Temporal Aspects of Knowledge and Information

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Outline

New TIL Project

- new GAČR project P401/10/0792, 2010–2012
- Temporal Aspects of Knowledge and Information
- 4.95 mil Kč
- staff:
  - Institute of Philosophy of the Academy of Sciences of the Czech Republic:
    - Pavel Materna
  - VŠB-Technical University of Ostrava:
    - Marie Duží, Nikola Ciprich, Tomáš Frydrych, Petr Vyletělek
  - Faculty of Informatics, Masaryk University:
    - Aleš Horák, Karel Pala, Pavel Rychlý, Vojtěch Kovář, Miloš Jakubíček
- main topic – Transparent Intensional Logic

The Main Topic

- the goal – tools and mechanisms for computer-aided natural-language analysis, knowledge management and reasoning
- NL analysis and reasoning based Transparent Intensional Logic (TIL)
- reasearch fields: *philosophical logic*, *theoretical linguistics* and *computer science*
- focused on the temporal, modal and epistemic aspects of KRR
- main problems:
  - TIL proof calculus
  - analysis of tenses and temporal logic
  - analysis of epistemic verbs and events
  - analysis of anaphora references and topic-focus articulation
- developed applications:
  - functional programming language TIL-Script
  - computer analysis of NL texts based on web ontologies like WordNet, FrameNet, VerbaLex and large corpora

Methodology and project planning

The project work will run in parallel in three cooperating and partly overlapping groups:

1. TIL theoretical backgrounds group
   - Pavel Materna, Aleš Horák, Karel Pala, Marie Duží
2. TIL logical analysis group
   - Aleš Horák, Karel Pala, Pavel Rychlý, Vojtěch Kovář, Miloš Jakubíček
3. TIL inference machine group
   - Marie Duží, Nikola Ciprich, Tomáš Frydrych, Petr Vyletělek, Martina Číhalová

Milestones	**Theoretical results**	**Applications**	
		Logical analysis	Inference
1styear (2010) Simple sentences in present, past and future tenses	– specification of TIL calculus – reference corpus of TIL constructions – type classification of basic lexicon tokens	*Computer-aided analysis* of simple sentences in past, present and future tense containing selected verbs	In the scope of FOL (enriched by explicit intensionality and temporality)
2ndyear (2011) Complex sentences in present, past and future tenses	– analysis of events – analysis of grammatical tenses – type classification of attitudes	*Computer-aided automatic analysis* of relative time-related subordinate sentences	In the scope of classical typed λ-calculus
3rdyear (2012) Context dependencies	– inference with background and common-sense knowledge – analysis of sentence context and discourse	*Computer-aided analysis* of complex sentences with temporal events including direct speech	TIL inference machine including partiality and hyperintensional features

Future Directions

Let's go for it ☺