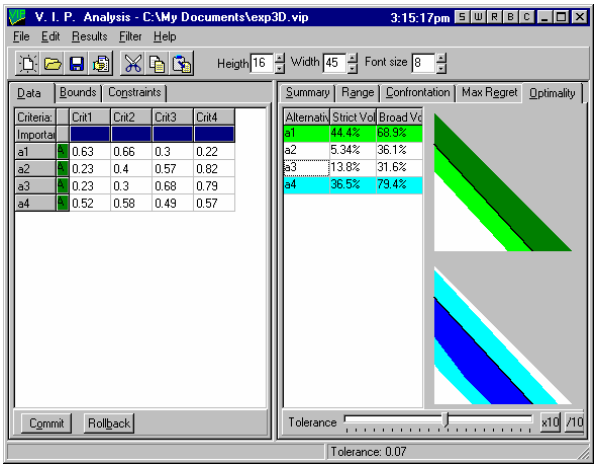
Rather than precise values, the scaling coefficients are considered Variable Interdependent Parameters subject to a set of constraints (e.g. bounds, order relations, or any linear constraints). This type of problems are often referred to as "partial information", "poor information", "imprecise information" or "preference programming" ones. VIP Analysis considers multiple acceptable combinations of values for these parameters, which is particularly relevant despite the simplicity of the model.

Indeed, fixing precise values for the scaling constants is often difficult because these values reflect the judgment of the decision makers, which may evolve through time and may be hard to elicit in a precise way. The number of arbitrary options in the process of building the criteria, plus the possibility of divergence among several decision makers may further hinder the requirement of precise numerical figures.

The VIP Analysis software offers its users user-friendly tool to analyze a choice problem by using multiple approaches at several levels of detail, when imprecise information is accepted. Namely, it computes:

- the best and worst overall value that each alternative may attain (given the multiple acceptable inputs);
- the pairwise confrontation table (maximum differences of global value between pairs of alternatives), which allows to discover alternatives that are "dominated" in the sense that there is another one that has always the same or better overall value (again, given the multiple acceptable inputs);
- the maximum loss of opportunity associated with choosing each alternative ("maximum regret");
- the graphical representation in the parameter space of the domain where each alternative has the best value (where it is "optimal") in problems with 2 degrees of freedom (number of criteria minus numeber of equality constraints, e.g. precise trade-offs).





A distinctive feature of VIP Analysis is the possibility of controlling interactively a tolerance parameter to know which alternatives are quasi-optimal or quasi-dominated. Another of its characteristics is that it accepts any kind of linear constraint on the parameters. Plans for the continuation of this project include offering the use of "wizards" for the insertion of constraints, volume computation tools, and the development of a Group Decision Support System (see 2nd reference below).

VIP Analysis is distributed for free to anyone interested who contacts the authors. In four years (since 2000), VIP Analysis has been requested by almost one hundred users (academics and others) from several countries, besides Portugal: Argentina

(4), Australia (3), Brazil (28), Canada, China & Taiwan (3), Colombia, Cuba, Czech Republic, Egypt, Ecuador, Finland, France, Greece (2), Italy (7), Japan, Malaysia, Maroc, The Netherlands, New Zealand, Poland, Russia, Slovenia, Spain, Switzerland, UK (4), USA (3), Venezuela and Vietnam.

References

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