Can we learn preferences and values?

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General idea

If “x” is an observable choice

then “x” is preferred to any “y” and thus $\forall y \; v(x) > v(y)$

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If I have sufficient examples of satisfactory choices

then I can estimate the function v and $\forall z$ “new” I can compute the value and decide if it is interesting.

General problems

- An observable choice is not necessarily the result of a rational decision process (such that can be modelled through a rational model).
- Even if it is the case, a model explaining a set of observable choices does not necessarily accounts for the complex behaviour of the decision maker.
- Even if it is the case, the validity of this model is bounded in time and by context and only holds for the observed decision maker. Rationality is subjective.

Remarks

The bounded validity of “learned preferences” is related to:

- the decision process for which preferences have been stated;
- the decision aiding process where the “learned preferences” are going to be used.

Preference statements

- Absolute vs. relative preferences.
- Single vs. multi-attribute preferences.
- Simple vs. extended (multi-item) preferences.
- First vs. second order preferences.
- Any combination of the above.

Formal models

- Preference structures and graphs. Weak orders, Semi-orders, Interval orders and other threshold structures.
- Measurement. Numerical representations of preference structures. Ordinal, Ratio and Interval scales.
- Conjoint measurement. Same as above, but about multi-attribute, multi-dimensional structures.

Learning

- Preference elicitation protocols.
- Parameters estimation for a given model.
- Model learning.
- Graph mining.
- Process mining.