

Verifying the On-Line Help System of SIEMENS MR Tomographs using SAT

Consistency Checking of On-Line Documentation

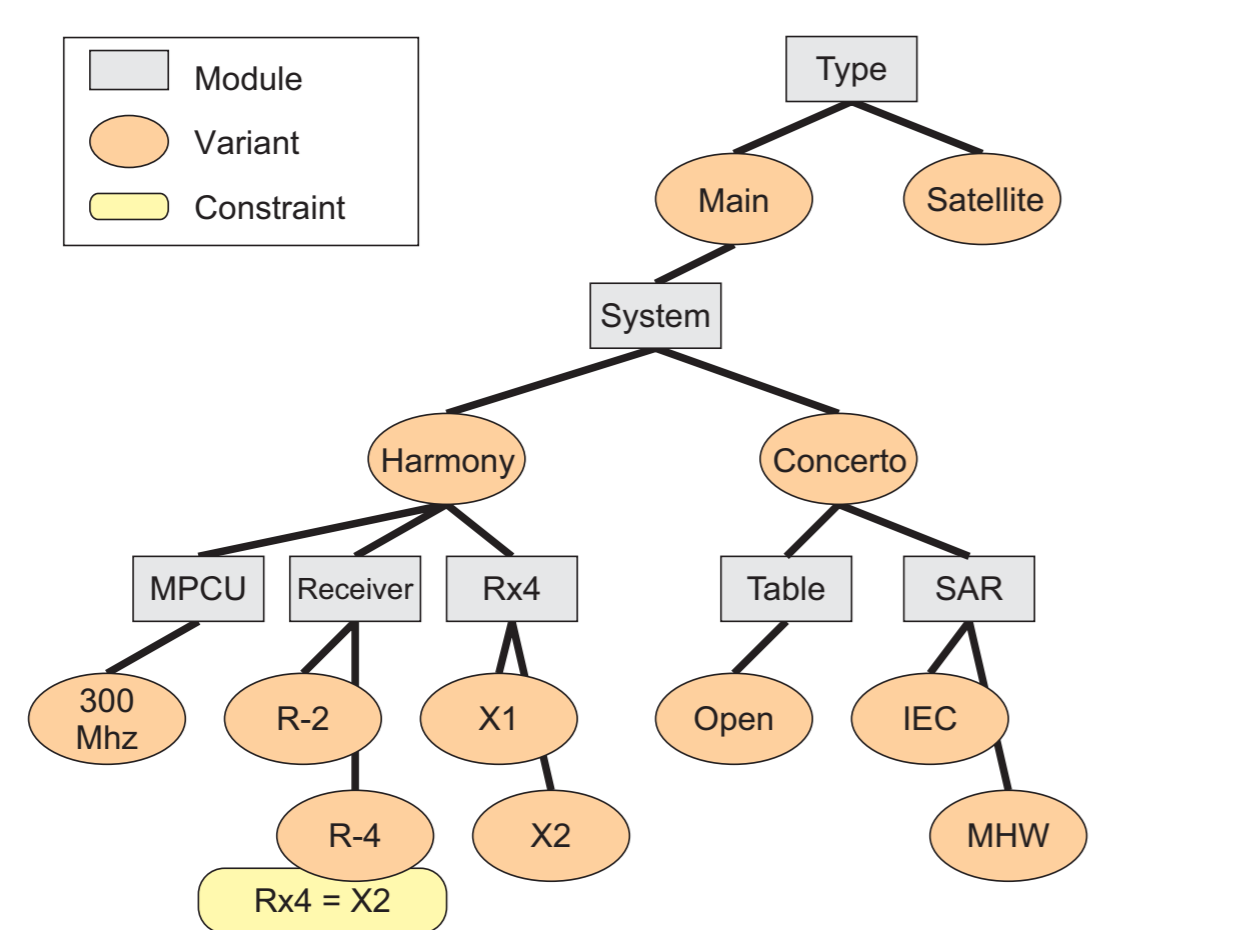
- Modular products and modular on-line help system: Help packages (sets of HTML pages) are associated with propositional formulae that describe matching product configurations
- **Problem:** Is the on-line help system consistent (no help package overlaps) and complete (no missing packages)?
- Formulated as SAT problem, check validity of:



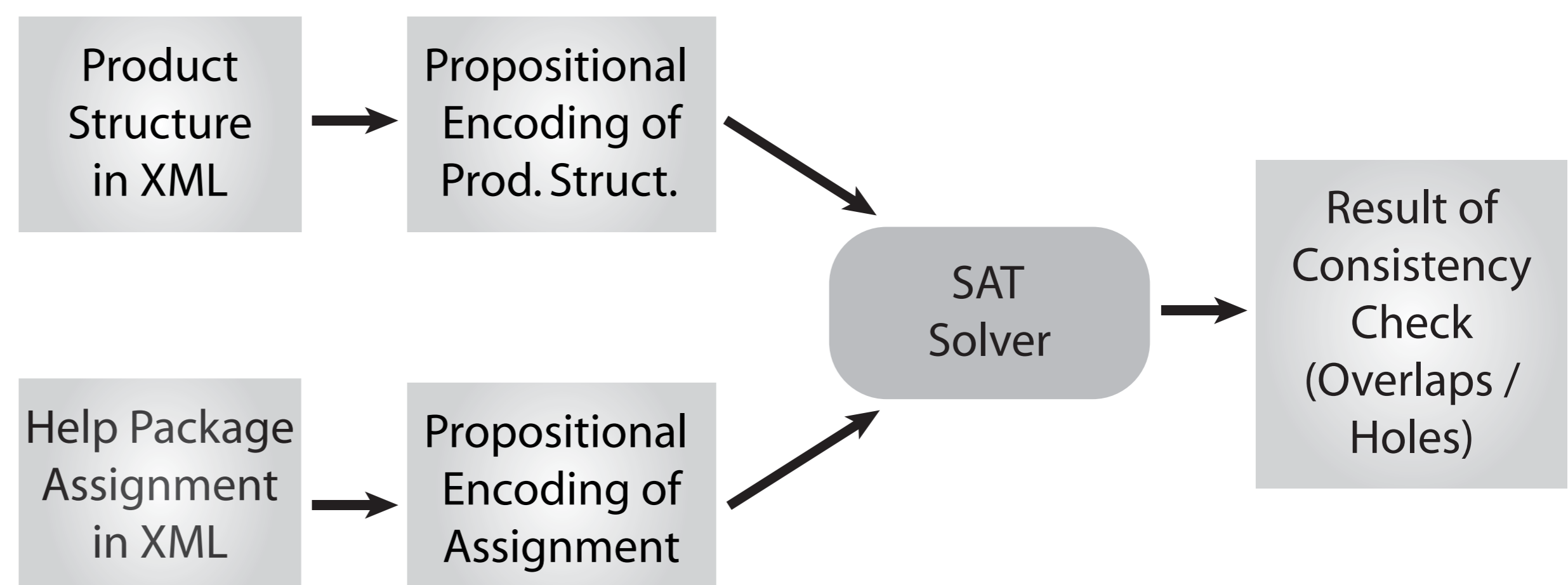
$$\text{HelpReq} \wedge \text{ValidConf} \Rightarrow \bigvee_{p \in \text{HelpPackages}} \text{HelpProv}(p)$$
$$\text{HelpReq} \wedge \text{ValidConf} \Rightarrow \neg(\text{HelpProv}(p_1) \wedge \text{HelpProv}(p_2))$$

Real-world problem with natural formulation as SAT.

Systematics of SAT Encoding and Consistency Check



Product Structure of MR Tomographs



Background: Product Configuration

Configuration deals with **modular, customer-adaptable** products:

- » Which selections of components are admissible and make up a valid product (considering compatibility restrictions)?
- » Which product matches a customer's intention most closely?
- » Impact on parts selection, production, (on-line) **documentation**, ...

