VERIFICATION VALIDATION METHODS

PROJECT of the PEGASUS FAMILY

PSM FORMALISATION – COMPUTABLE RULES

Overview of modelling and formalisation of facts and rules

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Basic Idea

A building block of the PSM is the definition of rules on facts. In order to be accessible for computers, facts have to be formalised. The first step is to introduce so called *Indicators*.

1st Step

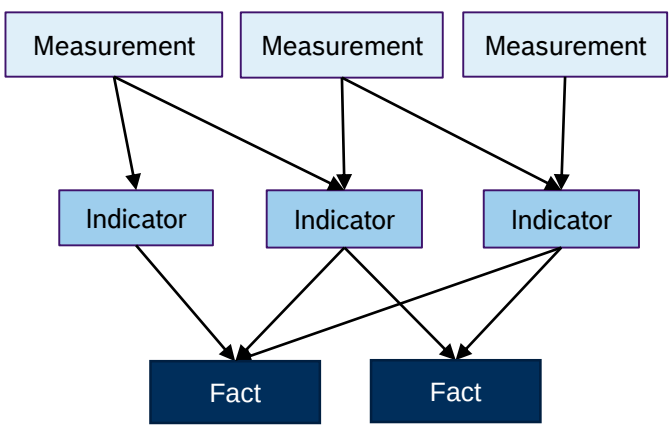
An Indicator can be understood as the basic unit of information. Therefore, in the context of PSM, Indicators represent signals. Indicators are recognized via measurements. So this statement hold:

- An Indicator is given IFF all the measurements associated with it are given.
- A fact is given IFF all the associated Indicators are given.

2nd Step

In the second step, the Indicators are formalised using this properties:

- Indicators are related to ontologies, which model relevant aspects of the world like position, direction etc.
- Indicators get discrete outcomes (in the PSM formalism called „effects“.



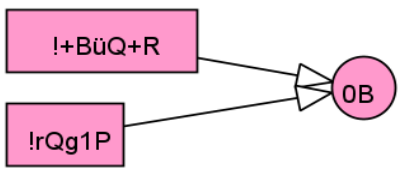
Indicators describing facts

The following table shows an simple example (values are all symbolic):

Indicator	Meaning	Values
P	Position	b1, g1…
Q	Quality	r, f, ü,
A	Size	p, f, l,
R	Direction	+, -, <, >
B	Movement	0, +, - <, >

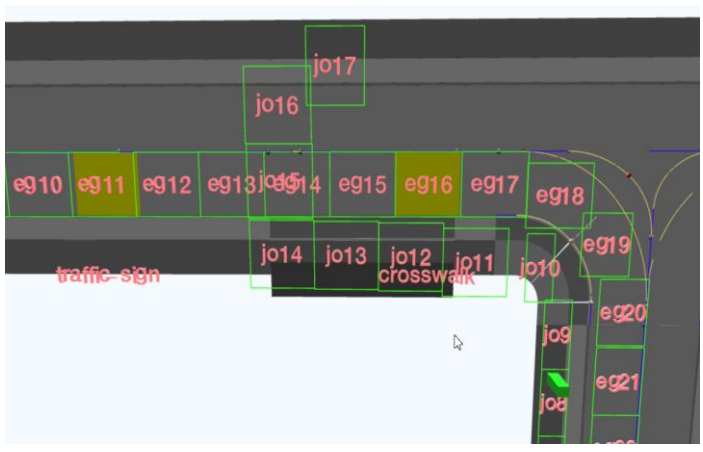
3rd Step

A fact can need many Indicators. In consequence, a fact is defined by a sequence of pairs $e_i C_i$, where the e_i are the effects (the symbolic values), the C_i represents the Indicators. In general, a fact *b1PrQ* is different to *rQb1P*. Now rules can be expressed as



4th Step

Space has to be discretised in zones of interest for getting abstract positions, see the screenshot of a PSM Graph Builder session below:



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