Planics 2.0 - a Tool for Composing Services
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**Web service composition problem**
- SOA concept: simple, independent components with well-defined interfaces
- the most common SOA realization: Web services
- Web service composition for realization of complex objects
- automatic composition relieves a user of:
  - manual preparation of execution plans
  - matching services to each other
  - choosing optimal component providers

**SMT-based abstract planning**
- Abstract planning problem for a query \(q\) encoded as the formula \(\varphi^q_k\)
- \(\varphi^q_k\) is satisfiable iff there exists a solution for \(q\) of the length \(k\)

**Planning phases**
- abstract planning
- searching for abstract plans - multisets of service types
- SMT- and GA-based planners
- multiset exploration - finding CAPs
- concrete planning
- querying registry and Web services
- collecting offers and constraints
- choosing the best offers
- SMT, GA, and hybrid planners

**PlanICS system architecture**
- user interface:
  - ontology browser
  - plan viewer
  - plan executor
- execution of plans
- a user query
- abstract plans
- service selection
- context:
  - abstract plans
  - plans
  - offers
  - service registry
  - service provider
  - source of semantics

**Key concepts of PlanICS**
- Static knowledge (ontology)
- Dynamic knowledge (WS offers)
- User intention (query)

**Ontology**
- OWL + embedded PlanICS language
- Service types - representing groups of services of similar functionality
- Artifacts - types of objects processed by services
- Stamps - special object types describing certain execution features

**Hybrid concrete planning**
- Combining advantages of both algorithms
- Short time \(\checkmark\)
- Good quality \(\checkmark\)
- High probability \(\checkmark\)

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