Detailed Report on the Second International Workshop on Logic Programming and Non-monotonic Reasoning (LP & NMR '93)

Jürgen Dix

1 General Remarks

When the first international workshop LP & NMR '91 was organized two years ago in Washington, there was a general feeling that *Logic Programming* on the one hand, and *Non-monotonic Reasoning* on the other hand should be brought together: their intimate relationship should be studied more deeply to gain new insights for both fields. If the idea of a series of conferences devoted to this specialized topic has ever been called in question, the very successful Second International Workshop LP & NMR '93 held in Lisbon, Portugal, June 28-30, has removed such doubts. Since Washington, many new results have been obtained and many ideas presented there turned out to be influential and became important lines of research. The workshop has grown up to a small conference: 87 participants (Wash.: 49), 25 papers + 6 invited talks (Wash.: 18 papers and 4 invited talks), 19 posters (Wash.: 4), 495 pages Proceedings (Wash.: 289).

As in Washington, all papers were divided into 6 sections of equal length. While the generic titles of the sections of the first workshop reflected the difficulty of how to integrate the new ideas and of foreseeing the future development (eg. *Properties of LP-semantics*, *Theory*, *Extensions*, *Miscellaneus*), the sections in Lisbon already show us a more mature understanding.

The first two sections (presented the first day) certainly were the most interesting ones and lead to stimulating discussions: here, the workshop-character was perfectly realized. While the second section, *MBNF and Related Topics*, has its roots in Vladimir Lifschitz' invited talk in Washington, the first section, *Implementation*, has no counterpart in LP & NMR '91, but showed that one is on the way to practical implementations. The other sections were about *Stability*, *Disjunctive LP and Inconsistency Handling*, *Nonstandard Semantics*, and *Constructive Logics*.

Before going into details, let me mention the beautiful workshop site: the Gulbenkian Foundation, a conference center in the middle of a romantic park. The social part of the meeting was even more beautiful and can hardly be exceeded: an old monastery with picturesque surroundings, a beautiful view over the sea, and an excellent concert with mediterranian renaissance (vocal) music. We all enjoyed the banquet very much.

2 Presented Papers and Invited Talks

The most influential talk of the *Implementation* section was given by Anil Nerode and based on a joint paper with C. Bell, R. Ng and V.S. Subrahmanian. They showed how to successfully use Integer-Linear-Programming methods to implement the stable semantics and also announced to follow this line of research in the next years with the goal to implement a practical system, able to solve realistic applications. The paper by M. Müller/J. Dix aims at improving this approach by using abstract properties to implement more general semantics for disjunctive logic programs based on WFS. Two more theoretical approaches were presented by R. Vingralek (a connectionist approach) and W. Drabent (an improved SLS-resolution). During the discussions of the first day, Anil Nerode compared the current situation in the field of semantics of logic programs with the situation of computability theory in the thirties, where many different concepts of computability were defined and only later it became clear that all these approaches were, more or less, equivalent. This, in some sense visionary view is justified by the many results relating semantics to various systems of modal logic. These investigations lead to the important notions of "MBNF" (Lifschitz), "Reflexive AE-Logic" (Schwarz) and are considered in the second section (*MBNF and Related Topics*) by V. Lifschitz/G. Schwarz (who both could not attend the workshop: their talk was given by W. Marek) and W. Marek/M. Truszczynski. The paper of J. Chen proves similar results for Levesque's *All I know*-logic.

Another version of AE logic is considered by P. Bonatti. The invited talk of this section was delivered by Raymond Reiter: *On Reasoning about Actions*.

The section *Stability* dealt mainly with the stable semantics and was introduced by Robert Kowalski's invited talk (joint paper with A. Bondarenko and F. Toni) on relating abduction and STABLE: *An Assumption-based Framework for Non-monotonic Reasoning.* Particular properties of STABLE were described in the papers of S. Costantini and F. Teusink. Extensions of STABLE by using Geffner's causal theories (A. Torres) and bilattices (B. Mobasher et al.) were also presented.

The third section, *Disjunctive LP and Inconsistency Handling*, began with an excellent and superbly presented invited talk on *Recent Complexity Results in Logic Programming and Non-monotonic Reasoning and Why They Matter* by Georg Gottlob. The papers of C. Sakama/K. Inoue and A. Mikitiuk/M. Truszczynski related default logic to disjunctive LP. Inconsistency handling was considered by G. Wagner and L. Pereira/C. Damasio/J. Alferes.

Yehosua Sagiv opened the section *Nonstandard Semantics* with an invited talk on the various techniques of how to efficiently evaluate queries in deductive databases: *Tools for Deductive Databases*. Two unifying frameworks for semantics were presented: one by J. Alferes/P. Dung/L. Pereira to study the various forms of explicit negation, and the other by M. Denecker/D. de Schreye to study completion-, stable- and wellfounded semantics. Two extensions of known semantics were also given: G. Brewka used abduction to improve the stable semantics, while P. Geerts/D. Vermeir incorporated the implicit specificity information in a new formalism. M. Gelfond/H. Przymusinska considered the problem of reasoning in the absence of the domain-closure axiom.

The last section finally contained four approaches to describe Negation-as-Failure by certain constructive logics. While L. McCarty/R. van der Meyden and F. Dong/L. Lakshmanan used intuitionistic logics, D. Pearce applied Nelson's logic N, and D. Busch defined an intuitionistic fragment of a non-monotonic three-valued logic of Sandewall. The invited speaker for this section, Wolf Kohn, was not able to attend the conference. His talk was given by the coauthor of the paper, A. Nerode: *Autonomous Control of Hybrid Systems With Declarative Controllers*.

3 Conclusion and Criticism

First of all congratulations to Luis Pereira and his group for the organization and the friendly atmosphere during the workshop: they all have done an excellent job. But, of course, there can always be found some grain of salt (or two). My following four remarks might therefore be of some use for the organizers of the next conference in Lexington, Kentucky 1995.

1. The idea of presenting the posters parallel to the regular talks proved to be completely impracticable. Indeed, only a very small percentage of the posters were delivered and an even smaller audience attended them. A separate rump-session, not in competition with the regular talks (like in Washington), would be a better idea.

2. I appreciated very much Jack Minker's banquet address in Washington and missed a comparable talk (A. Nerode certainly would be a good candidate).

3. I also appreciated the Panel-Discussion in Washington which had no counterpart in Lisbon. The reason is perhaps that there was not enough time due to the greater number of papers.

4. I strongly argue in favour of a real workshop with an intimate atmosphere and with enough time to meet and talk to people. If the next workshop grows as much as the previous one, this can certainly not be fulfilled.

A last remark and warning to all visitors: Lisbon is a very charming city with its own flair. But take care of your money and papers, especially during the rush-hour in the metro. The pickpockets are really artists: I gained experience!