

Prof. Dr. Johannes Fürnkranz  
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## Curriculum Vitae

### Johannes Fürnkranz

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#### Vita

**Prof. Johannes Fürnkranz** obtained Master Degrees from the Technical University of Vienna and the University of Chicago, and a Ph.D. from the Technical University of Vienna with a Thesis on *Pruning Algorithms for Rule Learning*. Most of his thesis work was conducted at the Austrian Research Institute for Artificial Intelligence, with which he was affiliated from 1992 to 2002. In 1997, he received a Erwin Schrödinger-Stipendium of the Austrian *Fonds zur Förderung der wissenschaftlichen Forschung*, which allowed him to spend a post-doc year at Tom Mitchell's research group at Carnegie Mellon University. In 2001 he received his habilitation in Artificial Intelligence and in 2002, he received a prestigious APART stipend of the Austrian Academy of Sciences. Since January 2004, he is Professor for Knowledge Engineering at the TU Darmstadt.

His main research interest is machine learning, in particular inductive rule learning and preference learning, and their applications in game playing, web mining, and data mining in the Social Sciences. He has published more than 70 scientific articles in these areas. He is action editor for two of the leading journals in this field, *Machine Learning* and *Data Mining and Knowledge Discovery*, and current or past Editorial Board Member of several other renown journals. He is a regular member of program committees of premier conferences in the areas of machine learning, data mining, information retrieval, and artificial intelligence, and was nominated "best reviewer" at two Machine Learning conferences. He also received an "Outstanding Editor Award" of the Machine Learning journal. In 2006, he was co-chairing the *6th European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases* in Berlin, the largest international joint conference in these areas. He currently serves as the proposals chair (responsible for the selection of upcoming conference venues) for the steering committee of this conference series. Most recently he has been appointed program co-chair of the *27th International Conference on Machine Learning* to be held in Haifa, the most renown and traditional conference in this research area.

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#### Education

- 1972–1976 • Primary School, Laa/Thaya, Austria
- 1976–1984 • High School (*Gymnasium*), BG+BRG Laa/Thaya, Austria
  - ▷ 13. 06. 1984: Matura, passed with honors
- 1984–1991 • Study of *Computer Science* (Informatik) and *Technical Mathematics* (Technische Mathematik) at the *Vienna University of Technology*, Wien, Austria
  - ▷ 29. 01. 1987: 1. Diplomprüfung Technical Mathematics
  - ▷ 23. 10. 1989: 1. Diplomprüfung Computer Science
  - ▷ 17. 06. 1991: 2. Diplomprüfung Computer Science
  - ▷ Diploma Thesis on "Induktives Lernen durch Generieren von Decision Trees", in co-operation with the *International Institute for Applied Systems Analysis*. Supervisors: Lothar Winkelbauer (IIASA), Wolfgang Nejdl, Georg Gottlob
  - ▷ 27. 06. 1991: Sponsion, Academic Degree *Diplom-Ingenieur*

## Education (continued)

- 1991–1992 • Study of *Artificial Intelligence* at the *University of Chicago*, USA  
Advisor: Kris Hammond  
▷ 28. 08. 1992: Convocation, Academic Degree *Master of Science*
- 1992–1994 • Doctoral Studies at the *Vienna University of Technology*, in collaboration with the *Department of Medical Cybernetics and Artificial Intelligence*, *University of Vienna*.  
Advisor: Gerhard Widmer, Committee: Robert Trappl, Igor Mozetič  
▷ Ph. D. Thesis on “Efficient Pruning Methods for Relational Learning”  
▷ 11. 11. 1994: Thesis Defence, passed with honors  
▷ 16. 12. 1994: Promotion, Academic Degree *Doctor Technicae*
- 1997–1998 • Post-Doctoral year at *Carnegie-Mellon University*, Pittsburgh, USA  
Supervisor: Tom Mitchell
- 2001 • Habilitation at the *Faculty of Science and Informatics* of the *Vienna University of Technology*, *venia legendi* for “Artificial Intelligence”  
▷ Habilitation Thesis on “Inductive Rule Learning for Data and Web Mining”  
▷ 23. 11. 2001: Habilitation Colloquium
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## Employment

- 1987–1989 • Summer Jobs at *IBM Austria*, Wien  
▷ Porting of an application from MVS/AS to VM/AS and SQL/DS  
▷ AS Development for OMV (Austrian oil and gas company)  
▷ AS Training of other interns
- 1990–1991 • Associated Research Assistant at the *International Institute for Applied Systems Analysis (IIASA)*, Laxenburg, Austria  
▷ implementation of a decision-tree learning algorithm as part of Master’s thesis
- 1991–1992 • Research Assistant at the *University Chicago’s Artificial Intelligence Laboratory*  
▷ mostly course-work with an emphasis on intelligent agents, case-based reasoning, and intelligent information retrieval
- 1992–2002 • Researcher at the *Austrian Research Institute for Artificial Intelligence*, Wien  
▷ various basic and applied machine learning research projects both national and EC-wide (see below)
- 1995 • Zivildienst (civilian service, alternative to mandatory military service)  
▷ driving and scheduling ambulances (*Arbeitersamariterbund* Purkersdorf)
- 1997–1998 • Visiting Scientist at *Carnegie Mellon University’s Center for Automated Learning and Discovery*  
▷ working in Tom Mitchell’s text learning group
- 2002–2003 • APART Stipend from the *Austrian Academy of Sciences*.  
▷ working on “Fundamentals of Rule Learning”.
- 2004– • Professor (C3) for Knowledge Engineering at the TU Darmstadt
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## Projects

### *Supervision*

- 1997–1998 • Intelligent Data Analysis for Information Retrieval on the World-Wide Web (Erwin Schrödinger Stipendium, Austrian Science Fund (FWF))
- 2002–2003 • Fundamentals of Rule Learning (Apart Stipendium, Austrian Academy of Sciences)

## Projects (continued)

- 2006–2008 • ALIS—Automated Legal Intelligent System (EC IST, 6th Framework, TUD share: 300 k€)
- 2006–2010 • GloCSyn: Towards A Synthesis of Local and Global Pattern Discovery (DFG project, ca. 400 k€)
- 2007–2009 • Learning by Pairwise Comparison for Problems with Structured Output Spaces (DFG project, TUD share ca. 100 k€)
- 2009 • Multilabel Classification Methods for Problems with Large Number of Labels (DAAD/IKYDA travel support, TUD share ca. 5k€)

### *Participation*

- 1991–1992 • ALEX: Automatic Learning Environment for Expert Systems (national project at IIASA)
- 1992–1994 • Machine Learning and Qualitative Models (national FWF project)  
• Investigation of the Potential Contribution of AI-Methods to the Avoidance of Crises and Wars (national project for the Austrian Federal Ministry for Science, Research, and the Arts)
- 1996–1997 • Knowledge Discovery in Databases via Inductive Logic Programming (national FWF project)  
• Intelligent Data Analysis in Steel Casting (industrial project)
- 1998–1999 • InQuaC: Innovative Quality Control Methods for Rotating Machines Using Artificial Intelligence Methods (EC Brite-Euram III RTD project)  
• NAMEisBOND - Weight Preference Profiling (national FFF project)
- 1999–2002 • A New Modular Architecture for Data Mining (national FWF project)  
• MetaL: A Meta-Learning Assistant for Providing User Support in Machine Learning and Data Mining (EC ESPRIT project)  
• 3DSearch: 3D Ontology-based Web Search Application (EC IST trial project)

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## Lectures

### *Courses Taught*

- TUD
  - TU Darmstadt, Germany
    - ▷ Introduction to General Computer Science 1 (WS0405,WS0607,WS0809)
    - ▷ Introduction to General Computer Science 2 (SS05,SS07,SS09)
    - ▷ Introduction to Artificial Intelligence (SS07,SS09)
    - ▷ Introduction to Data and Knowledge Engineering (jointly with A. Buchmann; SS05,SS06,SS07,SS08,SS09)
    - ▷ Introduction to Machine Learning and Data Mining (jointly with G. Grieser; WS0304,WS0405,WS0506,WS0607)
    - ▷ Machine Learning: Symbolic Approaches (WS0809)
    - ▷ Web Mining (SS04,SS05,SS06,SS08)
    - ▷ Seminar Machine Learning and Data Mining in Practice (jointly with B. Schiele and Th. Hofmann, WS0405)
    - ▷ Seminar on Machine Learning Research (WS0405,WS0506,WS0607)
    - ▷ Seminar Knowledge Engineering and Learning in Games (SS04,SS06)
    - ▷ Seminar on Spam Mail Filtering (SS05)
    - ▷ Practical Course in Machine Learning (SS04,SS05,SS06,SS07)
    - ▷ Computer Poker Challenge (SS08,SS09)
- MPI
  - International Max Planck Research School for Demography, Rostock, Germany
    - ▷ Agent-Based Computational Demography (jointly with Francesco C. Billari; Jan 02)
- IMKAI
  - University of Vienna (Dept. of Medical Cybernetics and Artificial Intelligence)

## Lectures (continued)

- ▷ Web Mining — Data Mining im Internet (SS01,SS02)
- ▷ Inductive Logic Programming (SS96,SS97,SS99)
- ▷ Machine Learning (jointly with Gerhard Widmer; WS97)
- TU Wien Vienna University of Technology
  - ▷ Teaching Assistant for various undergraduate courses in Computer Science and Mathematics (1986–1991)
- *Lectures in Industrial Seminars*
  - Austrian Research Institute for Artificial Intelligence, Vienna
    - ▷ Data Mining
    - ▷ Learning Agents on the Web
    - ▷ Knowledge Discovery and Data Mining
    - ▷ Case-Based Reasoning
- Mar 1997
- Dec 1996
- Jan 1996
- May 1993
- *Scientific Talks*
  - Numerous presentations at major Artificial Intelligence (IJCAI, AAAI, ECAI), Machine Learning (ICML, ECML), and Data Mining (PKDD) conferences and workshops (see Publications)
- Ph.D. Theses
  - co-referent for
    - ▷ Andreas Faatz: *Ein Verfahren zur Anreicherung fachgebietsspezifischer Ontologien durch Begriffsvorschläge*, TU Darmstadt, 2004
    - ▷ Klaus Brinker: *Active Learning with Kernel Machines*, University of Paderborn, 2004
    - ▷ Klaus Varrentrapp: *A Practical Framework for Adaptive Metaheuristics*, TU Darmstadt, 2005
    - ▷ Tony Lindgren: *Methods of Solving Conflicts among Induced Rules*, Stockholm University, 2006
    - ▷ Tadeusz Pietraszek: *Alert Classification to Reduce False Positives in Intrusion Detection*, Albert-Ludwigs Universität Freiburg, 2006
    - ▷ Ulrich Rückert: *A Statistical Approach to Rule Learning*, TU München, 2008
    - ▷ Ingo Schwab: *Data Mining in kombinatorischen Spielen*, Friedrich Schiller-Universität Jena, 2008
    - ▷ Dietmar Lippold: *Begriffserwerb aus großen Mengen von Beispielen*, Universität Stuttgart, 2008
    - ▷ Stijn Vanderlooy: *Ranking and Reliable Classification*, University of Maastricht, 2009
    - ▷ Jens Hühn: *Induction and Fuzzification of Classification Rules*, Philipps-Universität Marburg, 2009
    - ▷ Jilles Vreekes: *Making Pattern Mining Useful*, Universiteit Utrecht, 2009
  - Currently supervising 6 Ph.D. students.

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## Scientific Activities

- Action Editor
- *Machine Learning* (2003–)
  - *Data Mining and Knowledge Discovery* (2009–2011)
- Editorial Board
- *Machine Learning* (2001–)
  - *Journal of Artificial Intelligence Research* (2005–2008)
  - *Data Mining and Knowledge Discovery* (2007–)
  - *Applied Artificial Intelligence*
  - *International Journal of Intelligent Games & Simulation*
  - *Journal of Interesting Negative Results in Natural Language Processing and Machine Learning*
- Scientific Events
- Program Co-Chair 27th International Conference on Machine Learning (ICML) 2010
  - Proposals Co-Chair of the ECML/PKDD Steering Committee (2008–2011)
  - Member of the Steering Committee of the ECML/PKDD conference series 2006–2009
  - Program Co-Chair European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML/PKDD) 2006
  - Member of the IEEE CIS Task Force on Machine Learning
  - Co-Chair Fachgruppentreffen Maschinelles Lernen (FGML-05)
  - Tutorial Chair DS-05
  - Workshop and Tutorial Chair ICML 2004
  - Tutorial Co-chair ECML/PKDD 2002
  - Workshop Co-chair ECML/PKDD 2001
- Organization
- ECML/PKDD-09 Workshop on “Preference Learning” (with E. Hüllermeier)
  - ECML/PKDD-09 Workshop on “From Local Patterns to Global Models” (with A. Knobbe)
  - ECML/PKDD-08 Workshop on “Preference Learning” (with E. Hüllermeier)
  - ECML/PKDD-08 Workshop on “From Local Patterns to Global Models” (with A. Knobbe)
  - Co-Chair of the “The 17th European Conference on Machine Learning and the 10th European Conference on Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD-06)” (with T. Scheffer and M. Spiliopoulou)
  - LWA-05 Workshop of the “GI Fachgruppe für Maschinelles Lernen (FGML-05)” (with G. Grieser)
  - GfKI-05 Session on “Multi-Label Classification, Ranking, and Preference Learning” (with E. Hüllermeier)
  - CGAIDE-04 Session on “Learning and Adaptation in Games” (with P. Spronck)
  - ECML/PKDD-04 Workshop “Advances in Inductive Rule Learning”
  - KI-03 Workshop “Preference Learning: Models, Methods, Applications” (with E. Hüllermeier)
  - ECML/PKDD-02 Workshop “Salon des refusés — When learning and mining methods misbehave” (with H. Bensusan, G. Giraud-Carrier, M. Sebag; WS was cancelled)
  - ICML-99 Workshop on “Machine Learning in Game Playing” (with M. Kubat)

## Scientific Activities (continued)

- Senior PC Member
  - ICML-96 Workshop on “Data Mining with Inductive Logic Programming” (with B. Pfahringer)
  - Senior PC Member KDD-09
  - Area Chair ICML-09
  - Senior PC Member ICML-08
  - Area Chair PAKDD-08
  - Area Chair ECML/PKDD-08
  - Area Chair ECML/PKDD-07
  - Area Chair ECAI-06
  - Area Chair ICML-05
  - Area Chair ECML/PKDD-05
  - Area Chair ICML-04
  - Vice Chair ICDM-04
- PC Member
  - **IJCAI**: International Joint Conference on Artificial Intelligence (05 Poster PC, 09)
  - **AAAI**: National Conference on Artificial Intelligence (06,07)
  - **ECAI**: European Conference on Artificial Intelligence (06,08)
  - **KI**: Annual German Conference on Artificial Intelligence (09)
  - **ICML**: International Conference on Machine Learning (99,02–09)
  - **ECML/PKDD**: European Conference on Machine Learning and Principles and Practice of Knowledge Discovery (01–09)
  - **ECML**: European Conference on Machine Learning (98–00)
  - **ACML**: Asian Conference on Machine Learning (09)
  - **ICMLA**: International Conference on Machine Learning and Applications (04,05)
  - **ILP**: International Conference on Inductive Logic Programming (02,05)
  - **KDD**: ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (08,09)
  - **PAKDD**: Pacific-Asia Conference on Knowledge Discovery and Data Mining (07-09)
  - **SDM**: SIAM International Conference on Data Mining (04–08,10)
  - **ICDM**: IEEE International Conference on Data Mining (04–09)
  - **IDA**: International Symposium on Intelligent Data Analysis (09)
  - **DS**: International Conference on Discovery Science (03–05,07-09)
  - **DaWaK**: International Conference on Data Warehousing and Knowledge Discovery (06,07)
  - **SIGIR**: International ACM SIGIR Conference (04–09)
  - **ECIR**: European Conference on Information Retrieval (03,04,07-09)
  - **CIKM**: ACM Conference on Information and Knowledge Management (08)
  - **KEOD**: International Conference on Knowledge Engineering and Ontology Development (09)
  - **IICAI**: Indian International Conference on Artificial Intelligence (09)
  - **SBIA**: Brazilian Symposium on Artificial Intelligence (08)
  - **CGAIDE**: International Conference on Computer Games: Artificial Intelligence, Design and Education (04)
  - **zfxCON**: Konferenz zur Computerspieleentwicklung (05)
- Workshop PC
  - ECML/PKDD-09 Workshop on Learning from Multi-Label Data
  - NIPS-08 Workshop on Cost Sensitive Learning
  - IJCAI-05 Workshop on Reasoning, Representation, and Learning in Computer Games

## Scientific Activities (continued)

- ICML-05 Workshop on Learning with Multiple Views
  - ICML-05 Workshop on ROC Analysis in Machine Learning
  - ECML/PKDD-04 Workshop on Advances in Inductive Rule Learning
  - ECAI-04 Workshop on ROC Analysis in AI
  - KI-03 Workshop on Preference Learning
  - ICML-99 Workshop on Machine Learning in Game Playing
  - IJCAI-97 Workshop on Frontiers of Inductive Logic Programming
  - ICML-96 Workshop on Data Mining with Inductive Logic Programming
- Guest Editor
- *Data Mining and Knowledge Discovery*, Special Issue on “Global Modeling using Local Patterns” (with A. Knobbe)
  - *Machine Learning*, Special Issue on “Machine Learning in Games” (with M. Bowling, T. Graepel, R. Musick)
  - *Applied Artificial Intelligence*, Special Issue on “First-Order Knowledge Discovery in Databases” (with B. Pfahringer)
- Reviewer
- Journals: *AI Communications* (02,05), *ACM Transactions on Information Systems* (08), *Annals of Operations Research* (05), *Applied Artificial Intelligence* (94–07,09), *Applied Intelligence* (02,03), *Applied Intelligence Review* (09), *Artificial Intelligence in Medicine* (06), *Computing and Systems* (03), *Cybernetics & Systems* (94–00), *Data Mining and Knowledge Discovery* (98,04,06-09), *Fundamenta Informaticae* 08, *ICCA Journal* (97–99), *ICGA Journal* (09), *IEEE Intelligent Systems* (01), *IEEE Trans. on Knowledge and Data Engineering* (02,08), *IEEE Trans. on Neural Networks* (05), *IEEE Trans. on Pattern Analysis and Machine Intelligence* (04,08), *IEEE Trans. on Systems, Man and Cybernetics* (04,05), *Informatica* (94), *Information Processing Letters* (95), *Information Sciences* (02), *International Journal of Approximate Reasoning* (09), *Journal of Artificial Intelligence Research* (03,05–07), *Journal of Computer and System Sciences* (04), *Journal of Intelligent Information Systems* (01), *Journal of Machine Learning Research* (02–04,06,08), *Kuwait Journal of Science and Engineering* (07), *Knowledge and Information Systems* (07), *Machine Learning* (98–08), *Theoretical Computer Science* (99)
  - Funding Agencies: *German Research Foundation (DFG)* (07–09), *U.S. National Science Foundation (NSF)* (09), *Swiss National Funds (SNF)* (08), *Swiss State Secretariat for Education and Research* (09), *Academy of Finland* (07), *Science Foundation Ireland* (06), *Israel Science Foundation (ISF)* (03,05), *Academy of Sciences of the Czech Republic* (04), *Netherlands Organisation for Scientific Research (NWO)* (05,06), *Microsoft Ph.D. Scholarship Program* (07)
  - Universities: University of Helsinki Professorship Candidates (2009)
  - Publishers: *Morgan Kaufmann* (08)
  - Areas: Machine Learning, Data Mining, Game Playing, Web Mining, Inductive Logic Programming, Case-Based Reasoning
- Awards
- Outstanding Editor Award, *Machine Learning*, 2005
  - Named “Best Reviewer” at ECML/PKDD-01 and ECML/PKDD-03 conferences
- Research Areas
- Inductive Rule Learning, Preference Learning and Ranking, Noise handling, Selective Sampling, Pairwise Classification, Inductive Logic Programming, Web Mining and Text Classification, Ensemble Methods and Meta-Learning, Machine Learning in Game Playing, Data Mining in the Social Sciences

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## Miscellaneous

### *Awards and Competition Results*

- 2009 • *Carl Smith Award* for best student paper at *Discovery Science* conference in Porto
- 2009 • Student Team wins 3rd Place at *IJCAI-09 Computer Poker Challenge*
- 2008 • Student Team wins 2nd Place at *AAAI-08 Computer Poker Challenge*
- 2007 • Student wins 3rd Place in annual *Data Mining Cup*, 2nd best university result
- 2006 • Student wins 5th Place in annual *Data Mining Cup*, 2nd best university result

### *Stipends*

- 1991 • Stipend from University of Chicago's AI Laboratory
- 1997—1998 • FWF Erwin Schrödinger Stipendium for post-doc year in the USA
- 2002—2005 • Apart Stipendium of the Austrian Academy of Sciences

### *Invitations*

- 19. 5. 2008 • “Preference Learning”, Invited talk at the BeneLearn-08 conference
- 14. 5. 2008 • “Learning by Modeling Preferences”, Fraunhofer IGD Darmstadt
- 15. 7. 2004 • “Knowledge Engineering und Lernen in Spielen”, Forschungszentrum für Begriffliche Wissensverarbeitung, Darmstadt
- 17. 12. 2002 • “Separate-and-Conquer Rule Learning”, Otto-Guericke Universität Magdeburg
- 26. 10. 2002 • Invitation to University of Bristol, 1 week of joint work with Peter Flach
- 12. 6. 2002 • “Web Mining - Nutzung der Vernetzungsstruktur des World-Wide Webs”, TU Darmstadt
- 25. 4. 2002 • “Problemspezifische Ensembles für Mehr-Klassen Probleme und Hypertext Klassifikation”, TU Berlin
- 11. 2. 2002 • Public talk on “Web Mining - Nutzung der Vernetzungsstruktur des World-Wide Webs”, Austrian Research Institute for Artificial Intelligence
- 18. 1. 2001 • Invited talk on “Web Mining — Data Mining im Internet”, University of Rostock
- Feb 1997 • Invitation to Katholieke Universiteit Leuven, Belgium, for 2 weeks (first-order knowledge discovery in chess endgame databases)

### *Public Relations*

- 14.07.2005 • Interviewed by *Die Zeit* on Game Playing and Poker
- 21.10.2002 • Interview with *New Scientist* on the Deep Fritz — Kramnik chess match.
- 04.09.2001 • Participation in a press round-table at the ECML/PKDD-01, Freiburg. Several radio and press interviews on Machine Learning in Game Playing.
- 04.12.2000 • Dr. Dobb's Journal article on “Mind Games” covers Henny (a one-liner that received honorable mention in the *2nd International RoShamBo Competition*)
- 13.08.1999 • Radio Interview (ORF Ö1) on Data Mining
- 17.05.1999 • Press release of FWF on project “Intelligent Data Analysis for Information Retrieval on the World-Wide Web”, copied by Austrian Press Agency and some magazines (e.g., *Format*)
- 06.05.1997 • Radio Live Interview (ORF Radio Wien) on Deep Blue's win over Chess World-Champion Garry Kasparov
- Jan 1996 • Austrian Press Agency release on a Data Mining seminar at ÖFAI, carried by several national newspapers (e.g., *Standard*) and ORF teletext.
- Radio Interview (ORF Blue Danube Radio) on Data Mining