Logic Programming and the INTERNET

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Computational logic systems can offer an attractive environment for developing Internet applications. They share many of the important characteristics of popular network programming tools, including dynamic memory management, well-behaved structure and pointer manipulation, robustness, and compilation to architecture-independent bytecode. However, in addition, computational logic systems offer some unique features such as very powerful symbolic processing capabilities, constraint solving, dynamic databases, search facilities, grammars, sophisticated meta-programming, and well understood semantics. Such features can often make it very easy to code simple applications.

This special issue concerned with applications is the third of its kind in a journal sponsored by the Association for Logic Programming. The first appeared in 1990, and showed the potential for logic programming to be extended. The second issue highlighted some papers from the Practical Applications of Prolog conference that had been held. This third time, the applications are concerned with the Internet and reflect the profound impact that the Internet has had on the computing landscape. The Call for Papers for this special issue included the following statements:

The paradigm shift to highly interconnected computers and distributed programming tools has attracted attention to the fact that (constraint) logic programming languages may offer a unique opportunity to contribute to practical Internet application development. Simplicity, remote executability, robustness, and automatic memory management, are among the features some LP languages share with emerging tools like Java. Superior meta-programming and high-level distributed programming facilities, built-in grammars and dynamic databases, and declarative semantics are among their competitive advantages. This special issue invites papers which explore new insights on emerging net technologies provided by logic and constraint logic programming, as well as novel aspects of the use of these programming paradigms and their associated tools for developing practical Internet applications.

Five papers were selected for the special issue. The first paper, 'Multi-Threading and Message Communication in Qu-Prolog' by Keith Clark, Peter Robinson and

Richard Hagen, presents how Internet communication has been added to the Qu-Prolog dialect for supporting theorem proving. It draws on experience with earlier languages, Erlang and April. It presents some excellent examples concerned with Linda client support and a query server. The second paper, 'The Munich Rent Advisor: Implementing a Success for Logic Programming' by Thom Frühwirth and Slim Abdennadher, is about an Internet application of constraint logic programming, replicating the role of the German Mietspiegel, a calculation of the fair rent for flats in Munich. The paper describes one of the first Internet applications for logic programming of which we are aware. The third paper, 'WWW Programming using Logic Programming Systems and the CIAO PiLLoW Library' by Daniel Cabeza and Manuel Hermenegildo, describes the Pillow library allowing easily handling of Web pages. The library has been used by many researchers to build Internet applications. Here is the first time the library has been described in a journal. The fourth paper, 'Secure Prolog-based mobile code' by Seng Wai Loke and Andrew Davison, draws from the LogicWeb system that the authors designed and implemented. They show how a meta-programming approach leads to a programmable and potentially verifiable security policy for mobile code written in LogicWeb. The final paper, 'High level networking with mobile code and first order AND-continuations' by Paul Tarau and Veronica Dahl, presents a framework for mobile agents based on logic programming. The paper covers a range of interesting topics on mobility of Prolog code over networks. It shows their synergy with multi-threading and blackboards as building blocks of an agent-based Internet Programming infrastructure.

There have been substantial delays since the papers were submitted. In Internet time, rapid changes can happen. We are pleased that these papers survive the test of time.

It is a special honour to be associated with the new journal for logic programming, *Theory and Practice of Logic Programming*. It was a courageous step for the editors to protest the high prices of the previous logic programming journal published in cooperation with the Association of Logic Programming. Their action has already received widespread support and recognition. We look forward to successful reporting of many more computational logic applications.