

Malte Helmert

Curriculum Vitae (October 2017)

Personal Details

Prof. Dr. Malte Helmert

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Current Position

since 06/2016 associate professor (tenured) for computer science
at the University of Basel, Switzerland;
head of the Artificial Intelligence research group

Previous Appointments

06/2011–05/2016 assistant professor (tenure track) for computer science
at the University of Basel, Switzerland;
head of the Artificial Intelligence research group

10/2011 declined appointment as associate professor (tenured) for computer science
at Saarland University, Germany

11/2008–10/2011 adjunct senior research fellow
at Institute for Integrated and Intelligent Systems,
Griffith University, Brisbane, Australia

12/2006–05/2011 post-doctoral researcher (*Akademischer Rat auf Zeit*)
at University of Freiburg, Germany

04/2004–11/2006 research assistant and teaching assistant
at University of Freiburg, Germany

Education

06/2006 Ph.D. degree (*Dr. rer. nat.*) from University of Freiburg, Germany
Thesis: *Solving Planning Tasks in Theory and Practice*
grade *summa cum laude* (with distinction)

04/2001–06/2006 Ph.D. student at University of Freiburg, Germany

03/2001 *Diplom* (~M.Sc.) in computer science (*Informatik*)
from University of Freiburg, Germany
grade 1.0 (with distinction)

10/1997–03/2001 studies of computer science
at University of Freiburg, Germany
and University of Durham, United Kingdom

Scholarships

- cancelled (2011–2014) Marie Curie International Outgoing Fellowship for project *Abstraction Heuristics for Planning and Combinatorial Search (AHPACS)* funded by the European Commission (granted 12/2009)
cancelled because of appointment to University of Basel
- 04/2003–03/2004 scholar of graduate programme *Mathematical Logic and Applications* at University of Freiburg, Germany
funded by the German Research Foundation (*DFG-Graduiertenkolleg*)
- 04/2001–03/2003 scholar of graduate programme *Human and Machine Intelligence* at University of Freiburg, Germany
funded by the German Research Foundation (*DFG-Graduiertenkolleg*)
- 09/1999–03/2001 scholar of German National Merit Foundation
(*Studienstiftung des Deutschen Volkes*)

Awards

Awards for General Academic Achievement

- 07/2011 *IJCAI-11 Computers and Thought Award*
“for fundamental contributions to the theory and practice in automated planning and combinatorial search”
presented at IJCAI 2011 in Barcelona, Spain
- The Computers and Thought Award has been described as “generally regarded as the most prestigious award in artificial intelligence” (quoted from <http://tinyurl.com/computers-and-thought-award>).

Awards for Academic Publications

- 07/2017 *ICAPS 2017 Best Student Paper Award* for the ICAPS 2017 paper “Unsolvability Certificates for Classical Planning”
at ICAPS 2017 in Pittsburgh, Pennsylvania, USA
(with Salomé Eriksson and Gabriele Röger)
- Sole recipient of the award (number of eligible submissions unknown).
- 07/2017 *SoCS 2017 Best Paper Award* for the SoCS 2017 paper “Understanding the Search Behaviour of Greedy Best-First Search”
at SoCS 2017 in Pittsburgh, Pennsylvania, USA
(with Manuel Heusner and Thomas Keller)
- Out of 36 conference submissions, this was the sole recipient of the award.
- 06/2016 *ICAPS 2016 Influential Paper Award* for the ICAPS 2004 paper “A Planning Heuristic Based on Causal Graph Analysis”
at ICAPS 2016 in London, United Kingdom
- The ICAPS Influential Paper Awards honor significant and influential papers published at least ten years earlier in a planning and scheduling conference. This was the sole recipient of the award.

- 01/2015 *Outstanding Paper Award* for the paper
“From Non-Negative to General Operator Cost Partitioning”
at AAAI 2015 in Austin, Texas, USA
(with Florian Pommerening, Gabriele Röger and Jendrik Seipp)
○ Out of 1991 conference submissions, this was the sole recipient of the award.
- 07/2014 *Outstanding Paper Award Honorable Mention* for the paper
“Generalized Label Reduction for Merge-and-Shrink Heuristics”
at AAAI 2014 in Québec City, Québec, Canada
(with Silvan Sievers and Martin Wehrle)
○ Out of 1406 conference submissions, 1 paper received the award and 4 received honorable mentions.
- 06/2014 *Best Paper Award* for the paper
“LP-based Heuristics for Cost-optimal Planning”
at ICAPS 2014 in Portsmouth, New Hampshire, USA
(with Florian Pommerening, Gabriele Röger and Blai Bonet)
○ Out of 164 conference submissions, this was the sole recipient of the award.
- 06/2013 *Best Paper Award* for the paper
“The Relative Pruning Power of Strong Stubborn Sets and Expansion Core”
at ICAPS 2013 in Rome, Italy
(with Martin Wehrle, Yusra Alkhazraji and Robert Mattmüller)
○ Out of 146 conference submissions, this was the sole recipient of the award.
- 06/2013 *Best Student Paper Award* for the paper
“Trial-based Heuristic Tree Search for Finite Horizon MDPs”
at ICAPS 2013 in Rome, Italy
(with Thomas Keller)
○ Sole recipient of the award (number of eligible submissions unknown).
- 07/2012 *Best Student Paper Award* for the paper
“Better Parameter-Free Anytime Search by Minimizing Time Between Solutions” at SoCS 2012 in Niagara Falls, Ontario, Canada
(with Jordan T. Thayer and J. Benton)
○ Sole recipient of the award (number of eligible submissions unknown).
- 08/2010 *Best Paper Award* for the paper
“Strengthening Landmark Heuristics via Hitting Sets”
at ECAI 2010 in Lisbon, Portugal
(with Blai Bonet)
○ Out of 607 conference submissions, this was the sole recipient of the award.

- 07/2010 *Best Poster Presentation Award* for the presentation of the paper
 “High-Quality Policies for the Canadian Traveler’s Problem”
 at SoCS 2010 in Stone Mountain, Georgia, USA
 (with Patrick Eyerich and Thomas Keller)
 ○ Out of 14 posters, this was the sole recipient of the award.
- 09/2009 *Best Paper Award* for the paper
 “Landmarks, Critical Paths and Abstractions: What’s the Difference
 Anyway?” at ICAPS 2009 in Thessaloniki, Greece
 (with Carmel Domshlak)
 ○ Out of 159 conference submissions, 2 papers received the award.
- 07/2009 *IJCAII-JAIR Best Paper Prize Honorable Mention* for the paper
 “The Fast Downward Planning System”
 awarded at IJCAI 2009 in Pasadena, California, USA
 ○ Out of 274 eligible JAIR papers published in 2004–2009,
 1 paper received the award and 1 received an honorable mention.
- 07/2008 *Outstanding Paper Award* for the paper
 “How Good is Almost Perfect?”
 at AAI 2008 in Chicago, Illinois, USA
 (with Gabriele Röger)
 ○ Out of 937 conference submissions, 2 papers received the award.
- 09/2007 *ICAPS Outstanding Dissertation Award Honorable Mention*
 for PhD dissertation “Solving Planning Tasks in Theory and Practice”
 at ICAPS 2007 in Providence, Rhode Island, USA
 ○ There were 1 winner and 3 honorable mentions for the award.
- 09/2007 *Best Research Paper Award* for the paper
 “Flexible Abstraction Heuristics for Optimal Sequential Planning”
 at ICAPS 2007 in Providence, Rhode Island, USA
 (with Patrik Haslum and Jörg Hoffmann)
 ○ Out of 136 conference submissions, this was the sole recipient
 of the award.
- 06/2004 *Best Student Paper Award* for the paper
 “A Planning Heuristic Based on Causal Graph Analysis”
 at ICAPS 2004 in Whistler, British Columbia, Canada
 ○ There were 2 recipients of the award
 (number of eligible submissions unknown).
- 09/2001 *PLANET Award for Research Excellence* for the paper
 “On the Complexity of Planning in Transportation Domains”
 at ECP 2001 in Toledo, Spain
 ○ Out of 92 conference submissions, 2 received awards.

- 04/2001 *VDI-Förderpreis* (award of the Association of German Engineers) for Diplomarbeit (Master's thesis equivalent) "On the Complexity of Planning in Transportation and Manipulation Domains"
- This award honors the best theses submitted at the Faculty of Engineering of the University of Freiburg in a given calendar year.
In the year 2001, 1 Ph.D. thesis and 1 diplomarbeit were awarded.

Awards for Academic Service

- 06/2016 *ICAPS 2016 Outstanding Reviewer Award*
at ICAPS 2016 in London, United Kingdom
- Out of 96 PC members, 1 received an award.
- 07/2014 *Outstanding Senior Program Committee Member Award*
at AAAI 2014 in Québec City, Québec, Canada
- Out of 55 senior program committee members, 3 received an award.
- 07/2013 *Outstanding Program Committee Member Award*
at AAAI 2013 in Bellevue, Washington, USA
- Out of 600 program committee members, 6 received an award.
- 07/2007 *Outstanding Program Committee Member Award Honorable Mention*
at AAAI 2007 in Vancouver, British Columbia, Canada
- Out of 606 program committee members, 1 received an award and 1 received an honorable mention.

Awards for Planning Systems

- 06/2011 *Winner, Deterministic Sequential Optimization Track*
for the planning system "Fast Downward Stone Soup-1"
at the 7th International Planning Competition (IPC 2011)
at ICAPS 2011 in Freiburg, Germany
(with Jörg Hoffmann, Erez Karpas, Emil Keyder, Raz Nissim, Silvia Richter, Gabriele Röger, Jendrik Seipp and Matthias Westphal)
- Out of 14 planning systems participating in this competition track, 1 was declared winner and 2 were declared runners-up.
- 06/2011 *Runner-up ex-aequo, Deterministic Sequential Optimization Track*
for the planning system "Merge and Shrink"
at the 7th International Planning Competition (IPC 2011)
at ICAPS 2011 in Freiburg, Germany
(with Raz Nissim and Jörg Hoffmann)
- Out of 14 planning systems participating in this competition track, 1 was declared winner and 2 were declared runners-up.

- 06/2011 *Runner-up ex-aequo, Deterministic Sequential Optimization Track*
 for the planning system “Selective Max”
 at the 7th International Planning Competition (IPC 2011)
 at ICAPS 2011 in Freiburg, Germany
 (with Erez Karpas, Carmel Domshlak and Shaul Markovitch)
 ○ Out of 14 planning systems participating in this competition track,
 1 was declared winner and 2 were declared runners-up.
- 06/2011 *Winner, Deterministic Sequential Satisficing Track*
 for the planning system “LAMA 2011”
 at the 7th International Planning Competition (IPC 2011)
 at ICAPS 2011 in Freiburg, Germany
 (with Silvia Richter, Matthias Westphal and Gabriele Röger)
 ○ Out of 27 planning systems participating in this competition track,
 1 was declared winner and 1 was declared runner-up.
- 06/2011 *Runner-up, Deterministic Sequential Satisficing Track*
 for the planning system “Fast Downward Stone Soup-1”
 at the 7th International Planning Competition (IPC 2011)
 at ICAPS 2011 in Freiburg, Germany
 (with Erez Karpas, Silvia Richter, Gabriele Röger and Jendrik Seipp)
 ○ Out of 27 planning systems participating in this competition track,
 1 was declared winner and 1 was declared runner-up.
- 06/2011 *Runner-up, Learning Part*
 for the planning system “Fast Downward Autotune-speed”
 at the 7th International Planning Competition (IPC 2011)
 at ICAPS 2011 in Freiburg, Germany
 (with Chris Fawcett, Holger Hoos, Erez Karpas, Gabriele Röger
 and Jendrik Seipp)
 ○ Out of 8 planning systems participating in this competition,
 1 was declared winner and 1 was declared runner-up.
- 06/2004 *1st Prize, Satisficing Propositional Track*
 for the planning system “Fast (Diagonally) Downward”
 at the 4th International Planning Competition (IPC 2004)
 at ICAPS 2004 in Whistler, British Columbia, Canada
 (with Silvia Richter)
 ○ Out of 17 planning systems participating in this competition track,
 this is the sole recipient of the award.
- 04/2000 *Distinguished Planner Award*
 for the planning system “MIPS”
 at the 2nd International Planning Competition (IPC 2000)
 at AIPS 2000 in Breckenridge, Colorado, USA
 (with Stefan Edelkamp)
 ○ Out of 15 participating planning systems across both competition tracks,
 2 were declared winners (“exceptional performance”)
 and 4 were declared runners-up (“distinguished planner”).

Awards for Teaching

- 05/2017 *Nomination for Teaching Excellence Awards 2017*
at University of Basel
for the course “Foundations of Artificial Intelligence”
in the category “Top Aktuell” (cutting edge)
- 05/2017 *Nomination for Teaching Excellence Awards 2017*
at University of Basel
for the course “Theorie der Informatik” (Theory of Computer Science)
in the category “Starke Fundamente” (strong foundations)
- 09/2014 *Nomination for Credit Suisse Award for Best Teaching*
at University of Basel
for the course “Grundlagen der Künstlichen Intelligenz”
(Foundations of Artificial Intelligence)
◦ Among all courses taught at the University of Basel,
38 were nominated for the award and 1 received it.
- 12/2006 *Lehrpreis des Landes Baden-Württemberg* (state teaching award)
for the “Sommercampus” event (as a co-organizer; 40 000 EUR)
◦ Among all teaching activities at all universities in the German state
of Baden-Württemberg, 3 were awarded in the year 2006.

Acquired Funding

All grants as sole primary investigator unless indicated otherwise.

Ongoing Projects

- 11/2016–01/2019 *European Robotic Goal-Oriented Autonomous Controller (ERGO)*.
Share of budget: 587 179 CHF, 2 post-docs.
European Union.
Consortium with 8 partners. Overall project budget 3 774 610 EUR.
- 05/2015–04/2018 *Reasoning about Plans and Heuristics for Planning
and Combinatorial Search (RAPAHPACS)*.
675 631 CHF, 1 post-doc, 2 Ph.D. students.
Swiss National Science Foundation.
- 02/2014–01/2019 ERC Starting Grant *State Space Exploration:
Principles, Algorithms, Applications (SSX)*.
1 499 737 EUR, 1 post-doc, 3 Ph.D. students.
European Research Council.

Completed Projects

- 01/2015–07/2016 *Automated Reformulation and Pruning in Factored State Spaces (ARAP)*.
165 367 CHF, 1 post-doc.
Swiss National Science Foundation.
- 12/2012–02/2013 *1D Tower Building/2D Twin Tower Building*.
46 500 CHF.
Industry Project, Dematic GmbH.
- 11/2012–10/2014 *Safe Pruning in Optimal State-Space Search (SPOSSS)*.
206 583 CHF, 0.5 post-docs, 1 Ph.D. student.
Swiss National Science Foundation.

- 05/2012–04/2015 *Abstraction Heuristics for Planning and Combinatorial Search (AHPACS)*.
250 000 CHF, 2 Ph.D. students.
Swiss National Science Foundation.
- 12/2010–06/2014 *Kontrollwissen für domänenunabhängige Planungssysteme*
("control knowledge for domain-independent planning systems").
234 000 CHF, 1 post-doc researcher.
German Research Foundation.
Project transferred from University of Freiburg to University of Basel.
- (2011–2014) Marie-Curie International Outgoing Fellowship
to The Australian National University, Canberra, Australia.
240 000 EUR.
European Commission.
Cancelled due to appointment at University of Basel.

Publications

See separate list of publications.

Academic Presentations

Invited Plenary Talks at Major Conferences (500+ Participants)

- 08/2014 Keynote lecture at 21st European Conference on Artificial Intelligence (ECAI 2014), held in Prague, Czech Republic.
Topic: *Are We There Yet?*
- 07/2011 Invited plenary lecture at Twenty-Second International Joint Conference on Artificial Intelligence (IJCAI 2011) held in Barcelona, Spain.
Topic: *At Most Four Approaches to Heuristic Search*
(Computers and Thought Award Lecture).

Other Invited Talks and Panel Presentations at Conferences/Symposia

- 02/2016 Invited talk at the AAAI-2016 Workshop on Beyond NP
held in Phoenix, Arizona, USA.
Topic: *On Planners as Beyond NP Solvers*.
- 11/2015 Invited talk at SGAICO Annual Assembly and Workshop (SGAICO 2015)
held in Geneva, Switzerland
Topic: *Declarative Heuristics for State-Space Search*.
- 07/2013 Invited non-plenary presentation at Twenty-Seventh AAAI Conference on Artificial Intelligence (AAAI 2013) held in Bellevue, Washington, USA.
Topic: *What's Hot at ICAPS?*.
- 08/2012 Invited talk at the Sixth Starting Artificial Intelligence Researchers' Symposium (STAIRS 2012), held in Montpellier, France.
Topic: *How to be a Strong and Happy AI Researcher*.
- 07/2011 Invited talk at the IJCAI-2011 Workshop on Benchmarks and Applications of Spatial Reasoning, held in Barcelona, Spain.
Topic: *Lessons Learned from Benchmarking in the Automated Planning Community*.
- 08/2010 Invited talk at the ECAI-2010 Workshop on Benchmarking Intelligent (Multi-) Robot Systems, held in Lisbon, Portugal.
Topic: *Lessons Learned from Benchmarking in the Automated Planning Community*.

- 07/2010 Invited panelist at Third Annual Symposium on Combinatorial Search (SoCS 2010), held in Stone Mountain, Georgia, USA.
Topic: *Domain-Independent versus Domain-Specific Search*.
- 05/2010 Invited panelist at Twentieth International Conference on Automated Planning and Scheduling (ICAPS 2010), held in Toronto, Canada.
Topic: *The Present and Future(s) of Planning*.
- 07/2008 Invited talk at First International Symposium on Search Techniques in Artificial Intelligence and Robotics (STAIR 2008), held in Chicago, Illinois, USA.
Topic: *Automatically Deriving Abstraction Heuristics*.
- 05/2007 Invited talk at First SFB/TR 8 Benchmark Workshop (workshop of the interdisciplinary Transregional Collaborative Research Center Spatial Cognition), held in Etelsen, Germany.
Topic: *Benchmarking in Planning*.

Invited Talks at Dagstuhl Seminars

- 11/2014 Speaker at Dagstuhl seminar “Automated Planning and Model Checking” held at Schloss Dagstuhl, Wadern, Germany.
Topic: *Heuristics for Classical Planning: We’re More Rigorous Than You Thought!*
- 10/2009 Speaker at Dagstuhl seminar “Graph Search Engineering” held at Schloss Dagstuhl, Wadern, Germany.
Topic: *Landmarks, Critical Paths and Abstractions: What’s the Difference Anyway?*
- 04/2006 Speaker at Dagstuhl seminar “Directed Model Checking” held at Schloss Dagstuhl, Wadern, Germany.
Topic: *A Planning Heuristic Based on Causal Graph Analysis*.
- 11/2001 Speaker at Dagstuhl seminar “Exploration of Large State Spaces” held at Schloss Dagstuhl, Wadern, Germany.
Topic: *Decidability and Undecidability Results for Planning with Numerical State Variables*.

Invited Talks at Universities

- 11/2013 Ben-Gurion University of the Negev, Be’er Sheva, Israel.
Topic: Tutorial on *Planning and Search*.
- 11/2013 Ben-Gurion University of the Negev, Be’er Sheva, Israel.
Topic: *Getting the Most Out of Pattern Databases for Classical Planning*.
- 09/2013 King’s College, London, United Kingdom.
Topic: *Getting the Most Out of Pattern Databases for Classical Planning*.
- 09/2013 King’s College, London, United Kingdom.
Topic: *What’s Hot in Classical Planning?*
- 02/2012 Ben-Gurion University of the Negev, Be’er Sheva, Israel.
Topic: *Heuristics for Domain-Independent Planning* (six-hour graduate course).
- 01/2012 Ben-Gurion University of the Negev, Be’er Sheva, Israel.
Topic: *At Most Four Approaches to Heuristic Search*.
- 05/2010 Carnegie Mellon University, Pittsburgh, USA.
Topic: *Landmarks, Critical Paths and Abstractions: What’s the Difference Anyway?*

- 06/2009 Universidad Carlos III, Madrid, Spain.
Topic: *Planning as heuristic search* (series of six invited lectures).
- 10/2008 Griffith University/NICTA Queensland, Brisbane, Australia.
Topic: *How Good is Almost Perfect?*
- 10/2008 Australian National University/NICTA Canberra, Canberra, Australia.
Topic: *How Good is Almost Perfect?*
- 03/2008 University of Strathclyde, Glasgow, United Kingdom.
Topic: *How Good is Almost Perfect?*
- 02/2008 Universitat Pompeu Fabra, Barcelona, Spain.
Topic: *How Good is Almost Perfect?*
- 02/2008 Universitat Pompeu Fabra, Barcelona, Spain.
Topic: *Domain-Independent Construction of Pattern Database Heuristics for Cost-Optimal Planning.*
- 10/2005 University of Strathclyde, Glasgow, United Kingdom, October 2005.
Topic: *Universal Game Playing – Initial Ideas and Some Experiments in Connect-Four.*
- 04/2001 University of Durham, United Kingdom, April 2001.
Topic: *On the Complexity of Planning in Transportation and Manipulation Domains.*

Tutorials at Major Conferences and Summer Schools

- 06/2015 Tutorial at Twenty-Fifth International Conference on Automated Planning and Scheduling (ICAPS 2015) held in Jerusalem, Israel.
Topic: *LP-based Heuristics for Cost-optimal Classical Planning* (with Florian Pommerening and Gabriele Röger).
- 06/2015 Tutorial at Twenty-Fifth International Conference on Automated Planning and Scheduling (ICAPS 2015) held in Jerusalem, Israel.
Topic: *Latest Trends in Abstraction Heuristics for Classical Planning* (with Jendrik Seipp and Silvan Sievers).
- 01/2015 Tutorial at Twenty-Ninth AAAI Conference on Artificial Intelligence (AAAI 2015) held in Austin, Texas, USA.
Topic: *A Beginner's Introduction to Heuristic Search Planning* (with Gabriele Röger).
- 06/2013 Tutorial at Twenty-Third International Conference on Automated Planning and Scheduling (ICAPS 2013) held in Rome, Italy.
Topic: *Engineering a Heuristic Search Planner* (with Gabriele Röger).
- 09/2009 Tutorial/lecture at ICAPS 2009 Summer School on Automated Planning and Scheduling, held in conjunction with ICAPS 2009, Thessaloniki, Greece.
Topic: *Computational Complexity of Planning.*
- 09/2009 Tutorial/lecture at ICAPS 2009 Summer School on Automated Planning and Scheduling, held in conjunction with ICAPS 2009, Thessaloniki, Greece.
Topic: *Planning as Heuristic Search: From Basics to Advanced Methods* (with Carmel Domshlak).
- 09/2008 Tutorial at Eighteenth International Conference on Automated Planning and Scheduling (ICAPS 2008) held in Sydney, Australia.
Topic: *Abstraction Heuristics for Planning* (with Patrik Haslum).

06/2006 Tutorial at Sixteenth International Conference on Automated Planning and Scheduling (ICAPS 2006) held in the Lake District, United Kingdom.
Topic: *Planning and Complexity*.

Outreach Activities

04/2017 Television interview for SRF1 science magazine “Einstein”.
Topic: *Künstliche Intelligenz – Die Macht der Maschinen*
(Artificial Intelligence – The Power of the Machines).
Originally broadcast on April 13, 2017.

11/2013 Lecture at Seniorenuniversität beider Basel held in Basel, Switzerland.
Topic: *Universelles Problemlösen durch Künstliche Intelligenz*
(Universal Problem Solving through Artificial Intelligence).

Academic Service

University of Basel

- since 12/2015 Member of university website toolkit migration committee
(*Steuerungsausschuss WBK-Migration*)
- since 08/2015 Head of Computer Science curriculum commission
- since 08/2015 Member of Computer Science curriculum commission
- since 08/2015 Member of “Kommission für ausserfakultäre Studienfächer” (commission for extra-faculty degree subjects) of the Faculty of Science
- 09/2016–07/2017 Member of search committee *Adaptive Systems* (Computer Science)
- 10/2015–08/2016 Member of appointment committee *Adaptive Systems* (Computer Science)
- 12/2015–07/2016 Acting head of computer science degree programs
(jointly with Christine Meier)
- 01/2013–06/2015 Member of university website relaunch committee
(*Steuerungsausschuss Redesign Corporate Website www.unibas.ch*)
- 12/2012–10/2014 Member of appointment committee *High Performance Computing*
(Computer Science)
- 03/2013–04/2014 Member of appointment committee *Pure Mathematics* (Mathematics)

Societies and Scientific Organizations

- ICAPS International Conference on Automated Planning and Scheduling
 - ICAPS President-Elect (2016–2018)
 - Member of the ICAPS executive council (2011–2020)
 - ICAPS executive council conference liaison (2012–2016)
- SoCS Symposium on Combinatorial Search
 - Member of the SoCS council (2013–2017)
- AAAI Association for the Advancement of Artificial Intelligence
 - Member
- SI Swiss Computer Science Society
 - Member

- SGAICO SI Special Interest Group on AI and Cognitive Science
○ Member

Journals and Monograph Publishers

- AI Access AI Access foundation
○ Associate editor (2013–2017)
- AIJ Artificial Intelligence Journal
○ Reviewer (2006, 2007, 2008, 2009, 2010, 2011, 2013, 2014)
- JAIR Journal of Artificial Intelligence Research
○ Advisory board member (2016–2019)
○ Associate editor (2010–2016)
○ Editorial board member (2007–2010)
○ Reviewer (2002, 2003, 2004, 2005, 2006, 2007)
○ Member of distinguished paper award selection committee (2013)
- Others ○ AIEDAM (Artificial Intelligence for Engineering Design, Analysis and Manufacturing): Reviewer 2006
○ AMAI (Annals of Mathematics and Artificial Intelligence): Reviewer 2007, 2008, 2010
○ CI (Computational Intelligence): Reviewer 2008
○ IJAIT (International Journal on Artificial Intelligence Tools): Reviewer 2005
○ JAAMAS (Journal of Autonomous Agents and Multi-Agent Systems): Reviewer 2006
○ JACM (Journal of the ACM): Reviewer 2016
○ JCSS (Journal of Computer and System Sciences): Reviewer 2009
○ JoH (Journal of Heuristics): Reviewer 2014
○ JOS (Journal of Scheduling): Reviewer 2007, 2008
○ KI (Künstliche Intelligenz, engl. *Artificial Intelligence*): Reviewer 2009, 2010, 2011
○ TCS (Theoretical Computer Science): Reviewer 2003, 2010, 2013

Funding Agencies

- Agencies Reviewing for international funding agencies:
○ Canada (NSERC): 2014
○ Greece (Hellenic Republic Ministry of Education, Lifelong Learning and Religious Affairs): 2011
○ Israel (ISF): 2008, 2013
○ United Kingdom (EPSRC): 2015

Conferences

- AAAI AAI Conference on Artificial Intelligence
- Tutorial chair (2016, 2017)
 - Area chair (2018)
 - SPC member (2011, 2012, 2014, 2015)
 - PC member (2007, 2008, 2010, 2013)
 - Reviewer (2002, 2005)
 - Senior member track PC member (2015)
 - Late-breaking paper track PC member (2013)
- ECAI European Conference on Artificial Intelligence
- Area chair (2012)
 - SPC member (2016)
 - PC member (2006, 2008, 2010, 2014)
 - Reviewer (2002)
- ICAPS International Conference on Automated Planning and Scheduling
- Conference chair (2011)
 - SPC member (2013, 2014)
 - PC member (2005, 2006, 2007, 2008, 2009, 2010, 2012, 2015, 2016, 2017, 2018)
 - Reviewer (2002, 2003, 2004)
 - Tutorial chair (2009, 2016)
 - ICAPS award committee member (2008, 2010)
 - Journal presentation track chair (2018)
 - Journal presentation track PC member (2013)
 - Doctoral consortium mentor (2007, 2008×2, 2010×2, 2011×2, 2013, 2015, 2016, 2017)
 - Doctoral consortium PC member (2007, 2008, 2009, 2010)
- IJCAI International Joint Conference on Artificial Intelligence
- Advisory board member (2013, 2017)
 - Executive committee member (2013, 2017)
 - Area chair (2015, 2016, 2017)
 - SPC member (2011, 2013)
 - PC member (2009)
 - Reviewer (2005, 2007)
 - Video competition PC member (2013, 2015)
 - Best papers from sister conferences PC member (2015)
- KI Annual German Conference on Artificial Intelligence
- Program chair (2016)
 - PC member (2009, 2010, 2011, 2012, 2013, 2014, 2015, 2017)
- SoCS International Symposium on Combinatorial Search
- Conference chair (2013)
 - PC member (2009, 2010, 2011, 2012, 2014, 2015, 2016, 2017)

- Others
- CAEPIA (Conference of the Spanish Association for AI):
PC member 2009
 - DAGM (Symposium of the German Association for Pattern Recognition):
Reviewer 2002, 2004
 - ICTAI (IEEE International Conference on Tools with AI):
Reviewer 2007
 - ISAIM (International Symposium on AI and Mathematics):
PC member 2008, 2010
 - KR (International Conference on Principles of Knowledge Representation and Reasoning): PC member 2014; reviewer 2004, 2006
 - PRICAI (Pacific Rim International Conference on Artificial Intelligence):
Reviewer 2004
 - STAIRS (Starting AI Researchers' Symposium):
Reviewer 2004

Summer Schools

- ACAI Advanced Course on AI
- Organizer of ACAI 2011 Summer School on Automated Planning and Scheduling (with Michael Brenner, Bernhard Nebel and Gabriele Röger)

Workshops

- CAIR Workshop on Competitions in Artificial Intelligence and Robotics
- Organizer of CAIR 2009 (with Johan de Kleer, Lukas Kuhn and Paul E. Rybski)
- CP4PS Workshop on Problem Solving using Classical Planners
- PC member of CP4PS 2012
- GRAPHite Workshop on GRAPH Inspection and Traversal Engineering
- PC member of GRAPHite 2012
- HSDIP Workshop for Heuristics and Search for Domain-Independent Planning
- Organizer of HSDIP 2013 (with Gabriele Röger, Jordan T. Thayer and Michael Katz)
 - Organizer of HSDIP 2012 (with Patrik Haslum, Erez Karpas, Carlos Linares López, Gabriele Röger, Jordan Thayer and Rong Zhou)
 - Organizer of HSDIP 2009 (with Carmel Domshlak and Jörg Hoffmann)
 - Organizer of HSDIP 2007 (with Blai Bonet, Carmel Domshlak, Héctor Geffner, Patrik Haslum, Jörg Hoffmann and Vincent Vidal)
- MCTS Workshop on Monte-Carlo Tree Search: Theory and Applications
- PC member of MCTS 2011
- PlanSOpt Workshop on Planning, Search, and Optimization
- PC member of PlanSOpt 2015

PuK Workshop Planen, Scheduling und Konfigurieren, Entwerfen
(*Planning, Scheduling and Configuration, Design*)
◦ Local arrangements chair of PuK 2002

WIPC Workshop on the International Planning Competition
◦ Organizer of WIPC 2007
(with Minh Binh Do, Alan Fern and Ioannis Refanidis)
◦ PC member of WIPC 2012

Other

IPC International Planning Competition
◦ Organizer of IPC 2008, Deterministic Part
(with Minh Binh Do and Ioannis Refanidis)
◦ IPC committee member (since 2009)
◦ advisory committee member for IPC 2011

Teaching

Evaluation results for all courses are available on request.

Teaching at University of Basel

- Fall 2017 Lecture “Planning and Optimization”
(with Gabriele Röger)
- Fall 2017 Seminar “Recreational Computer Science from Langton’s Ant
to Turing’s Subway” (with Gabriele Röger)
- Spring 2017 Lecture “Foundations of Artificial Intelligence”
(with Gabriele Röger)
◦ nominated for *University of Basel Teaching Excellence Awards 2017*
in the category “Top Aktuell” (cutting edge)
- Spring 2017 Lecture “Theorie der Informatik”
(Theory of Computer Science)
◦ nominated for *University of Basel Teaching Excellence Awards 2017*
in the category “Starke Fundamente” (strong foundations)
- Fall 2016 Lecture “Planning and Optimization”
(with Gabriele Röger)
- Spring 2016 Lecture “Grundlagen der Künstlichen Intelligenz”
(Foundations of Artificial Intelligence; with Martin Wehrle)
- Spring 2016 Lecture “Theorie der Informatik”
(Theory of Computer Science)
- Fall 2015 Seminar and Project “Search and Optimization”
(with Martin Wehrle)
- Spring 2015 Lecture “Grundlagen der Künstlichen Intelligenz”
(Foundations of Artificial Intelligence)
- Spring 2015 Lecture “Theorie der Informatik”
(Theory of Computer Science; with Gabriele Röger)
- Fall 2014 Seminar and Project “Search and Optimization”
(with Gabriele Röger)

- Fall 2014 Seminar and Project “Open-Source-Softwareentwicklung”
(Open Source Software Development; with Jendrik Seipp)
- Spring 2014 Lecture “Grundlagen der Künstlichen Intelligenz”
(Foundations of Artificial Intelligence)
 - nominated for *Credit Suisse Award for Best Teaching*
- Spring 2014 Lecture “Theorie der Informatik”
(Theory of Computer Science; with Gabriele Röger)
- Fall 2013 Seminar and Project “Search and Optimization”
- Spring 2013 Lecture “Grundlagen der Künstlichen Intelligenz”
(Foundations of Artificial Intelligence)
- Spring 2013 Lecture “Theorie der Informatik”
(Theory of Computer Science; with Christian Tschudin)
- Fall 2012 Seminar and Project “Search and Optimization”
- Spring 2012 Lecture “Grundlagen der Künstlichen Intelligenz”
(Foundations of Artificial Intelligence)
- Spring 2012 Lecture “Theorie der Informatik”
(Theory of Computer Science; with Christian Tschudin)
- Spring 2010 Lecture “Grundlagen der Künstlichen Intelligenz” (Foundations of Artificial Intelligence; with Wolfram Burgard, Bernhard Nebel and Volker Roth)
- Spring 2009 Lecture “Grundlagen der Künstlichen Intelligenz” (Foundations of Artificial Intelligence; with Wolfram Burgard, Bernhard Nebel and Volker Roth)
- Summer 2007 Lecture “Grundlagen der Künstlichen Intelligenz” (Foundations of Artificial Intelligence; with Wolfram Burgard and Bernhard Nebel)
- Summer 2006 Lecture “Grundlagen der Künstlichen Intelligenz” (Foundations of Artificial Intelligence; with Wolfram Burgard and Luc De Raedt)

Teaching at University of Freiburg

For brevity, this list only includes teaching activities in the lecturer (for lectures) or main organizer (for laboratories and seminars) role. Activities in a teaching assistant or seminar contributor role are omitted.

- Winter 2010/2011 Laboratory “Handlungsplanung”
(Artificial Intelligence Planning)
- Summer 2010 Lecture “Handlungsplanung”
(Principles of AI Planning; with Bernhard Nebel)
- Winter 2009/2010 Lecture “Theoretical Computer Science II”
(with Andreas Karwath)
- Summer 2009 Practical “Grundlagen der Künstlichen Intelligenz”
(Foundations of Artificial Intelligence)
- Winter 2008/2009 Lecture “Handlungsplanung”
(Principles of AI Planning)
- Summer 2008 Lecture “Principles of Knowledge Representation and Reasoning”
(with Bernhard Nebel and Stefan Wöflf)
- Winter 2007/2008 Lecture “Spieltheorie”
(Game Theory; with Bernhard Nebel)
- Winter 2007/2008 “Handlungsplanung und Modelchecking”
(AI Planning and Model Checking)

- Summer 2007 Lecture “Constraint-Satisfaction-Probleme”
(Constraint Satisfaction Problems; with Stefan Wöflf)
 - Winter 2006/2007 Lecture “Handlungsplanung”
(Principles of AI Planning; with Bernhard Nebel)
 - Summer 2003 Seminar “Spiele, Spieltheorie und Multiagentensysteme”
(Games, Game Theory and Multi-Agent Systems)
- [Teaching at Other Institutions](#)
- Summer 2013 Lecture “Heuristic Search in Artificial Intelligence”
at Ibn Sina School for Computer Science 2013
 - Summer 2012 Lecture “Computational Complexity”
at Ibn Sina School for Computer Science 2012
 - Winter 2001/2002 Lecture “Informatik 1” (Introduction to Computer Science)
at Berufsakademie Lörrach (with Stefan Edelkamp)

[Other Teaching Activities](#)

I am the initiator of the postgraduate seminar *Reading Group on Planning and Search*, which has been held weekly since May 2009. The reading group has originally been held at the University of Freiburg. Since June 2011, it has been held as a joint event of the University of Freiburg and the University of Basel, alternating between the two locations.

I was one of the main initiators (jointly with Thomas Nunninger) of the *Sommercampus* event, a grass-roots initiative to foster teaching and learning at the Faculty of Engineering at the University of Freiburg outside the regular curricula. Jointly with Thomas Nunninger and Janis Fehr, I did the bulk of the organization work for the six Sommercampus events in 2004–2009. The Baden-Württemberg ministry of education has recognized the Sommercampus with the *Landeslehrpreis 2006* (state teaching award), worth 40 000 EUR.

[Supervision of Ph.D. Students](#)

[As Supervisor: Ongoing](#)

- since 06/2016 Cedric Geissmann
- since 03/2015 Michael Barry
(as external Ph.D. student, supervised jointly with René Schumann)
- since 05/2014 Salomé Eriksson
- since 02/2014 Manuel Heusner
- since 03/2013 Jendrik Seipp
- since 11/2012 Silvan Sievers

[As Supervisor: Completed](#)

- 05/2017 Florian Pommerening, *New Perspectives on Cost Partitioning for Optimal Classical Planning*.
University of Basel, Switzerland.

- 03/2011 Silvia Richter, *Landmark-Based Heuristics and Search Control for Automated Planning*.
Griffith University, Brisbane, Australia.
(Jointly supervised with Abdul Sattar and Charles Gretton.)
- Winner of the CORE Distinguished Doctoral Dissertation award for the best Computer Science thesis produced in Australia during 2011.
 - Winner of the ICAPS Best Dissertation Award 2012.
 - Awarded with the Griffith University Chancellor's Medal 2011.

As External Reviewer/Examiner

- 10/2017 Simon Ståhlberg, *Methods for Detecting Unsolvable Planning Instances using Variable Projection*.
Linköping University, Sweden.
- 02/2017 Isabel Rosario Cenamor Guijarro,
Creating Planning Portfolios with Predictive Models.
Universidad Carlos III de Madrid, Spain.
- 12/2015 Fan Xie, *Exploration in Greedy Best-First Search for Satisficing Planning*.
University of Alberta, Edmonton, Canada.
- 12/2015 Fazlul Hasan Siddiqui, *Using Plan Decomposition for Continuing Plan Optimisation and Macro Generation*.
The Australian National University, Canberra, Australia.
- 06/2015 Álvaro Torralba Arias de Reyna,
Symbolic Search and Abstraction Heuristics for Cost-Optimal Planning.
Universidad Carlos III de Madrid, Spain.
- 09/2013 Bram Ridder, *Lifted Heuristics: Towards More Scalable Planning Systems*.
King's College London, United Kingdom.
- 05/2013 Hootan Nakhost, *Random Walk Planning: Theory, Practice, and Application*.
University of Alberta, Edmonton, Canada.
- 01/2013 Robert Mattmüller, *Informed Progression Search for Fully Observable Nondeterministic Planning*.
University of Freiburg, Germany.
- 09/2012 Peter Kissmann, *Symbolic Search in Planning and General Game Playing*.
University of Bremen, Germany.
- 02/2012 Erez Karpas, *Non-classical Heuristics for Classical Planning*.
Technion, Haifa, Israel.

Supervision of M.Sc. Students

At University of Basel: Ongoing

- since 10/2017 Simon Wallny
since 09/2017 Philipp Oldenburg

At University of Basel: Completed

- 06/2017 Đorđe Relić, *Learning Heuristic Functions Through Supervised Learning*.
02/2017 Daniel Federau, *Merge Strategies for Merge-and-Shrink Heuristics*.
08/2016 Samuel Bader, *Pathfinding with Trees*.
07/2016 Dario Maggi, *Combining Novelty-Guided and Heuristic-Guided Search*.

- 06/2016 Michaja Pressmar, *Analysing and Combining Static Pruning Techniques for Classical Planning Tasks*.
- 02/2016 Cedric Geissmann, *Learning Heuristic Functions in Classical Planning*.
- 01/2015 Patrick von Reth, *Empirical Evaluation of Search Algorithms for Satisficing Planning*.
- 06/2014 Sascha Scherrer, *Automatic Selection of Pattern Collections for Domain Independent Planning*.
- 05/2014 Lukas Beck, *A Case Study on the Search Topology of Greedy Best-First Search*.
- 03/2014 Salomé Simon, *A General LTL Framework for Describing Control Knowledge in Classical Planning*.
- 10/2013 Lorenzo Luisoni, *Efficient Computation of Landmarks with Relaxed Planning*.
- 08/2013 Manuel Heusner, *Action Pruning Through Under-approximation Refinement*.
- 07/2013 Gabriel Duss, *Computation of h^+ with Factored Planning*.
- 08/2012 Pat Mächler, *Pebbles in Motion – Polynomial Algorithms for Multi-Agent Path Planning Problems*.
- [Elsewhere: Completed](#)
- 01/2017 Erik Wacker. *Klassisches Planen mit zustandsabhängigen Aktionskosten mit und ohne Kompilierung*.
University of Freiburg. (As external reviewer, not supervisor.)
- 12/2012 Jendrik Seipp, *Counterexample-guided Abstraction Refinement for Classical Planning*. University of Freiburg.
- 11/2012 Manuela Ortlieb, *Pattern-Database-Heuristiken für nichtdeterministische Planungsprobleme unter partieller Beobachtbarkeit*.
University of Freiburg. (As external reviewer, not supervisor.)
- 04/2012 Yusra Alkhazraji, *Partial Order Reduction for Automated Planning*.
University of Freiburg.
- 04/2012 Silvan Sievers, *Implementation of the UCT Algorithm for Doppelkopf*.
University of Freiburg.
- 12/2011 Florian Pommerening, *Optimal Planning for Delete-free Tasks with Incremental LM-cut*. University of Freiburg.
- 07/2011 Tansel Uras. *Applications of AI planning in genome rearrangement and in multi-robot systems*.
Sabancı University, Istanbul, Turkey. (As external reviewer, not supervisor.)
- 05/2009 Jens Witkowski, *Truthful Feedback for Reputation Mechanisms*.
Diplomarbeit, University of Freiburg.
- 04/2009 Stefan Schleipen, *Problemvereinfachung für numerische Planungsprobleme*.
Diplomarbeit, University of Freiburg.
- 02/2009 Christoph Betz, *Komplexität und Berechnung der h^+ -Heuristik*.
Diplomarbeit, University of Freiburg.
- 07/2007 Dennis Jung, *Eine automatentheoretische Heuristik für klassische Planungsprobleme*. Diplomarbeit, University of Freiburg.
- 03/2007 Benjamin Lempp, *Algorithmen für teilerfüllendes Planen*.
Diplomarbeit, University of Freiburg.

- 01/2006 Michael Drescher, *Approximationseigenschaften von Transportproblemen in der Handlungsplanung*. Diplomarbeit, University of Freiburg.
- 04/2005 Uwe Zeisberger, *Pfadplanung unter Unsicherheit*. Diplomarbeit, University of Freiburg.
- 07/2003 Sebastian Kupferschmid, *Entwicklung eines Double-Dummy Skat Solvers mit einer Anwendung für verdeckte Skatspiele*. Diplomarbeit, University of Freiburg.

Supervision of B.Sc. Students

At University of Basel: Ongoing

- since 08/2017 Ferdinand Badenberg
- since 07/2017 Tim Steindel

At University of Basel: Completed

- 07/2017 Gian-Andrea Wetten, *Combining Novelty-Guided and Bounded Suboptimal Search*.
- 06/2017 Marvin Buff, *Solving Delete-Relaxed Planning Tasks by Using Cut Sets*.
- 06/2017 Samuel Hugger, *Landmark-based Meta Best-first Search*.
- 06/2017 Florian Spiess, *Depth-Bound Heuristics and Iterative-Deepening Search Algorithms in Classical Planning*.
- 03/2017 Daniel Killenberger, *Diversifying Greedy Best-First Search by Clustering States*.
- 02/2017 Marcel Neidinger, *Online Knowledge Enhancements for Monte Carlo Tree Search in Probabilistic Planning*.
- 01/2017 Kevin Grimm, *Under-Approximation Refinement for Timed Automata*.
- 01/2017 Alexander Steinacher, *Partition-Based Pruning for Classical Planning Revisited*.
- 12/2016 Andreas Ferenczi, *Berechnung von Potential-Heuristiken basierend auf Pattern-Datenbanken*.
- 12/2016 Severin Wyss, *A Formalism for Build Order Search in StarCraft Brood War*.
- 08/2016 Philipp Oldenburg, *Gibt es Sudokus mit nur 16 Vorgaben?*.
- 08/2016 Simon Wallny, *Symbolische Zustandsraumsuche mit Sentential Decision Diagrams*.
- 06/2016 Patrick Zumsteg, *Komprimierte Pfaddatenbanken durch Lauflängenkodierung von optimal permutierten first-move Matrizen*.
- 02/2016 Maximilian Linus Grüner, *Abstractions in probabilistic planning*.
- 01/2016 Raphael Imahorn, *P^m -Kompilierung von Planungsaufgaben im Fast-Downward Planungssystem als alternative Berechnung der h^m -Heuristik*.
- 07/2015 Andreas Thüring, *Evaluation of Regression Search and State Subsumption in Classical Planning*.
- 02/2015 Patrik Dürrenberger, *Solving the Traveling Tournament Problem with Heuristic Search*.
- 01/2015 Daniel Federau, *Tunnel-Based Pruning for Classical Planning*.
- 08/2014 Lukas Songajlo, *Kontext-basierte Suche für klassische Handlungsplanung*.

- 08/2014 Dietrich Zerr, *Generating and Evaluating Unsolvable STRIPS Planning Instances for Classical Planning.*
- 12/2013 Beat Hänger, *Phase Transitions in the Solvability of Sokoban.*
- 07/2013 Stefano Branco, *Iterative Tunneling A* in Planning.*
- 06/2013 Manuela Lütolf, *A Learning AI for the game Risk using the TD(λ)-Algorithm.*
- 06/2013 Claudio Alexander Marxer, *An Algorithm for Avoiding Plateaus in Heuristic Search.*
- 10/2012 Lukas Beck, *Optimal Policies for the Canadian Traveler's Problem.*
- 08/2012 Pier Paolo Bortoluzzi, *A Pattern Database Approach for Solving the TopSpin Puzzle Problem.*
- 07/2012 Sascha Scherrer, *An algorithm for computing bisimulations in planning.*
- 07/2012 Salomé Simon, *CSP- and SAT-based Inference Techniques Applied to Gnomine.*
- 07/2012 Matthias Solèr, *Refining abstraction heuristics with mutexes.*
- 07/2012 Arthur Toenz, *Search methods for general permutation problems.*
- 06/2012 Simon Wang, *Construction of Pattern Database Heuristics using Cost Partitioning.*
- 11/2011 Manuel Heusner, *UCT for Pac-Man.*
- [Elsewhere: Completed](#)
- 12/2011 Tilman Thiry, *Implementierung der Merge-And-Shrink-Heuristik für Nicht-deterministisches Planen.*
University of Freiburg. (As external reviewer, not supervisor.)
- 09/2009 Jendrik Seipp, *Fluent Merging für klassische Planungsprobleme.*
University of Freiburg.
- 10/2009 Silvan Sievers, *Erweiterung eines Planungssystems zum Lösen von Ein-Personen-Spielen.*
University of Freiburg. (As reviewer, not supervisor.)
- 09/2009 Diana Hille, *Analyse des SGPlan.*
University of Freiburg.
- 09/2009 Jonas Sternisko, *Einfluss der Finite-Domain-Repräsentation auf die Performance von Planungssystemen.*
University of Freiburg. (As reviewer, not supervisor.)
- 05/2008 David Goergen, *Kompakte Kodierungen monotoner boolescher Funktionen.*
University of Freiburg.