IFIP - The International Federation for Information Processing

IFIP was founded in 1960 under the auspices of UNESCO, following the First World Computer Congress held in Paris the previous year. An umbrella organization for societies working in information processing, IFIP's aim is two-fold: to support information processing within its member countries and to encourage technology transfer to developing nations. As its mission statement clearly states,

IFIP's mission is to be the leading, truly international, apolitical organization which encourages and assists in the development, exploitation and application of information technology for the benefit of all people.

IFIP is a non-profitmaking organization, run almost solely by 2500 volunteers. It operates through a number of technical committees, which organize events and publications. IFIP's events range from an international congress to local seminars, but the most important are:

- The IFIP World Computer Congress, held every second year;
- open conferences;
- working conferences.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is small and by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is less rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

Any national society whose primary activity is in information may apply to become a full member of IFIP, although full membership is restricted to one society per country. Full members are entitled to vote at the annual General Assembly, National societies preferring a less committed involvement may apply for associate or corresponding membership. Associate members enjoy the same benefits as full members, but without voting rights. Corresponding members are not represented in IFIP bodies. Affiliated membership is open to non-national societies, and individual and honorary membership schemes are also offered.
INTELLIGENT
INFORMATION
PROCESSING

IFIP 17th World Computer Congress —
TC12 Stream on Intelligent Information Processing
August 25-30, 2002, Montréal, Québec, Canada

Edited by

Mark Musen
Stanford Medical Informatics
Stanford University
USA

Bernd Neumann
FB Informatik
Hamburg University
Germany

Rudi Studer
Institute AIFB
University of Karlsruhe
Germany

KLUWER ACADEMIC PUBLISHERS
BOSTON / DORDRECHT / LONDON
The original version of the book frontmatter was revised: The copyright line was incorrect. The Erratum to the book frontmatter is available at DOI: 10.1007/978-0-387-35602-0_35
Contents

Foreword ................................................................. xi
Conference and Program Committees .............................. xiii

Invited Presentations

Being Smart In Information Processing
H. Akkermans ................................................................. 1

Multimodal Representations as Basis for Cognitive Architecture
B. Chandrasekaran ........................................................... 13

Agent-Based Computing
N. R. Jennings ................................................................. 17

Architectures and Solutions for the Knowledge Web
E. Motta ........................................................................... 31

Semantic Web and Peer-to-Peer Technologies for Distributed Learning Repositories
W. Nejdl ................................................................. 33

Paper Sessions

Ontology Management

Managing Multiple Ontologies and Ontology Evolution in Ontologging
A. Maedche, B. Motik, L. Stojanovic, R. Studer and R. Volz 51
IKAT: A Tool for Incremental Development of Ontologies through Versions
M. Larrañaga and J. A. Elorriaga ....................................................65

A Template-Based Approach Toward Acquisition of Logical Sentences
C.J. Hou, N. F. Noy and M. A. Musen ..................................................77

Semantic Web Architecture
Configuring Online Problem-Solving Resources with the Internet Reasoning Service
M. Crubézy, W. Lu, E. Motta and M. A. Musen ........................................91

Semantic Web and Multi-Agents Approach to Corporate Memory Management
F. Gandon, R. Dieng-Kuntz, O. Corby and A. Giboin ..............................103

Mobile Constraints for Semantic Web Applications
P.Gray, K. Hui and A. Preece .....................................................................117

Knowledge-engineering Frameworks
A Knowledge Based Framework for The Design of Soft-Computing Systems
S. Ramachandran, M. Erraguntla and P. Benjamin ....................................129

A Reverse Engineering Approach for Migrating Data-intensive Web Sites to the Semantic Web
N. Stojanovic, L. Stojanovic and R. Volz .................................................141

Systematic Generation of Bayesian Networks from Systems Specifications
M. Borth and H. von Hasseln ......................................................................155

Knowledge-system Structure
Dynamic Choice of Agent Interaction Protocols
J.-L. Koning ..............................................................................................167

An Algebraic Characterization of Equivalent Bayesian Networks
S. K. M. Wong and D. Wu .............................................................................177
Estimating Knowledge Decay
J. Debenham .......................................................... 189

Data Mining
An Information-Theoretic Approach to the Pre-pruning of Classification Rules
M. Bramer .......................................................... 201

A User-Centered Visual Approach to Data Mining:
The System D2MS

ONTOCOPI: Methods and Tools for Identifying Communities of Practice
H. Alani, K. O'Hara and N. Shadbolt ................................................ 225

Implementing Problem Solvers
The JESSTAB Approach to Protége and JESS Integration
H. Eriksson .......................................................... 237

Implementing Constraint Solvers in B-Prolog
N. Zhou.............................................................. 249

Poster Session
Application of Uncertain Variables to Decision Making in a Class of Distributed Computer Systems
Z. Bubnicki .......................................................... 261

Learning Fuzzy Decision Trees from Sequential and Incomplete Data
G. Chen, R. Lu, Z. Jin ................................................ 265

Harnessing the Internet into a Knowledge Framework
R. Longworth .......................................................... 269

Analogy Supports for Software Reuse and Knowledge Management

Knowledge Management Support for Cooperative Research
J. Ma and M. Hemmje ................................................. 281
An Extended Possibility-Based Fuzzy Nested Relational Database Model and Algebra  
Z. M. Ma and F. Mili .................................................................285

Real-Time Meeting Scheduling Model by Computer Supported Cooperative Work  
G. Martinovic and L. Budin ......................................................289

The NED IIS Project - Forest Ecosystem Management  

Elaboration and Exploitation of Lessons Learned  
H. Rakoto, P. Clermont and L. Généste ......................................297

A Hybrid Expert System Supporting Diagnosis of Heart Diseases  
A.-B. M. Salem and R. A. HodHod ..................................................301

IDSIS: Intelligent Document Semantic Indexing System  

An Application of Assembly Structure in Welding Estimate of Welding Object in Manufacturing Design  
Z. Zhang, I. Nagasawa , M. Mochizuki, H. Yamaguchi and M. Umeda.....311

Erratum to: Intelligent Information Processing  
M. Musen, B. Neumann and R.Studer...........................................E1

Author Index ..................................................................................315
Foreword

The papers in this volume represent the program for the Conference on Intelligent Information Processing (IIP 2002) held in conjunction with the 17th World Computer Congress of the International Federation of Information Processing (IFIP), which convened in Montreal, Canada, August 26–29, 2002. The conference represents a major activity of IFIP Working Group 12.5, dedicated to "knowledge-oriented development of applications," of Technical Committee 12, on Artificial Intelligence. Working group 12.5 brings together an international community of scientists concerned with the use of knowledge-based techniques in the engineering of real-world software systems.

IIP 2002 emphasized discussions of knowledge-based system architectures and intelligent information management. Invited talks and panels highlighted important new topics, such as the use of ontologies to support knowledge-based applications, the emergence of knowledge-based techniques on the Web, agent-oriented architectures, and fundamental questions of knowledge representation.

The majority of the conference was devoted to presentation of the scientific results contained in this volume. Through oral presentations, panels and poster sessions, attendees discussed varied dimensions of intelligent information processing. All papers were refereed by at least two reviewers. Of the 44 manuscripts submitted to the conference, the program committee was able to accept 17 full papers and 12 posters. Two keynote presentations and five invited surveys constituted an important part of the conference:

- H. Akkermans (The Netherlands): Being Smart in Information Processing: Technological and Social Challenges and Opportunities
- B. Chandrasekaran (USA): Multimodal Representations as Basis for Cognitive Architecture
- N. Jennings (UK): Agent-Based Computing
- J. Hendler (USA): The Semantic Web
• E. Motta (UK): Architectures and Solutions for the Knowledge Web
• W. Nejdl (Germany): Semantic Web and Peer-to-Peer Technologies for Distributed Learning Repositories
• W. Wahlster (Germany): Personalized Web Interaction

IIP 2002 would not have been possible without the hard work of the scientific program committee. The program co-chairs are also grateful to Nenad Stojanovic and Eva Elliott for their expert assistance in handling manuscripts and assembling these proceedings.

We hope that you will find these proceedings a valuable collection of some of the most stimulating work taking place internationally in the area of intelligent information processing. The emergence of novel architectures for intelligent systems, the advent of the Semantic Web, and the maturation and widespread dissemination of techniques for the construction of intelligent systems make these exciting times for the knowledge-oriented development of software applications. These proceedings serve as a written record of the contributions made by the participants of IIP 2002 and of the promising new results of research in applied artificial intelligence.

Mark A. Musen, Stanford
Bernd Neumann, Hamburg
Rudi Studer, Karlsruhe
Conference and Program Committees

Conference Chair:
Bernd Neumann, University of Hamburg, Germany

Program Co-Chairs:
Mark Musen, Stanford University, USA
Rudi Studer, University of Karlsruhe, Germany

Program Committee:
Hans Akkermans (The Netherlands)             Wolfgang Klas (Austria)
Salem Abdelbadeeh (Egypt)                    Deborah McGuiness (USA)
Richard Benjamins (Spain)                    Robert Meersman (Belgium)
B. Chandrasekaran (USA)                      Tim Menzies (Canada)
Paul Compton (Australia)                     Riichiro Mizoguchi (Japan)
Monica Crubezy (USA)                         Pavol Navrat (Slovakia)
John Debenham (Australia)                    Wolfgang Nejdl (Germany)
Yves Demazeau (France)                       Erich Neuhold (Germany)
Rose Dieng-Kuntz (France)                    Natalya Fridman Noy (USA)
Henrik Eriksson (Sweden)   Dan O'Leary (USA)
Boi Faltings (Switzerland)  Enric Plaza (Spain)
Adam Farquhar (USA)        Alun Preece (UK)
Dieter Fensel (The Netherlands)  Ulrich Reimer (Switzerland)
John Gennari (USA)         M. Sasikumar (India)
Yolanda Gil (USA)          Guus Schreiber (The Netherlands)
Asun Gomez-Perez (Spain)   Ana Garcia Serrano (Spain)
Nicola Guarino (Italy)     Nigel Shadbolt (UK)
Lynda Hardmann (The Netherlands)  Yuval Shahar (Israel)
Masahiro Hori (Japan)      Stuart C. Shapiro (USA)
Werner Horn (Austria)      Derek Sleeman (UK)
Ian Horrocks (UK)          Steffen Staab (Germany)
Nik Kasabov (New Zealand)  Gerd Stumme (Germany)
Larry Kerschberg (USA)     Samson Tu (USA)