## SFB 378 - Fortsetzungsantrag (4. F rderperiode: 2005, 06, 07) zu Teilprojekt MI 2 CHORUS: Semantische Verarbeitung mit Constraints u. Pr ferenzen

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## MI 2 CHORUS: Semantic Processing with Constraints and Preferences

Antragsteller: Manfred Pinkal / Gert Smolka (COMPUTERLINGUISTIK/INFORMATIK)

**Contributions of CHORUS 1-3:**

- Development of the CLLS formalism for representing scope, anaphora, ellipsis, and their interactions. Supports further phenomena, such as reinterpretation.
- Solution procedures for CLLS including parallelism constraints.
- Efficient algorithms (based on finite set constraints and graph algorithms) for solving dominance constraints.
- Formal relationships between dominance constraints and other underspecification formalisms (Hole Semantics, MRS). Result: Semantics construction for large HPSG grammars.
- General architecture for processing scope preferences
- Derivation of scope preferences from a corpus.
- Specification of Topological Dependency Grammar and development of parsers based on finite set and selection constraints.
- Encoding of TAG generation as TDG parsing.

**Plan for CHORUS 4:** A central line of research in the first three phases has been in solving configuration problems, such as dominance constraint solving and TDG parsing. In the fourth phase, we want to apply our expertise in solving such problems to new applications. Three problems that can be seen in these terms, and whose processing could benefit from our work, are the interaction of attachment and scope, TAG parsing, and statistically driven generation.

We want to develop a domain-independent framework for solving configuration problems with preferences. On the processing side, we want to investigate improved constraint technologies to process such problems, and identify useful fragments that can be solved more efficiently.

Based on this research, we want to develop a CHORUS workbench for solving configuration problems. This workbench would facilitate the development of new solvers, as well as come with modules for current dominance constraint solvers and a TDG parser as special cases.

**General perspective ("man on the moon"):** We were the first team in the world to achieve efficient, formally well-founded processing of complex semantic ambiguities. In the process, we have pioneered the application of constraint technology to computational linguistics. We are among the first to explorepreferences for scope ambiguities; by integrating them into the constraint framework, we can achieve anytime behaviour for computing preferred readings.

In the final phase, we want to apply these achievements to new areas of application.

**Cooperations within the SFB:**

- NEGRA: Cooperate on sharing architecture for TDG parsing with preferences.
- PERFORM: Preferences during parsing.
- ALPHA: Attachment preferences.

**Important external relations:** Cooperations with University of Cambridge on underspecification formalisms and syntax-semantics interfaces and with LORIA (Nancy), University of Lille, and KTH Stockholm on constraint technologies.

**Planned Resources:**
We should propose 3 Mitarbeiter and 3 Hiwi positions for the fourth phase.