15. Meeting of the

IFIP WG 1.6 on Term Rewriting

June 27, 2013, Eindhoven, The Netherlands

09:00 – 09:30 Aaron Stump:
Automata-Based Parsing by Run Rewriting

09:30 – 10:00 Vincent van Oostrom (chair):
Discussion on ISR

- *Report on ISR 2014 in Valparaiso*
- *Change in ISR Bylaws*
- *Proposals for ISR 2015*

10:00 – 10:30 Coffee Break

10:30 – 11:00 Florent Jacquemard:
Unranked Tree Rewriting and Effective Closures of Languages

11:00 – 11:30 Temur Kutsia:
Unification, Matching, and Transformation of Unranked Terms

11:30 – 11:45 Georg Moser (chair):
Discussion on the Future of RTA

- *RTA and TLCA*
- *RTA at FLoC 2014*
- *Application Papers at RTA*

11:45 – 12:00 Hans Zantema (chair):
Discussion on the List of Open Problems in Rewriting
(every participant of the meeting is encouraged to bring an open problem)

12:00 – 13:00 Lunch

13:00 – 14:00 Jürgen Giesl (chair):
Business Meeting (for members of the WG only)

Aaron Stump: ***Automata-Based Parsing by Run Rewriting***

In this talk, I will present joint work in progress with Nao Hirokawa to develop a new approach to parsing based on rewriting. Reversing the arrows in the productions of a grammar trivially yields a string-rewriting system, which can easily be converted into a term-rewriting system that builds parse trees as it rewrites. But such rewriting systems usually fail to be confluent. We show how to recover confluence by changing the kind of objects the rules rewrite. Instead of rewriting strings, we rewrite runs of an automaton approximating the language of the grammar. A run is an alternating list of characters from the input string and automaton states. Grammars can be converted automatically into run-rewriting rules by an application of a theorem of Book and Otto, on applying monadic string-rewriting systems to finite automata. Confluent run-rewriting has several benefits over traditional parsing methods: ambiguities in the grammar show up as critical pairs, which can be resolved by adding new rewrite rules (instead of precedences or grammar layers); and parallel parsing now becomes very easy (unlike for traditional methods), as it is just parallel rewriting.

Florent Jacquemard: ***Unranked Tree Rewriting and Effective Closures of Languages***

We consider rewriting systems for unranked ordered trees, where the number of children of a node is not determined by its label, and is not a priori bounded. The rewriting systems are defined such that variables in the rewrite rules can be substituted by hedges (sequences of trees) instead of just trees. Consequently, this notion of rewriting subsumes both standard term rewriting and word rewriting. We consider properties of preservation for classes of unranked tree languages, including hedge automata languages and various context-free extensions. Finally, applications to static type checking for XML transformations and to the verification of read/write access control policies for XML updates will be mentioned.

Temur Kutsia: ***Unification, Matching, and Transformation of Unranked Terms***

We give a brief survey of equation solving methods for unranked terms, including unification and matching with sequence variables, and present a variant of a calculus for conditional transformations of sequences of unranked terms.