The Universities of York and Leeds present the

# Eighth Knowledge Representation and Reasoning Distinguished Lecturer

# Frank van Harmelen

Professor van Harmelen will deliver two talks, both aimed at a general audience of computer scientists. The public is invited to attend these talks and the receptions afterwards.

## The Semantic Web

### How the Web can Exploit Knowledge Representation

14:00, Tuesday, 21 January 2003
Active Learning Lab (Room 9.30a)
EC Stoner Building
School of Computing
University of Leeds

Despite its huge success, the World Wide Web is suffering from a major limitation: processing information on the Web has been the privilege of agents that can understand full natural language and graphics, i.e. humans only. The role of computers on the Web is so far limited to the transport and display of information, and they give us almost no support in dealing with the content of the information. The aim of the "semantic web" is to make at least some of the meaning of information on the Web accessible to machines, enabling them to give us much more support in finding, combining and deriving information than what is possible now.

This talk outlines the main ingredients that are necessary to realise this grand vision of a semantic web. I report on what has been achieved so far, what is likely to be achieved in the near future, and what are the remaining hard challenges for researchers in artificial intelligence and computer science alike.

## Robust Knowledge Representation

### Better Half an Answer in Time Than a Full Answer Too Late

14:00, Wednesday 22 January 2003
Haycock Lecture Theatre (Room CS/103)
Department of Computer Science
University of York

The logical roots of knowledge representation (KR) have given the field much of its strength: well formalised foundations with well understood properties. However, the logical roots are also responsible for some of the major weaknesses in KR. Deduction procedures are typically crisp (answers are either yes or no, with no intermediate values), abrupt (answers are available only at the end of the procedure) and inefficient (computation time cannot be traded against the quality of the answer). These unfortunate properties severely limit the applicability of KR, and also do not make a plausible model of realistic reasoning strategies.

This talk presents some of our results towards *robust* forms of KR which, although still firmly rooted in logic, display anytime behaviour: algorithms can be interrupted at any time during their computation, and will provide an approximation of the final answer. We give both theoretical characterisations of such algorithms, as well as practical results obtained in diagnosis and classification.

**About the Speaker:** After studying mathematics and computer science in Amsterdam, Frank van Harmelen moved to the Department of AI in Edinburgh. There he worked on both Socrates, a logic-based toolkit for expert systems, and on proof planning for inductive theorem proving. He was awarded a PhD in 1989 for his research on meta-level reasoning. He moved back to Amsterdam in 1990 where he worked on the use of reflection in expert systems, and on the development of the $(ML)^2$ language for formally specifying knowledge-based systems. In 1995 he joined the AI Department at the Vrije Universiteit Amsterdam, where he holds the chair in Knowledge Representation and Reasoning.

His current interests include approximate reasoning, the semantic web, and medical protocols. He is also active in the World Wide Web consortium, contributing to the standardisation of OWL, the ontology representation language for the semantic web. His research results have been reported in over 100 research papers and in three books (on meta-level inference, on logic in knowledge-based systems and on the semantic web).

**About the Lecture Series:** This lecture series is sponsored and organised by the Department of Computer Science at the University of York and the School of Computing at the University of Leeds. Its purpose is to promote the strong research interests that both departments have in knowledge representation and reasoning. Further information can be found at http://www.cs.york.ac.uk/aig/seminars/dist.html.

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