Research interests

Päivikki Parpola
Department of computer science and engineering, Helsinki University of Technology
Hauenkalliontie 2 B 54. FIN-02170 Espoo, Finland

1 Research areas involved

- modeling the contents of information systems
- advanced integration architectures
- semantic, schematic, vocabulary, data heterogeneity
- tools for supporting information integration
- theoretical perspectives of information integration
- change management

2 Knowledge acquisition methodology

A methodology called SeSKA (Seamless Structured Knowledge Acquisition) for constructing the structure and contents of a knowledge base (KB) is under development. The development process creates a series of integrated object-oriented models following predetermined templates. Individual phases of SeSKA can be used for also other kinds of tasks than knowledge acquisition.

Domain models (DM) and dependency graphs (DG) are used as input. Heterogeneous schemes can be converted to DM and DG format [Parpola, 1999a, section 2.3].

DGs acquired from different sources can be integrated after homogenization of vocabulary according to rules based on the theory of Conceptual Graphs [Parpola, 1998, section 2.2.2].

The initial inference structure is constructed based on the combined DG [Parpola, 1998, section 3.4]. Informal, pseudo-formal and formal (executable) descriptions are attached to each inference step and developed iteratively [Parpola, 1998; 1999b]. Parallel viewing of formal and informal descriptions is useful also in change management.

Real inferences can be performed in instantiations of KBs constructed by sending messages between objects [Parpola, 1999b, section 3]. Detailed principles of applying different inference strategies (forward and backward chaining, different problem-solving methods) is being investigated.

A tool supporting SeSKA is under development.

3 Applications

The methodology is currently being applied to rock classification [Parpola, 1999a].

A KB concerning effects of diet on multiple sclerosis (MS) is intended to be built in the future based on medical research results found from Medlin (a medical database available in Internet). SeSKA is to be used in construction of this KB [Parpola, 1998, section 5].

References

[Parpola, 1998] Päivikki Parpola. Seamless development of structured knowledge bases. In *Proceedings of KAW98, Eleventh Workshop on Knowledge Acquisition, Modeling and Management. Banff, Alberta, Canada, 18th-23rd April, 1998*, 1998. http://ksi.cpsc.ucalgary.ca/KAW/KAW98/parpola/.

[Parpola, 1999a] Päivikki Parpola. Applying SeSKA to Sisyphus III. In *Proceedings of EKAW99, 11th European Workshop on Knowledge Acquisition, Modeling, and Management(EKAW '99), Dagstuhl Castle, Germany, May 26 - 29, 1999.* Springer-Verlag, 1999.

[Parpola, 1999b] Päivikki Parpola. Development and inference in integrated oo models. In *CIMCA'99 - The international conference on computational intelligence for modelling, control and automation. Vienna, 17-19 February, 1999.*, February 1999.