

ADI BOTEA

CONTACT AND PERSONAL INFORMATION

NICTA, Canberra Research Laboratory
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Australia
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Citizenship: Romanian, Canadian.

AFFILIATIONS

- NICTA; Canberra Research Laboratory; Managing Complexity Theme
- Australian National University; School of Computer Science; Artificial Intelligence Group

MAIN RESEARCH INTERESTS

AI planning, heuristic search, search methods for optimization problems, path planning, constraint programming, AI in games

HIGHLIGHTS

- PhD degree in computer science (thesis defended in 2005)
- Extensive research, project development and programming experience
- Excellent written and oral communication skills
- More than 20 peer-reviewed scientific articles published in top international journals, conferences and symposia
- Best paper award in the International Competition on Automated Planning and Scheduling ICAPS-09
- Co-author of HPA*, described on the AiGameDev.com website as “arguably [...] the most popular hierarchical path-finding implementation in the video games industry” (<http://aigamedev.com/premium/articles/static-hierarchical-pathfinding/>). “Near Optimal Hierarchical Path-Finding”, our paper on HPA*, is cited 90 times.
- Student supervision experience up to the PhD level
- Member of the Editorial Board of the Journal of AI Research

- Member of the Programme Committee of AAAI, IJCAI, ICAPS, ECAI and other international conferences
- Numerous talks as conference presentations, course lectures or tutorials

EDUCATION

- 09/2000–10/2005 Ph.D. Program, Department of Computing Science, University of Alberta, Canada.
 Topic: Improving planning and search with automatic abstraction.
 Advisors: Prof. Jonathan Schaeffer and Prof. Martin Müller
- 10/1997–06/1998 M.Sc. Program, Department of Computing Science, Faculty of Mathematics, University of Bucharest, Romania.
 Topic: A neuro-fuzzy architecture to assist in driving a car.
 Advisor: Prof. Luminita State.
- 10/1992–06/1997 B.Sc. Program, Department of Computing Science, Faculty of Mathematics, University of Bucharest, Romania.
 Advisor: Prof. Luminita State.

EMPLOYMENT HISTORY

- 07/2009–present Senior Researcher at NICTA
- 05/2006 – present Adjunct Researcher at the Australian National University
- 07/2010–09/2010 Short-term Research Intern at Microsoft Research, Constraint Reasoning Group, Cambridge, UK
- 05/2006–07/2009 Researcher at NICTA
- 11/2005–04/2006 Post Doctoral Position, Department of Computing Science, University of Alberta
- 09/2000–10/2005 PhD Student, Department of Computing Science, University of Alberta
- 2000 Software Developer at Algoritma Ltd., Bucharest, Romania
- 1999 Software Developer at Omnis Group Ltd., Bucharest, Romania

PUBLICATIONS

2010

- Harabor D., Botea A. 2010. Breaking Path Symmetries in 4-connected Grid Maps. In *Proceedings of the AI and Interactive Digital Entertainment Conference AIIDE-2010*, Stanford University, Palo Alto, CA, USA.

- Wang K-H. C., Botea A. 2010. Scalable Multi-Agent Pathfinding on Grid Maps with Tractability and Completeness Guarantees. In *Proceedings of the European Conference on AI ECAI-2010*, Lisbon, Portugal. Short paper.
- Kishimoto A., Fukunaga A. and Botea A. 2010. On the Scaling Behavior of HDA*. In *Proceedings of the Third Annual Symposium on Combinatorial Search SoCS-2010*, Stone Mountain, Atlanta, GA, USA. Research summary.
- Periorellis P., Botea A. and Bordeaux L. 2010. Orchestrated Management: A Method for Enhancing the Management Process and Experience of System Center Products and their Administrators. *Microsoft Think Week Paper*.

2009

- Kishimoto A., Fukunaga A. and Botea A. 2009. Scalable, Parallel Best-First Search for Optimal Sequential Planning. In *Proceedings of the International Conference on Automated Planning and Scheduling ICAPS-09*, Thessaloniki, Greece. **Best paper award.**
- Baier J. and Botea A. 2009. Improving Planning Performance Using Low-Conflict Relaxed Plans. In *Proceedings of the International Conference on Automated Planning and Scheduling ICAPS-09*, Thessaloniki, Greece.
- Wang K-H. C., Botea A. 2009. Tractable Multi-Agent Path Planning on Grid Maps. In *Proceedings of the International Joint Conference on Artificial Intelligence IJCAI-09*, Pasadena, CA, USA.
- Botea A., Ciré A. 2009. Decentralized Planning with Temporally Extended Goals and Uncontrollable Events. In *Proceedings of the International Joint Conference on Artificial Intelligence IJCAI-09*, Pasadena, CA, USA.
- Botea A., Anbulagan. 2009. Analyzing the Behaviour of Crossword Puzzles. In *Proceedings of the Symposium on Combinatorial Search SoCS-09*, Lake Arrowhead, CA, USA.
- Kishimoto A., Fukunaga A. and Botea A. 2009. Parallel Best-First Search for Optimal Sequential Planning (Research Statement). In *Proceedings of the Symposium on Combinatorial Search SoCS-09*, Lake Arrowhead, California, USA.

2008

- Wang K-H. C., Botea A. 2008. Fast and Memory-Efficient Multi-Agent Pathfinding. In *Proceedings of the International Conference on Automated Planning and Scheduling ICAPS-08*, 380–387, Sydney, Australia.

- Ciré A., Botea A. 2008. Learning in Planning with Temporally Extended Goals and Uncontrollable Events. In *Proceedings of the European Conference on Artificial Intelligence ECAI-08*, 578–582, Patras, Greece.
- Anbulagan, Botea A. 2008. Crossword Puzzles as a Constraint Problem. In *Proceedings of the International Conference on Principles and Practice of Constraint Programming CP-08*, 550–554, Sydney, Australia.
- Kelly J. P., Botea A., Koenig S. 2008. Offline Planning with Hierarchical Task Networks in Video Games. In *Proceedings of the International Conference on Artificial Intelligence and Interactive Digital Entertainment AIIDE-08*, Stanford, CA, USA.
- Harabor D., Botea A. 2008. Hierarchical Path Planning with Multi-Size Agents in Heterogenous Environments. In *IEEE Symposium on Computational Intelligence and Games CIG-08*, 258–265, Perth, Australia.
- Botea A., Linares C., editors. 2008. *Proceedings of the ECAI-08 Workshop on AI in Games AIG-08*, Patras, Greece.

2007

- Botea A., Müller M., Schaeffer J. 2007. Fast Planning with Iterative Macros. In *Proceedings of the International Joint Conference on Artificial Intelligence IJCAI-07*, 1828–1833, Hyderabad, India.
- Hashum P., Bonet B., Helmert M., Botea A., Koenig S. 2007. Domain-Independent Construction of Pattern Database Heuristics for Cost-Optimal Planning. In *Proceedings of the 22nd National Conference on Artificial Intelligence AAAI-07*, Vancouver, Canada.
- Botea A., 2007. Crossword Grid Composition with A Hierarchical CSP Encoding. In *Proceedings of the CP-07 Workshop ModRef-07*, Providence, Rhode Island, USA.
- Kelly J. P., Botea A., Koenig S., 2007. Planning with Hierarchical Task Networks in Video Games. In *Proceedings of the ICAPS-07 Workshop on Planning in Games*, Providence, Rhode Island, USA.

2006

- Botea A. 2006. Improving Planning and Search with Automatic Abstraction. *PhD Thesis*. University of Alberta.
- Botea A., Buffet O., Zanella M., editors, 2006. *Proceedings of the ECAI-06 Workshop on Planning, Learning and Monitoring with Uncertainty and Dynamic Worlds*, Riva del Garda, Italy.

2005

- Botea A., Enzenberger M., Müller M., Schaeffer J. 2005. Macro-FF: Improving AI Planning with Automatically Learned Macro-Operators. In *Journal of Artificial Intelligence Research*, volume 24, 581–621.
- Botea A., Müller M., Schaeffer J. 2005. Learning Partial-Order Macros from Solutions. In *Proceedings of the Fifteenth International Conference on Automated Planning and Scheduling ICAPS-05*, 231–240, Monterey, CA, USA.

2002–2004

- Botea A., Müller M., Schaeffer J. 2004. Near Optimal Hierarchical Path-Finding. In *Journal of Game Development*, volume 1, issue 1, 7–28.
- Botea A., Müller M., Schaeffer J. 2004. Using Component Abstraction for Automatic Generation of Macro-Actions. In *Proceedings of the Fourteenth International Conference on Automated Planning and Scheduling ICAPS-04*, 181–190, Whistler, BC, Canada.
- Botea A., Müller M., Schaeffer J. 2002. Using Abstraction for Planning in Sokoban. In *Proceedings of the Third International Conference on Computer and Games CG-02*, volume 2883 of Lecture Notes in Artificial Intelligence, 360–375, Edmonton, AB, Canada.
- Botea A., Müller M., Schaeffer J. 2003. Extending PDDL for Hierarchical Planning and Topological Abstraction. In *Proceedings of the ICAPS-03 Workshop on PDDL*, 25–32, Trento, Italy.
- Botea A., Enzenberger M., Müller M., and Schaeffer J. 2004. Macro-FF. In *Booklet of 4th International Planning Competition*, 15–17.
- Botea A. 2003. Reducing Planning Complexity with Topological Abstraction. In *Proceedings of the ICAPS-03 Doctoral Consortium*, 11–15, Trento, Italy.
- Botea A. 2002. Using Abstraction for Heuristic Search and Planning. Research Summary. In *Proceedings of the 5th International Symposium on Abstraction, Reformulation, and Approximation SARA-02*, volume 2371 of Lecture Notes in Artificial Intelligence, 326–327, Kananaskis, AB, Canada.

SUPERVISION EXPERIENCE

- Ko-Hsin Cindy Wang, current PhD student (since February 2008). Topic: Multi-agent path planning.
- Vasan Darani, former Honours student (2010). Topic: Path planning on grid maps. Joint supervision with Alban Grastien.

- Martin Bolanca, former Honours student (2009). Topic: Fast and optimal path planning through the use of macro-steps in obstacle-free areas.
- Daniel Damir Harabor, former Honours student (2007). Topic: Hierarchical path-planning with heterogenous agents and terrains. Joint supervision with Eric McCreath.
- John-Paul Kelly, former Honours student (2007). Topic: Online hierarchical planning in commercial computer games.
- Cindy Ko-Hsin Wang, former Honours student (2007). Topic: Avoiding collisions in multi-agent path-planning. Joint supervision with Eric McCreath.
- André Ciré, former visiting student from Brazil (February to April 2007). Topic: Planning with exogenous events and temporally extended goals.
- John-Paul Kelly, former summer student (November 2006 - January 2007). Topic: Hierarchical planning in commercial computer games. Joint supervision with Sven Koenig.
- Reuben Fletcher-Costin, former summer student (November 2006 - January 2007). Topic: Moving target search with hierarchical abstraction. Joint supervision with Sven Koenig.
- Member of the Thesis Committees of PhD students Joanna Cheng, Daniel Damir Harabor, Ben Swift.

SELECTED LECTURING EXPERIENCE

Jul 2009	IJCAI-09 Tutorial on Video Games and Artificial Intelligence. Co-authored with Thore Graepel and Ralf Herbrich, Microsoft Research, Cambridge, UK.
Feb 2009	Short course on Search and Games in the ANU/NICTA Summer School on Logic and Learning.
Fall 2009	Organizer and co-lecturer of the course COMP3620/6320 – Artificial Intelligence, offered at the Australian National University.
Fall 2008	Co-organizer and co-lecturer of the course COMP3620/6320 – Artificial Intelligence (at the Australian National University).
Fall 2007	Organizer and co-lecturer of the course COMP3620/6320 (at the Australian National University).
Winter 2006	Co-lecturer of the graduate course CMPUT654 – Planning in Artificial Intelligence, offered at the University of Alberta, Canada.

PROFESSIONAL, ACADEMIC AND ADMINISTRATIVE EXPERIENCE

- 2011 Senior PC member of the International Joint Conference on Artificial Intelligence IJCAI-11.
- 2011 PC member of the International Conference on Automated Planning and Scheduling ICAPS-11.
- 2010 Member of the Editorial Board of the Journal of AI Research JAIR.
- 2010 PC member of the International Conference on Automated Planning and Scheduling ICAPS-10.
- 2010 PC member of the National Conference on AI AAAI-10.
- 2010 PC member of the European Conference on AI ECAI-10.
- 2010 PC member of the AI and Interactive Digital Entertainment Conference AIIDE-10.
- 2010 PC member of the International Symposium on Combinatorial Search SoCS-10.
- 2009 PC member of the International Joint Conference on Artificial Intelligence IJCAI-09.
- 2009 PC member of the International Conference on Automated Planning and Scheduling ICAPS-09.
- 2009 Judge in the International Competition on Knowledge Engineering for Planning and Scheduling ICKEPS-09.
- 2009 PC member of the International Symposium on Abstraction, Reformulation and Approximation SARA-09.
- 2009 PC member of the International Symposium on Combinatorial Search SoCS-09.
- 2009 Mentor in the ICAPS-09 Doctoral Consortium.
- 2009 PC member of the IJCAI-09 Workshop on Learning Structural Knowledge from Observations STRUCK-09.
- 2008 PC member of the National Conference on AI AAAI-08.
- 2008 PC member of the International Conference on Automated Planning and Scheduling ICAPS-08.
- 2008 Member of the ICAPS-08 Organizing Committee, in charge with local organization.

2008	Co-chair of the ECAI Workshop on AI in Games AIG-08.
2008	PC member of the Australian Conference on Artificial Intelligence AI-08.
2008	PC member of IBERAMIA-08.
2008	Mentor in the ICAPS-08 Doctoral Consortium.
2007	PC member of ICAPS-07.
2007	Publicity co-chair of ICAPS-07.
2007	PC member of AI-07.
2007	Mentor in the ICAPS-07 Doctoral Consortium.
2006	Co-chair of the ECAI-06 Workshop on Planning, Learning and Monitoring with Uncertainty and Dynamic Worlds.
2005	PC member for the IJCAI-05 Workshop on Planning and Learning in A Priori Unknown or Dynamic Domains.
2003–present	Reviewer for Artificial Intelligence Journal, Journal of Artificial Intelligence Research, Journal of Heuristics, IEEE Transactions on Computational Intelligence and AI in Games, Journal of Genetic Programming and Evolvable Machines, IJCAI-07, AAAI-06 Student Abstract Program, Australian Joint Conference on Artificial Intelligence 2006, International Conference on Control, Automation, Robotics and Vision ICARCV-06, 14th International Conference on Automated Planning and Scheduling ICAPS-04, 19th National Conference on Artificial Intelligence AAAI-04, 4th International Conference on Computers and Games CG-04, and 10th Advances in Computer Games Conference.

AWARDS AND HONORS

09/2009	Best paper award in the International Competition on Automated Planning and Scheduling ICAPS-09.
03/2006	Finalist for outstanding Ph.D. thesis award, Department of Computing Science, University of Alberta, Canada.
02/2004–05/2004	Entered the 4th International Planning Competition and took first place in 3 out of 7 domains where competed.
09/2004–08/2005	Dissertation Fellowship (University of Alberta).
05/2004	Andrew Stewart Memorial Graduate Prize (University of Alberta).

- 09/2000–08/2004 FS Chia PhD Scholarship (University of Alberta).
- 06/1998 Finished the M.Sc. program with the best GPA (98%) in the class of 1998 (University of Bucharest).
- 10/1992–06/1998 Undergraduate and Graduate Scholarships (University of Bucharest).
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SELECTED PRESENTATIONS

- 07/2009 “Heuristic Incremental Search for Planning with Temporally Extended Goals and Uncontrollable Events.” International Joint Conference on AI IJCAI-09, Pasadena, CA, USA.
- 07/2009 “Planning with Temporally Extended Goals and Uncontrollable Events.” INRIA Labs in Rennes, Paris and Toulouse, France.
- 07/2009 “Analysing the Behaviour of Crosswords Puzzles.” Symposium on Combinatorial Search, Lake Arrowhead, CA, USA.
- 07/2008 “Learning in Planning with Temporally Extended Goals and Uncontrollable Events.” European Conference on AI, Patras, Greece.
- 01/2007 “Fast Planning with Iterative Macros.” International Joint Conference on Artificial Intelligence, Hyderabad, India.
- 11/2006 “Fast Planning with Iterative Macros.” University of Alberta, Canada.
- 10/2005 “Fast Planning with Macro-Operators.” University of New South Wales, Sydney, Australia.
- 09/2005 “Speeding Up Planning with Automatic Abstraction.” NICTA, Canberra, Australia.
- 06/2005 “Learning Partial-Order Macros from Solutions.” 15th International Conference on Automated Planning and Scheduling ICAPS-05, Monterey, CA, USA.
- 06/2004 “Using Component Abstraction for Automatic Generation of Macro-Actions.” 14th International Conference on Automated Planning and Scheduling ICAPS-04, Whistler, BC, Canada.