

Name: **Carla Gomes**

Title: Associate Professor

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University Activities

- Director of the Institute for Computational Sustainability (ICS)
- Director of the Intelligent Information Systems Institute (IISI) (2001-2008)
- Member, Diversity and Leadership Committee, Cornell University
- Member, Committee on Support of Teaching and Learning (CSTL) (2004-2008)
- Hans Bethe House Fellow

Professional Activities

- Director of the Institute for Computational Sustainability
- Program Co-chair, 1st International Conference on Computational Sustainability (CompSust09), 2009.
- Program Co-chair, Twenty-Third Conference on Artificial Intelligence (AAAI-08), 2008.
- Member, Awards Committee, American Association of the Advancement of Artificial Intelligence. 2008, 2009.
- Program Committee AAAI-07,
- Program Committee CPAIOR-09
- Program Committee IJCAI-09

Publications

- A generative power-law search tree model. Alda Carvalho, Nuno Crato, and Carla Gomes. Computers and Operations Research, Volume 36, Issue 8, 2009.
- Learning Optimal Subsets with Implicit User Preferences. Yunsong Guo and Carla Gomes. 21st Int. Joint Conf. on Artificial Intelligence (IJCAI-09), Pasadena, CA, 2009.
- Ranking Structured Documents: A Large Margin Based Approach for Patent Prior Art Search. Yunsong Guo and Carla Gomes. 21st Int. Joint Conf. on Artificial Intelligence (IJCAI-09), Pasadena, CA, 2009.
- Integrating Systematic and Local Search Paradigms: A New Strategy for MaxSAT. Lukas Kroc, Ashish Sabharwal, Carla P. Gomes, and Bart Selman. 21st Int. Joint Conf. on Artificial Intelligence (IJCAI-09), Pasadena, CA, 2009.
- Backdoors in the Context of Learning. Bistra Dilkina, Carla P. Gomes, Ashish Sabharwal. 12th Int. Conf. on Theory and Applications of Satisfiability Testing, (SAT-09), UK, 2009.
- Backdoors to Combinatorial Optimization: Feasibility and Optimality. Bistra Dilkina, Carla P. Gomes, Yuri Malitski, Ashish Sabharwal, Meinolf Sellmann. Int. Conf. on the Integration of AI and OR Techniques (CPAIOR-09), Pittsburgh, USA, 2009.

- Model Counting. Carla Gomes, Ashish Sabharwal, and Bart Selman. Handbook of Satisfiability (inv. chapter), IOS Press, 2009.
- Exploiting Runtime Variation in Complete Solvers. Carla P. Gomes and Ashish Sabharwal. Handbook of Satisfiability (inv. chapter), IOS Press, 2009.
- Connections in Networks: A Hybrid Approach. Carla P. Gomes, Willem Jan van Hoeve, and Ashish Sabharwal. 5th Int. Conf. on the Integration of AI and OR Techniques (CPAIOR-08), Paris, France, 2008.
- Proceedings of the Twenty-Third AAAI Conference on Artificial Intelligence. Dieter Fox and Carla P. Gomes (Eds.) AAAI 2008, Chicago, Illinois, USA, July 13-17, AAAI Press 2008.
- Satisfiability Solvers. Carla Gomes, Henry Kautz, Ashish Sabharwal, and Bart Selman. Handbook of Knowledge Representation (inv. chapter), Elsevier, 2008.
- Structure and Problem Hardness: Goal Asymmetry and DPLL Proofs in SAT-Based Planning. Joerg Hoffmann, Carla P. Gomes, and Bart Selman. Logical Methods in Computer Science 3(1): 2007.
- Regular-SAT: A many-valued approach to solving combinatorial problems. Ramón Béjar, Felip Manyà, Alba Cabiscol, Cèsar Fernández, and Carla P. Gomes. Discrete Applied Mathematics 155(12): 1613-1626, 2007.
- The Science of Constraints. Carla Gomes and Bart Selman. Constraint Programming Letters, 1:15--20, 2007.
- From Sampling to Model Counting Carla Gomes, Joerg Hoffmann, Ashish Sabharwal, and Bart Selman. 20th Int. Joint Conference on Artificial Intelligence (IJCAI-07), Hyderabad, India, 2007.
- SAT Encodings of State-Space Reachability Problems in Numeric Domains. Joerg Hoffmann, Carla P. Gomes, Bart Selman, and Henry A. Kautz. 20th Int. Joint Conference on Artificial Intelligence (IJCAI-07), Hyderabad, India, 2007.
- Optimal Multi-Agent Scheduling with Constraint Programming. Willem Jan van Hoeve, Carla P. Gomes, Bart Selman, and Michele Lombardi. 22nd Conf. on Artificial Intelligence (AAAI-07), Vancouver, BC, Canada, 2007.
- Counting CSP Solutions Using Generalized XOR Constraints. Carla Gomes, Willem-Jan van Hoeve, Ashish Sabharwal, and Bart Selman. 22nd Conf. on Artificial Intelligence (AAAI-07), Vancouver, BC, Canada, 2007.
- The Impact of Network Topology on Pure Nash Equilibria in Graphical Games. Bistra Dilkina, Carla P. Gomes, Ashish Sabharwal. 22nd Conf. on Artificial Intelligence (AAAI-07), Vancouver, BC, Canada, 2007.
- Tradeoffs in the Complexity of Backdoor Detection. Bistra Dilkina, Carla P. Gomes, Ashish Sabharwal. 13th International Conference on Principles and Practice of Constraint Programming (CP07), LNCS volume 4741, ppProvidence, RI, Sep 2007.
- Connections in Networks: Hardness of Feasibility versus Optimality. Jon Conrad, Carla P. Gomes, Willem-Jan van Hoeve, Ashish Sabharwal, Jordan Suter. Int. Conf. on the Integration of AI and OR Techniques (CPAIOR-07), Brussels, Belgium, 2007.

- Sampling and Soundness: Can We Have Both? Carla P. Gomes, Joerg Hoffmann, Ashish Sabharwal, Bart Selman 6th International Semantic Web Conference (ISWC-07), Busan, Korea, 2007.
- Short XORs for Model Counting: From Theory to Practice. Carla P. Gomes, Joerg Hoffmann, Ashish Sabharwal, and Bart Selman. 10th Int. Conf. on Theory and Applications of Satisfiability Testing (SAT-07). Lisbon, Portugal, 2007.
- Structure and Problem Hardness: Goal Asymmetry and DPLL Proofs in SAT-Based Planning. Joerg Hoffmann, Carla P. Gomes, and Bart Selman. CoRR abs/cs/0701184: 2007.

Lectures

- "Computational Sustainability: Computational Methods for a Sustainable Future" National Academy of Engineering, U.S. Frontiers of Engineering, 2009.
- "Computational Sustainability: Computational Methods for a Sustainable Future" Invited Plenary Talk, Intl. Conference on the Principles and Practice of Constraint Programming (CP09), 2009.
- "Exploiting Structure and Randomization in Combinatorial Search" Colloquium, Tepper Business School, CMU, 09.
- "Bridging the Gap Between Theory and Practice in Combinatorial Search" Afosr PI Meeting, Washington, 2009.
- "Computational Sustainability: Computational Methods for a Sustainable Future" NSF Advisory Board (CISE), Washington, 2008.
- "Synergies between Computer Science, Operations Research, and Physics in the Study of Combinatorial Problems" Afosr PI Meeting, Washington, 2007.
- "Beyond Satisfiability: Model Counting, Quantification, Randomization" Symposium on Satisfiability Solvers and Program Verification, DOD, Washington, 2007.
- "Computational Sustainability: A new Emerging Research Area" New Directions in Software Technology (NDIST), 2007.
- "Coin Flipping for Satisfaction, Optimization, and Beyond" Colloquium, Faculty of Engineering, University of Porto, Portugal, 2007.
- "Hidden Structure in Combinatorial Problems" Informs, Seattle, 2007
- "Typical Case Complexity in Combinatorial Search" Informs, San Juan, May 2007
- "Quantified Boolean Formula (QBF) Reasoning," (with Ashish Sabharwal and Bart Selman) Tutorial prepared for DARPA, Washington, DC, Feb. 2007

New Honors

- Lead P.I., NSF Expeditions on Computing Award (\$10M).
- Computational Sustainability: Computational Methods for a Sustainable Environment, Economy, and Society, 2008.
- Program Co-chair of Twenty-Third Conference on Artificial Intelligence (AAAI-08), 2008.
- Fellow, Association for the Advancement of Artificial Intelligence, (elected in 2007).
- Program Co-Chair, Ninth Intl. Conference on Theory and Applications of Satisfiability Testing (SAT 2006), 2006.

- Best Paper Award, "Model counting: A new strategy for obtaining good bounds," Proceedings of the Twenty-first National Conference on Artificial Intelligence, 2006.
- Distinguished paper award. "Statistical Regimes Across Constrainedness Regions", International Conference on the Principles and Practice of Constraint Programming (CP-2004), 2004.
- Elected to the Executive Council of the American Association for Artificial Intelligence (AAAI), 2001-2005.
- Conference Chair for the Intl. Conference on the Principles and Practice of Constraint Programming (CP-2002), 2002.
- Invited Plenary Talk, "Structure, Duality, and Randomization —Common Themes in AI and OR," 17th Natl. Conf. on Artificial Intelligence (AAAI-00), 2000.
- Member, Advisory Committee, International Scientists, for the Research Council President of the European Union, 2000.
- Special Recognition Award, Information Directorate, Air Force Research Laboratory, 1999.
Citation: Dr. Carla P. Gomes is recognized for her ground-breaking research in integrating Artificial Intelligence and Operations Research techniques which led to a "boosted" search method that allowed several orders of magnitude speedups for solving hard, real-world problems.
- Nominated for the General Ronald Yates Award for Excellence in Technology Transfer (AFRL/RL), 1996.

Other/Misc.

- Constraint Journal
- Constraint Processing Letters
- Journal of Satisfiability