

# Preface

This volume contains papers selected for presentation at PKDD'99, the Third European Conference on Principles and Practice of Knowledge Discovery in Databases. The first meeting was held in Trondheim, Norway, in June 1997, the second in Nantes, France, in September 1998.

PKDD'99 was organized in Prague, Czech Republic, on September 15-18, 1999. The conference was hosted by the Laboratory of Intelligent Systems at the University of Economics, Prague. We wish to express our thanks to the sponsors of the Conference, the Komerční banka, a.s. and the University of Economics, Prague, for their generous support.

Knowledge discovery in databases (KDD), also known as data mining, provides tools for turning large databases into knowledge that can be used in practice. KDD has been able to grow very rapidly since its emergence a decade ago, by drawing its techniques and data mining experiences from a combination of many existing research areas: databases, statistics, mathematical logic, machine learning, automated scientific discovery, inductive logic programming, artificial intelligence, visualization, decision science, and high performance computing. The strength of KDD came initially from the value added to the creative combination of techniques from the contributing areas. In order to establish its identity, KDD has to create its own theoretical principles and to demonstrate how they stimulate KDD research, facilitate communication and guide practitioners towards successful applications.

Seeking the principles that can guide and strengthen practical applications has been always a part of the European research tradition. Thus "Principles and Practice of KDD" (PKDD) make a suitable focus for annual meetings of the KDD community in Europe. The main long-term interest is in theoretical principles for the emerging discipline of KDD and in practical applications that demonstrate utility of those principles. Other goals of the PKDD series are to provide a European-based forum for interaction among all theoreticians and practitioners interested in data mining and knowledge discovery as well as to foster interdisciplinary collaboration.

A Discovery Challenge hosted at PKDD'99 is a new initiative promoting cooperative research on new real-world databases, supporting a broad and unified view of knowledge and methods of discovery, and emphasizing business problems that require an open-minded search for knowledge in data. Two multi-relational databases, in banking and in medicine, were widely available. The Challenge was born out of the conviction that knowledge discovery in real-world databases requires an open-minded discovery process rather than application of one or another tool limited to one form of knowledge. A discoverer should consider a broad scope of techniques that can reach many forms of knowledge. The discovery process cannot be rigid and selection of techniques must be driven by knowledge hidden in the data, so that the most and the best of knowledge can be reached.

The contributed papers were selected from 106 full papers (45% growth over PKDD'98) by the following program committee:

**Pieter Adriaans** (Syllogic, Netherlands), **Petr Berka** (U. Economics, Czech Rep.), **Pavel Brazdil** (U. Porto, Portugal), **Henri Briand** (U. Nantes, France), **Leo Carbonara** (British Telecom, UK), **David L. Dowe** (Monash U., Australia), **A. Fazel Famili** (IIT-NRC, Canada), **Ronen Feldman** (Bar Ilan U., Israel), **Alex Freitas** (PUC-PR, Brazil), **Patrick Gallinari** (U. Paris 6, France), **Jean Gabriel Ganascia** (U. Paris 6, France), **Attilio Giordana** (U. Torino, Italy), **Petr Hájek** (Acad. Science, Czech Rep.), **Howard Hamilton** (U. Regina, Canada), **David Hand** (Open U., UK), **Bob Henery** (U. Strathclyde, UK), **Mikhail Kiselev** (Megaputer Intelligence, Russia), **Willi Kloesgen** (GMD, Germany), **Yves Kodratoff** (U. Paris 11, France), **Jan Komorowski** (Norwegian U. Sci. & Tech.), **Jacek Koronacki** (Acad. Science, Poland), **Nada Lavrac** (Josef Stefan Inst., Slovenia), **Heikki Manilla** (Microsoft Research, Finland), **Gholamreza Nakhaeizadeh** (DaimlerChrysler, Germany), **Gregory Piatetsky-Shapiro** (Knowledge Stream, Boston, USA), **Jaroslav Pokorný** (Charles U., Czech Rep.), **Lech Polkowski** (U. Warsaw, Poland), **Mohamed Quafafou** (U. Nantes, France), **Jan Rauch** (U. Economics, Czech Rep.), **Zbigniew Ras** (UNC Charlotte, USA), **Wei-Min Shen** (USC, USA), **Arno Siebes** (CWI, Netherlands), **Andrzej Skowron** (U. Warsaw, Poland), **Derek Sleeman** (U. Aberdeen, UK), **Nicolas Spyrtos** (U. Paris 11, France), **Olga Štěpánková** (Czech Tech. U.), **Shusaku Tsumoto** (Tokyo U., Japan), **Raul Valdes-Perez** (CMU, USA), **Rudiger Wirth** (DaimlerChrysler, Germany), **Stefan Wrobel** (GMD, Germany), **Ning Zhong** (Yamaguchi U., Japan), **Wojtek Ziarko** (U. Regina, Canada), **Djamel A. Zighed** (U. Lyon 2, France), **Jan Żytkow** (UNC Charlotte, USA).

The following colleagues also reviewed for the conference and are due our special thanks: Thomas Ágotnes, Mirian Halfeld Ferrari Alves, Joao Gama, A. Giacometti, Claire Green, Alipio Jorge, P. Kuntz, Dominique Laurent, Terje Løken, Aleksander Øhrn, Tobias Scheffer, Luis Torgo, and Simon White.

Classified according to the first author's nationality, papers submitted to PKDD'99 came from 31 countries on 5 continents (Europe: 71 papers; Asia: 15; North America: 12; Australia: 5; and South America: 3), including Australia (5 papers), Austria (2), Belgium (3), Brazil (3), Bulgaria (1), Canada (2), Czech Republic (4), Finland (3), France (10), Germany (12), Greece (1), Israel (3), Italy (6), Japan (8), Korea (1), Lithuania (1), Mexico (1), Netherlands (3), Norway (2), Poland (4), Portugal (2), Russia (3), Slovak Republic (1), Slovenia (1), Spain (1), Switzerland (1), Taiwan (1), Thailand (2), Turkey (1), United Kingdom (9), and USA (9). Further authors represent: Australia (6 authors), Austria (1), Belgium (5), Brazil (5), Canada (4), Colombia (2), Czech Republic (3), Finland (2), France (12), Germany (9), Greece (1), Israel (13), Italy (9), Japan (15), Korea (1), Mexico (1), Netherlands (3), Norway (3), Poland (4), Portugal (4), Russia (1), Slovenia (3), Spain (4), Switzerland (1), Taiwan (1), Thailand (1), Turkey (1), Ukraine (1), United Kingdom(9), and USA (9).

Many thanks to all who submitted papers for review and for publication in the proceedings. The accepted papers were divided into two categories: 28 oral presentations and 48 poster presentations. In addition to poster sessions each poster paper has been allocated 3-minute highlight presentation at a plenary session.

Invited speakers included Rudiger Wirth (DaimlerChrysler, Germany) and Wolfgang Lehner (IBM Almaden Research Center, USA).

Six tutorials were offered to all Conference participants on 15 September: (1) Data Mining for Robust Business Intelligence Solutions by Jan Mrazek; (2) Query Languages for Knowledge Discovery Processes by Jean-François Boulicaut; (3) The ESPRIT Project CreditMine and its Relevance for the Internet Market by Michael Krieger and Susanne Köhler; (4) Logics and Statistics for Association Rules and Beyond by Petr Hájek and Jan Rauch; (5) Data Mining for the Web by Myra Spiliopolou; and (6) Relational Learning and Inductive Logic Programming Made Easy by Luc De Raedt and Hendrik Blockeel.

Members of the PKDD'99 organizing committee have done an enormous amount of work and deserve the special gratitude of all participants: **Petr Berka** – Discovery Challenge Chair, **Leonardo Carbonara** – Industrial Program Chair, **Jiří Ivánek** – Local Arrangement Chair, **Vojtěch Svátek** – Publicity Chair, and **Jiří Kosek**, **Marta Sochorová**, and **Dalibor Šrámek**. Special gratitude is also due **Milena Zeithamlová** and **Lucie Váchová**, and their organizing agency, **Action M Agency**.

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Jan Rauch and Jan Žytkow  
PKDD'99 Program Co-Chairs