Curriculum Vitae

General Information

Current Position	**Postdoctoral Research Fellow** Department of Computer Science, University of British Columbia
Contact Information	Department of Computer Science University of British Columbia 2366 Main Mall, Vancouver, BC, V6T 1Z4, Canada Phone: +1 (778) 229-7936 Email: hutter@cs.ubc.ca Homepage: http://www.cs.ubc.ca/~hutter
Citizenship	German

Education

2004-2009 *PhD* in Computer Science, University of British Columbia.
Completed October 2009.
Supervisors: Prof. Holger H. Hoos, Prof. Kevin Leyton-Brown & Prof. Kevin P. Murphy
Thesis title: Automated Configuration of Algorithms for Solving Hard Computational Problems
2010 CAIAC Doctoral Dissertation Award for the best thesis in Artificial Intelligence completed at a Canadian University in 2009.

2002-2004 *Hauptdiplom* (equivalent to MSc) in Computer Science, Darmstadt University of Technology.
Completed September 2004.
Supervisors: Prof. Thomas Stützle & Prof. Holger H. Hoos
Ranking: 1st of 82 students

2001-2002 *Visiting graduate studies*, University of British Columbia. Average: A+

1998-2001 *Vordiplom* (comparable to BSc) in Commercial Information Technology, Darmstadt University of Technology. Ranking: 2nd of 100 students

1998-2000 *Vordiplom* (comparable to BSc) in Computer Science, Darmstadt University of Technology.
Ranking: 2nd of 296 students

EMPLOYMENT

Since September 2009	*Postdoctoral research fellow* Department of Computer Science, University of British Columbia Advisors: Prof. Holger H. Hoos & Prof. Kevin Leyton-Brown
2004-2009	*Research Assistant*, University of British Columbia. Project: Automated Configuration of Algorithms for Solving Hard Computational Problems. Advisors: Prof. Holger H. Hoos & Prof. Kevin Leyton-Brown & Prof. Kevin Murphy
Jun-Aug 2005	*Summer research intern*, Microsoft Research Cambridge, UK. Project: Automated parameter adjustment based on runtime predictions. Advisor: Dr. Youssef Hamadi
Jul-Sep 2003	*Summer research intern*, NASA Ames Research Center, Mountain View, CA, USA. Project: Fault diagnosis for autonomous Mars rovers. Advisor: Dr. Richard Dearden
Jun-Aug 2002	*Summer research intern*, NASA Ames Research Center, Mountain View, CA, USA. Project: Fault diagnosis for autonomous Mars rovers. Advisor: Dr. Richard Dearden

AWARDS

01/2011	Best paper award (second prize) at Learning and Intelligent Optimization (LION-5), Rome, Italy (2^{nd} best of 49 accepted papers/99 submissions)
07/2010	2010 **IJCAI/JAIR Best Paper Prize** for the 2008 JAIR article *SATzilla: Portfolio-based Algorithm Selection for SAT*, jointly with Lin Xu, Holger Hoos, and Kevin Leyton-Brown (all JAIR papers published 2005–2009 were eligible)
06/2010	2010 CAIAC **Doctoral Dissertation Award** for the best thesis in Artificial Intelligence at a Canadian University completed in 2009
01/2010	Runner-up best paper award at Learning and Intelligent Optimization (LION-4), Venice, Italy (2^{nd} best of 19 accepted papers/57 submissions)
07/2009	Three first and two second prizes in 5 of the 9 categories of the international **2009 SAT Competition** for the SAT solver SATzilla, jointly with Lin Xu, Holger Hoos, and Kevin Leyton-Brown
09/2007	Best poster award at the Doctoral Symposium of the 2007 International Workshop on Engineering Stochastic Local Search Algorithms, Brussels, Belgium
07/2007	First prize in the quantifier-free bit-vector arithmetic category of the international **2007 Satisfiability Modulo Theories (SMT) Competition** (the solver was built by Domagoj Babić and configured in our joint work with Holger Hoos, and Alan Hu)

06/2007	Three first prizes, one second and one third prize in 5 of the 9 categories of the international **2007 SAT Competition** for the SAT solver SATzilla, jointly with Lin Xu, Holger Hoos, and Kevin Leyton-Brown
04/2000	**Best Teaching Assistant Award**, Darmstadt University of Technology, 2000
11/1999	7th place (best German team) in Northwestern European Regional Programming Contest of the ACM, 's-Hertogenbosch, Netherlands, 1999, jointly with Stephan Pochmann and Thomas Strohmann

SCHOLARSHIPS

2010–2012	Post-doctoral Research Fellowship from the German Research Foundation (DFG) (€ 36 696/year, for 2 years)
2009–2010	Post-doctoral Research Fellowship from the Canadian Bureau of International Education (CAD $32 000/year)
2006–2008	Doctoral Fellowship by the German National Academic Foundation. € 12,240/year
2005–2007	University Graduate Fellowship, University of British Columbia (cancelled after 1 year due to above fellowship). CAD $16,000/year
2004–2005	Foreign Exchange Scholarship from the German National Academic Foundation. € 5,800
2003–2004	Scholarship from the German National Academic Foundation. € 960
Jul-Sep 2003	NASA Ames Summer Student Research Scholarship, granted by the Universities Space Research Association, 2003. $US 17,000
Jun-Aug 2002	NASA Ames Summer Student Research Scholarship, granted by the Universities Space Research Association, 2002. $US 17,000
2001–2002	Foreign Exchange Scholarship from the German Academic Exchange Service. € 9,200

TEACHING EXPERIENCE

01/2011–04/2011	**Instructor** for undergraduate course CPSC 322 (Introduction to Artificial Intelligence), University of British Columbia. Sole responsibility for the course with 78 registered students and 3 TAs.
01/2009–12/2009	**Course Development** under the Science Education Initiative of Nobel Laureate Carl Wieman, University of British Columbia. Improved courses CPSC 322 (Introduction to Artificial Intelligence; together with Prof. K. Leyton-Brown) & CPSC 422 (Intelligent Systems; together with Prof. C. Conati)
09/2005–12/2005	Teaching assistant for CPSC 540, graduate course on "Probabilistic Machine Learning", University of British Columbia; taught by Prof. K. Murphy
01/2005–04/2005	Teaching assistant for CPSC 422, undergraduate course "Intelligent Systems", University of British Columbia; taught by Prof. D. Poole
04/2003–09/2003	Teaching assistant for graduate course "Knowledge Representation", Darmstadt University of Technology; taught by Prof. W. Bibel
04/2001–09/2001	Teaching assistant for undergraduate course "Computer Science 4" (formal languages, automata and complexity theory), Darmstadt University of Technology; taught by Prof. U. Brandt
10/2000–03/2001	Teaching assistant for undergraduate course "Computer Science 3" (graph theory and data structures), Darmstadt University of Technology; taught by Prof. H. Waldschmidt
10/1999–03/2000	Teaching assistant for undergraduate course "Computer Science 1" (object orientation, abstract data types, and verification), Darmstadt University of Technology; taught by Prof. W. Henhapl

STUDENT SUPERVISION

Since 01/2012	Primary supervisor for full-time research programmer Steve Ramage. Project: *Java Implementation of Sequential Model-based Algorithm Configuration.* Secondary supervisors are Holger Hoos and Kevin Leyton-Brown
05/2011–08/2011	Primary supervisor for full-time undergraduate Co-op student Jonathan Shen. Project: *Java Implementation of Efficient Operations in Random Forests.* Secondary supervisors were Holger Hoos and Kevin Leyton-Brown
01/2011–08/2011	Primary supervisor for full-time undergraduate Co-op student Maverick Chan. Project: *Supporting Sequential Model-based Algorithm Configuration and Surrogate Configuration Scenarios in HAL* Secondary supervisors were Holger Hoos and Kevin Leyton-Brown

05/2010–08/2010	Primary supervisor for full-time undergraduate summer student Vincent Chu. Project: *Implementing Sequential Model-based Algorithm Configuration in HAL* Secondary supervisors were Holger Hoos and Kevin Leyton-Brown

PUBLICATIONS

Theses

1. **Hutter, F.** (2009). Automated Configuration of Algorithms for Solving Hard Computational Problems. PhD thesis, University of British Columbia, Vancouver, Canada; October 2009.
2010 CAIAC Doctoral Dissertation Award.

2. **Hutter, F.** (2004). Stochastic Local Search for Solving the Most Probable Explanation Problem in Bayesian Networks. MSc thesis, Darmstadt University of Technology, Darmstadt, Germany; September 2004.

Refereed Journal Publications

3. **Hutter, F.**, Hoos, H. H., and Leyton-Brown, K. (2010). Tradeoffs in the Empirical Evaluation of Competing Algorithm Designs. *Annals of Mathematics and Artificial Intelligence*, 60(1-2): 65–89. Special Issue on Learning and Intelligent Optimization.

4. **Hutter, F.**, Hoos H. H., and Leyton-Brown, K, and Stützle, T. (2009). ParamILS: An Automatic Algorithm Configuration Framework. *Journal of Artificial Intelligence Research*, 36(1):267–306.

5. Xu, L., **Hutter, F.**, Hoos H. H., and Leyton-Brown, K. (2008). SATzilla: Portfolio-based Algorithm Selection for SAT. *Journal of Artificial Intelligence Research*, 32(1):565–606.
2010 IJCAI/JAIR Best Paper Prize.

6. Andronescu, M., Fejes, A. P., **Hutter, F.**, Hoos, H. H., and Condon, A. (2004). A New Algorithm for RNA Secondary Structure Design. *Journal of Molecular Biology*, 336(3):607–624.

7. de Freitas, N., Dearden, R., **Hutter, F.**, Morales-Menendez, R., Mutch, J., and Poole, D. (2004). Diagnosis by a Waiter and a Mars Explorer. *Proceedings of the IEEE, Special Issue on Sequential State Estimation*, 92(3):455–468.

Refereed Conference Publications

I list acceptance rates for all conferences in this section, as (AR: ⟨papers accepted⟩/⟨papers submitted⟩ = ⟨percentage⟩).

8. Xu, L., **Hutter, F.**, Hoos H. H., and Leyton-Brown, K. (2012). Evaluating Component Solver Contributions in Portfolio-based Algorithm Selectors. Submitted to the *15th Intl. Conf. on Theory and Applications of Satisfiability Testing (SAT'12)*.

9. **Hutter, F.**, Hoos, H. H., Leyton-Brown, K. (2012). Parallel Algorithm Configuration. *Learning and Intelligent Optimization (LION-6)*. To appear. (AR 24/77=31%)

10. **Hutter, F.**, Hoos, H. H., Leyton-Brown, K. (2011). Sequential Model-Based Optimization for General Algorithm Configuration. *Learning and Intelligent Optimization (LION-5)*. (AR 49/99 = 49%)
Best Paper Award (second prize).

11. **Hutter, F.**, Hoos, H. H., and Leyton-Brown, K. (2010) Automated Configuration of Mixed Integer Programming Solvers. *International Conference on Integration of Artificial Intelligence (AI) and Operations Research (OR) techniques in Constraint Programming (CPAIOR'10)*, 186–202. (AR 18/39=46%)

12. **Hutter, F.**, Hoos, H. H., Leyton-Brown, K. and Murphy, K. (2010). Time-Bounded Sequential Parameter Optimization. *Learning and Intelligent Optimization (LION-4)*, 281–298. (AR 19/57 = 33%)
Runner-up Best Paper Award.

13. **Hutter, F.**, Hoos, H. H., Leyton-Brown, K., and Murphy, K. (2009). An Experimental Investigation of Model-Based Parameter Optimisation: SPO and Beyond. In *ACM Genetic and Evolutionary Computation Conference (GECCO-09)*. (AR: 220/531 = 41,4%)

14. **Hutter, F.**, Babić, D., Hoos, H. H., and Hu, A. (2007). Boosting Verification by Automatic Tuning of Decision Procedures. *Proc. of Formal Methods in Computer Aided Design (FMCAD'07)*, 27–34. (AR: 23/65 = 35%)

15. Xu, L., **Hutter, F.**, Hoos H. H., and Leyton-Brown, K. (2007). SATzilla-07: The Design and Analysis of an Algorithm Portfolio for SAT. *Proc. of the 13th Intl. Conf. on Principles and Practice of Constraint Programming (CP'07)*, 712–727. (AR: 43/143 = 30%)

16. **Hutter, F.**, Hoos, H. H., and Stützle, T. (2007). Automatic Algorithm Configuration based on Local Search. *Proc. of the 22nd National Conf. on Artificial Intelligence (AAAI'07)*, 1152–1157. (AR: 253/921 = 27.5%)

17. **Hutter, F.**, Hamadi, Y., Hoos, H. H., and Leyton-Brown, K. (2006). Performance Prediction and Automated Tuning of Randomized and Parametric Algorithms. *Proc. of the 12th Intl. Conf. on Principles and Practice of Constraint Programming (CP'06)*, 213–228. (AR: 42/142 = 30%)

18. **Hutter, F.**, Hoos, H. H., and Stützle, T. (2005). Efficient SLS for MPE Solving. *Proc. of the 19th Intl. Joint Conf. on Artificial Intelligence (IJCAI'05)*, 169–174. (AR: 240/1329 = 18%)

19. **Hutter, F.**, Tompkins, D. D. A. and Hoos, H. H. (2002). Scaling and Probabilistic Smoothing: Efficient Dynamic Local Search for SAT. *Proc. of the 8th Intl. Conf. on Principles and Practice of Constraint Programming (CP'02)*, 233–248. (AR: 44/146 = 30%)

Refereed Workshop Publications

20. **Hutter, F.**, Hoos, H. H., Leyton-Brown, K. (2011). Bayesian Optimization With Censored Response Data. *NIPS-11 workshop on Bayesian Optimization, Experimental Design, and Bandits*.

21. Xu, L., **Hutter, F.**, Hoos H. H., and Leyton-Brown, K. (2011). Hydra-MIP: Automated Algorithm Configuration and Selection for Mixed Integer Programming. *RCRA workshop on Experimental Evaluation of Algorithms for Solving Problems with Combinatorial Explosion* at IJCAI-11.

22. **Hutter, F.** (2007). On the Potential of Automatic Algorithm Configuration. *Proc. of the Doctoral Symposium on Engineering Stochastic Local Search Algorithms (SLS-DS'07)*.
Best Poster Award.

23. **Hutter, F.**, Hamadi, Y., Hoos, H. H., and Leyton-Brown, K. (2006). Performance Prediction and Automated Tuning of Randomized and Parametric Algorithms: An Initial Investigation. *AAAI-06 Workshop on Learning for Search*

24. Dearden, R., **Hutter, F.**, Simmons, R., Thrun, S. Verma, V., and Willeke, T. (2004). Real-time Fault Detection and Situational Awareness for Rovers: Report on the Mars Technology Program Task. *Proc. of the IEEE Aerospace Conference*

25. **Hutter, F.** and Dearden, R. (2003). The Gaussian Particle Filter for Diagnosis of Non-Linear Systems. *Proc. of the 14th Intl. Workshop on Principles of Diagnosis (DX'03)*, 65–70.

26. **Hutter, F.** and Dearden, R. (2003): Efficient On-line Fault Diagnosis for Non-Linear Systems. *Proc. of the 7th Intl. Symp. on Artificial Intelligence and Robotics in Space (i-SAIRAS'03)*.

Book Chapters

27. **Hutter, F.**, Bartz-Beielstein, T., Hoos, H. H., Leyton-Brown, K, and Murphy, K. (2010). Sequential Model-Based Parameter Optimisation: an Experimental Investigation of Automated and Interactive Approaches. Chapter 15 in *Empirical Methods for the Analysis of Optimization Algorithms*, pages 361–411.

Edited Proceedings

28. **Hutter, F.** and de Oca, Marco A. Montes, editors (2009). *SLS-DS 2009: Doctoral Symposium on Engineering Stochastic Local Search Algorithms* Technical Report 2009-024, IRIDIA, Université Libre de Bruxelles, Brussels, Belgium, 89 pp.

29. Ruml, W. and **Hutter, F.**, editors, (2006). *Learning for Search: Papers from the AAAI Workshop* AAAI Press Technical Report WS-06-11, 154 pp.

Technical Reports

30. **Hutter, F.**, Hoos, H. H., Leyton-Brown, K. (2010). Sequential Model-Based Optimization for General Algorithm Configuration (extended version). Univ. of British Columbia, Technical report TR-2010-10.

31. **Hutter, F.**, Hoos H. H., and Leyton-Brown, K, and Stützle, T. (2009). ParamILS: An Automatic Algorithm Configuration Framework. Univ. of British Columbia, Technical report TR-2009-01.

32. **Hutter, F.** and Hamadi, Y. (2005). Parameter Adjustment Based on Performance Prediction: Towards an Instance-Aware Problem Solver. *Technical Report*, MSR-TR-2005-125, Microsoft Research Cambridge, UK.

33. **Hutter, F.**, Ng, B., Dearden, R. (2004). Incremental Thin Junction Trees for Dynamic Bayesian Networks. *Technical Report*, Intellectics Group, Dept. of Computer Science, Darmstadt Univ. of Technology, TR-AIDA-04-01.

34. Andronescu, M., Fejes, A. P., Hamze, **Hutter, F.**, F., Hoos, H. H., and Condon, A. (2002). A New SLS Algorithm for RNA Secondary Structure Design. *Technical Report*, Dept. of Computer Science, Univ. of British Columbia, TR-2002-10.

INVITED PRESENTATIONS

08/2011 *Helping Domain Experts Build Better Algorithms: Automated Performance Modelling, Configuration and Selection*. Google tech talk, Mountain View, CA, USA

12/2010–02/2011 *Automated Algorithm Configuration and Selection: Enabling Technologies for Building Better Algorithms*. Invited talks at
Simon Fraser University. February 3, 2011
University of Freiburg. December 16, 2010
University of Potsdam. December 14, 2010
University of New Hampshire (UNH). December 7, 2010
Massachusetts Institute of Technology (MIT). December 6, 2010

05/2010 *Doing a PhD in AI: a case study*. Invited speaker at the Graduate Student Symposium of the Canadian Artificial Intelligence conference (AI-10), Ottawa, Canada

05/2010 *Automated Configuration of Algorithms for Solving Hard Computational Problems*. COSA Colloquium, Cologne University of Applied Sciences

05/2008 *Automated algorithm configuration based on search and learning*. Darmstadt University, Germany

05/2008 *Automated algorithm configuration: boosting performance while reducing development time*. First Search & Biology day at the INRIA/MSR joint lab, Paris, France

07/2005 *Automated Parameter Setting Based on Runtime Prediction: Towards an Instance-Aware Problem Solver*. Cork Constraint Computation Centre, University College Cork, Ireland

PROFESSIONAL SERVICE

Workshop Organization

Co-chair, NIPS workshop on Bayesian Optimization, Experimental Design, and Bandits, 2011.

Co-chair, Doctoral Symposium on Engineering Stochastic Local Search Algorithms (SLS-DS-09), 2009.

Co-chair, AAAI-06 Workshop on Learning for Search, 2006.

Program Committees

Combining Constraint solving with Mining and Learning (CoCoMile'12 @ ECAI)
Computational Sustainability Track of AAAI 2012, (CompSustAI'12)
AAAI Conf. on Artificial Intelligence 2012 (AAAI'12)
Learning and Intelligent Optimization 2011 (LION'12)
International Joint Conf. on Artificial Intelligence 2011 (IJCAI'11)
Genetic and Evolutionary Computation Conference 2011 (GECCO'11)
Learning and Intelligent Optimization 2011 (LION'11)
Canadian Conference on Artificial Intelligence 2011 (AI'11)
Canadian Conference on Artificial Intelligence 2010 (AI'10)

Journal Reviewing

Annals of Mathematics and Artificial Intelligence
Annals of Operations Research
Artificial Intelligence
Automatica
IEEE Journal of Oceanic Engineering
IEEE Transactions on Signal Processing
Industrial & Engineering Chemistry Research
Informs Journal on Computing
Journal of Artificial Intelligence Research
Journal of Machine Learning Research
Journal of Satisfiability
Journal of Scheduling
The Computer Journal

Conference Reviewing

AAAI: AAAI Conf. on Artificial Intelligence
CP: Int. Conf. on Principles and Practice of Constraint Programming
CP-AI-OR: Int. Conf. on Integration of AI and OR in CP
GECCO: Genetic and Evolutionary Computation Conference
IJCAI: International Joint Conf. on Artificial Intelligence
LION: Learning and Intelligent Optimization
NIPS: Neural Information Processing Systems
SAT: Theory and Applications of Satisfiability Testing

Workshop Reviewing

ANTS: Workshop on Ant Colony Optimization and Swarm Intelligence
SLS: Workshop on Engineering Stochastic Local Search Algorithms
WEA: Workshop on Experimental Algorithms
LFS: AAAI Workshop on Learning for Search

University Committees (UBC)

Computer science faculty recruiting committee, 2006 & 2008–2010
Computer science postdoc liaison, 2008–2010
Computer science faculty affairs committee, 2007
Computer science graduate affairs committee, 2005–2007
Graduate student society councillor, 2005
Institute for Computing, Information & Cognitive Systems social committee, 2006–2008

FUNDING ACQUISITION

Research grants, as proposal contributor

Jan-Dec 2012	Compute Canada project proposal for compute resources valued at over CAD $200 000. Substantial involvement in design and drafting of the proposal. PI: Holger Hoos, co-PI: Kevin Leyton-Brown.
Jan-Dec 2011	Compute Canada project proposal for compute resources valued at over CAD $200 000. Substantial involvement in design and drafting of the proposal. PI: Holger Hoos, co-PI: Kevin Leyton-Brown.
2008–2010	MITACS[1] project *Automated Design of Heuristic Algorithms from Components*, CAD $74 624/year, for 3 years. Substantial involvement in design and drafting of the proposal. PI: Holger Hoos, co-PI: Kevin Leyton-Brown

[1] Mathematics of Information Technology and Complex Systems

Primary References

1. **Prof. Henry Kautz, PhD**
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   Tel: +1 (585) 275-3772
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   Department of Computer Science
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2. **Prof. Dr. Holger Hoos**
   (University of British Columbia)
   Email: hoos@cs.ubc.ca
   Tel: +1 (604) 822-1964
   Fax: +1 (604) 822-5485
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   2366 Main Mall
   Vancouver, BC, V6T 1Z4
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3. **Prof. Kevin Leyton-Brown, PhD**
   (University of British Columbia)
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Additional References

4. **Prof. Guy Lapalme, PhD**
   (Université de Montréal)
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   CP 6128 succ Centre-Ville Montréal, QC, H3C 3J7
   Canada

5. **Prof. Alan Mackworth, PhD**
   (University of British Columbia)
   Email: mack@cs.ubc.ca
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