

Weixiong Zhang

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Professional Experience

- *Professor* (6/2007 – present) Department of Computer Science and Engineering, Washington University in St. Louis, St. Louis, MO, USA
- *Professor* (1/2008 – present) Department of Genetics, Washington University School of Medicine, St. Louis, MO, USA
- *Associate Professor* (8/2000 – 5/2007) Department of Computer Science and Engineering, Washington University in St. Louis, St. Louis, MO, USA
- *Associate Professor* (7/2001 – 12/2007) Department of Genetics, Washington University School of Medicine, St. Louis, MO, USA
- *Research Assistant Professor* (5/1995 – 8/2000) Computer Science Department, University of Southern California, Los Angeles, CA, USA
- *Senior Research Scientist* (10/1994 – 8/2000) Information Sciences Institute, University of Southern California, Los Angeles, CA, USA

Education

- *Ph.D.* in Computer Science, University of California, Los Angeles (UCLA) (6/1994)
- *M.S.* in Computer Science, University of California, Los Angeles (UCLA) (11/1991)
- *M.S.* in Computer Engineering, Tsinghua University, Beijing, China (3/1986)
- *B.S.* in Computer Engineering, Tsinghua University, Beijing, China (6/1984)

Honors / Awards

- *Henning Anderson Price* for the highest rated basic abstract at the European Society for Paediatric Endocrinology 51st Annual Meeting. (from 1,012 abstracts by a double-blind review)
- *Outstanding Paper Award*, The AAAI National Conference on Artificial Intelligence, Atlanta, GA, July, 11-15, 2010. (from 984 submissions by a double-blind review)
- *First Place Award*, Optimal Planning Track of the Fifth International Planning Competition, hosted at *The 16th International Conference on Automated Planning and Scheduling (ICAPS 2006)*, June 6-10, English Lake District, Cumbria, UK. (2006)
- *Best Paper Award*, A multi-agent operator interface for unmanned aerial vehicles, *The 18th AIAA Digital Avionics Systems Conference*, St. Louis, MO, October 24-29 (1999)
- Paper at International Conference on Multi-Agent Systems (ICMAS-98) selected to *Autonomous Agents and Multi-Agent Systems* special issue of *Best of ICMAS-98* (1998)
- *UCLA Chancellor's Dissertation Fellowship*, UCLA (1993– 1994)
- *GTE Graduate Fellowship*, GTE Corporation (1992– 1993)
- *Student Author Scholarships*, National Association on AI (1992, 1993, 1994)
- *Graduate Fellowship*, UCLA (1990– 1992)

Professional Service – Editorial Duties

- *PLoS Computational Biology*, Deputy Editor, 2011 – present; Associate Editor, 2008 – 2011.
- *Biology Direct*, Editorial Board Member, 2013 – present.
- *Artificial Intelligence*, Associate Editor, 2009 – 2015; Editorial Board Member, 2007 – 2015
- *Artificial Intelligence Communication – The European Journal on Artificial Intelligence*, Associate Editor, 2004 – present.
- *Scientific Reports* (by Nature Publishing Group), Editorial Board Member in the area of molecular biology, 2015 – 2016. (resigned in January, 2016, due to different opinions on publication policies)
- *Journal of Alzheimer's Disease*, Associate Editor, 2009 – 2012.
- *Journal of Artificial Intelligence Research*, Editorial Board Member, 2005 – 2009.
- *The Open Systems Biology Journal*, Advisory Board Member, 2008 – 2010.3; resigned in 2010.3.
- Guest Editor, *Artificial Intelligence* special issue on *Heuristic Search*, vol.129, no.1-2, 2001.
- Book Editor, *Distributed Constraint Problem Solving and Reasoning in Multi-agent Systems*, editors, Weixiong Zhang and Volker Sorge, IOS Press, 2004.
- Lecture Notes Editor, *Search Techniques for Problem Solving under Uncertainty and Incomplete Information*, editors, Weixiong Zhang and Sven Koenig, AAAI Press, 1999.

Keynote Speech, Invited Talks and Seminars, Tutorials and Presentations

- Plenary talk, Computational ncRNAomics: Accomplishments and challenges, *Symposium on Development and Applications of New Technologies and Methods for RNA Research*, Shanghai, China, Sept. 10-11, 2013, organized by Chinese Academy of Sciences.
- Invited talk, Sources, causes and consequences of microRNA isoforms, *The 4th Conf. on Technologies and Applications of small RNAs (RNAi China)*, June 20-23, Kunshan, Jiangsu, China.
- Keynote speech, Systems-biology approach to Alzheimer's disease, *IEEE Intern. Conf. on Systems Biology*, Zhuhai, China, Sept. 2-4, 2011
- Invited talk, Transcriptome analysis to identify plant microRNAs responding environmental stress. *International Bioinformatics Workshop (IBW-2011)*, Xi'an, China, July 7-10,
- Keynote speech, Where microRNAs originate, *The Annual National Conference of Chinese RNA Society*, Guangzhou, China, Oct. 19-20, 2010.
- Invited talk, A steganographic approach to genome-wide motif finding and its applications, *ISMB-2010/Bioinformatics for Regulatory Genomics Special Interest Group Meeting*, Boston, MA, July 10, 2010.
- Invited talk, Identification of cis-element modules and characterization of their roles in tissue- and stress-specific gene expression regulation, *The 9th International Plant Molecular Biology Congress Symposium on Transcription Factors*, St. Louis, MO, Oct. 30, 2009.
- Invited talk, Transcriptional and posttranscriptional regulatory networks underlying plant abiotic stress response, *Gordon Research Conferences: Salt and Water Stress in Plants*, Big Sky, MT, Sept. 7-12, 2008.
- Invited talk, MicroRNAs in Cassava: their conservation and possible functions for abiotic stress response, *Global Cassava Partnership First Scientific Meeting*, Ghent University, Belgium, July 21-25, 2008. (cancelled due to family reason)
- Invited talk, Integrated computational analysis of microRNA transcriptional regulation *NSF/IPAM Workshop on Search and Knowledge Building for Biological Datasets*, Los Angeles, CA, Nov. 26-30, 2007.
- Invited talk, Identification of communities in large networks and applications, IBM Watson Research Center, Nov. 1, 2007
- Invited seminar talk, Identification of stress-inducible microRNA genes in plants: A computational approach, Program in Molecular and Computational Biology, University of Southern California, Oct. 4, 2007.

- Invited seminar talk, Genome-wide motif identification and applications, Department of Computer Science, University of California at Los Angeles, Oct. 2, 2007.
- Invited talk, How robust is pure parsimony haplotype inference? *The 3rd RECOMB Satellite Workshop on Computational Methods for SNPs and Haplotypes*, Los Angeles, CA, Jan. 27-28, 2007.
- Invited talk, Data mining methods for modeling gene expression regulation and their applications, *IEEE International Conference on Data Mining (ICDM-2006)*, Hong Kong, Dec. 18-22, 2006.
- Invited seminar talk, Finding stress inducible microRNA genes in plants, Fall 2006 Seminar Series, Department of Genetics, Washington University School of Medicine, St. Louis, MO, Oct. 12, 2006.
- Invited talk, Phase transitions and backbones in combinatorial optimization problems and heuristic search methods, *Symp. on Hybrid Methods and Branching Rules in Combinatorial Optimization*, Montreal, Canada, Sept. 18-22, 2006.
- Keynote speech, Phase transitions and backbones in combinatorial optimization problems and heuristic search methods, *The 9th Pacific Rim International Conference on Artificial Intelligence (PRICAI-2006)*, Guilin, China, August 7-11, 2006.
- Invited talk, Phase transitions and backbones in combinatorial optimization problems, *Workshop on Hybrid Methods and Branching Rules in Combinatorial Optimization*, Sept. 18-22, 2006.
- Invited talk, Discovering temporal gene regulatory networks, NSF/IPAM (Proteomics: Sequence, Structure, Function) *Workshop on High Throughput Technologies and Methods of Analysis*, University of California at Los Angeles, California, March 22-26, 2004.
- Invited talk, Genome-wide identification and analysis of regulatory elements of ABA- and stress-inducible genes in Arabidopsis and rice, *International Symposium on Plant Functional Genomics*, Taipei, Taiwan, November 17-19, 2003.
- Keynote speech, Exploiting phase transitions and backbones for efficient problem solving, *The 15th International Conference on Tools for Artificial Intelligence (ICTAI-2003)*, Sacramento, CA, USA, November 3-5, 2003.
- Invited talk, Phase Transitions and Backbones of Combinatorial Optimization Problems and Heuristic Search, *The 18th International Joint Conference on Artificial Intelligence Workshop on Stochastic Search Algorithms*, Acapulco, Mexico, Aug. 9, 2003.
- Invited Lecture, Phase transitions, backbones, measurement precision, and phase-inspired approximation, *NSF/UCLA Institute for Pure and Applied Mathematics Workshop on Phase Transitions and Algorithmic Complexity*, University of California at Los Angeles, California, June 3 -5, 2002.
- Tutorial, Phase Transitions and Structures in Combinatorial Problems, *The 18th National Conference on Artificial Intelligence (AAAI-2002)*, Edmonton, Alberta, Canada, July 28-August 1, 2002.
- Tutorial, Phase Transitions and Structures in Combinatorial Problems, *The 17th International Joint Conference on Artificial Intelligence (IJCAI-2001)*, Seattle, Washington, August 4-10, 2001.
- Invited seminar, Combinatorial optimization: Complexity, phase transitions, backbones and flexible computation, U.S. Air Force Research Labs, Rome, NY, June 18, 2001.
- Invited seminar, Best-first search vs. dynamic programming for multiple sequence alignment, U.S. Air Force Research Labs, Rome, NY, June 18, 2001; also invited to give the same talk at Cornell University on June 19, 2001.
- Invited seminar, Datamining and search techniques, School of Computing, Georgia Tech, May, 1999.
- Invited plenary presentation, *SPIE Symposium on Data Mining and Knowledge Discovery: Theory, Tools, and Technology*, Orlando, Florida, April 5-6, 1999.
- Invited plenary presentation, *AAAI Fall Symposium on Flexible Computation in Intelligent Systems: Results, Issues, and Opportunities*, November 9-11, 1996, Cambridge, MA.

Professional Service – Grant Review (list only since 2010)

- *National Institutes of Health – NIH, Proposal Review Panelist*

- Alzheimer's Center for Discovery of New Medicines, 2019
- Special Emphasis Review Panel, 2019, 2018, 2017, 2016.
- Neural Basis of Psychopathology, Addictions and Sleep Disorder Study Section, 2016.
- RNA Biomarkers Review Panel, 2013, 2014.
- GTEx Stored Biospecimens Study Section Review Panel, 2013.
- BioData Management and Analysis (BDMA) Study Section Review Panel, 2011.
- Molecular Neurogenetics (MNG) Study Section Review Panel, 2010.
- *National Science Foundation* – NSF, Proposal Review Panelist
 - BIGDATA Program, 2016; 2015; 2012
 - IIS Panel on Graph Data Analytics, 2016
- *The Government of Hong Kong*, Proposal Review Panelist
 - *Health and Medical Research Fund*, 2019, 2018, 2017, 2016, 2015, 2014, 2013
 - *Research Grants Council (RGC)*, 2019, 2018, 2017, 2016, 2015, 2014, 2013, 2012, 2010
- *The European Union*, Large-scale European Research Initiative, Panelist,
 - Human Brain Project (HBP), 2014.

Professional Service – Major AI Conferences (list only since 2000)

- The AAAI National Conference on Artificial Intelligence – AAAI
 - Area Chair: 2019; 2018
 - Senior program committee member: 2017; 2016; 2015; 2005; 2003; 2002
 - Program committee member: 2008; 2007; 2006; 2000; 1996
- The International Joint Conference on Artificial Intelligence – IJCAI
 - Area Chair: 2015.
 - Senior program committee member: 2018; 2013.
 - Program committee member: 2009; 2005 (post session); 2003
- The International Conference on Automated Planning and Scheduling – ICAPS
 - Program committee member: 2011; 2010; 2009; 2008; 2004
- The International Symposium on Combinatorial Search – SoCS
 - Program committee member: 2011; 2010; 2009

Professional Service – Major Computational Biology Conferences (affiliated since 2010)

- The International Conference on Intelligent Systems for Molecular Biology – ISMB
 - Program committee member: 2019; 2018; 2017; 2009.
- International Conference on Algorithms for Computational Biology – AICoB
 - Program committee member: 2017; 2016.
- RECOMB/ISCB Conference on Regulatory and Systems Genomics with DREAM Challenges
 - Program committee member: 2018; 2017; 2016; 2015; 2014.
- ISMB/Bioinformatics for Regulatory Genomics Special Interest Group Meeting – BioRegSIG
 - Program committee member: 2018; 2017; 2016; 2015; 2014; 2012; 2011.

Research Funding (> \$12 million total, > \$10 million as PI and co-PI)

- *Accurate semantic image segmentation by integrating deep learning and Markov random fields modeling and its application to Varian image system* (\$174,000, 5/1/2019 – 4/30/2021) **Weixiong Zhang (PI)**, Baozhou Sun (co-PI). Funding source: Varian Corp.

- *Mendelian randomization for unbiased biomarker discovery for AD and other complex diseases* (\$1,850,000, 9/15/2018 – 5/31/2023), **Weixiong Zhang** (investigator), Oscar Harari (PI). Funding agency: National Institute on Aging (NIH), USA
- *Understanding the role of APP, PSEN1, PSEN2, TREM2, and PLD3 in AD* (\$450,000, 2/2016 – 1/2019), **Weixiong Zhang (co-PI)**. Carlos Cruchaga (PI), Funding agency: International Alzheimer's Association
- *A novel co-expression network approach that is robust to genetic heterogeneity and its applications* (R01 grant, \$1,185,600, 8/2012–7/2017), **Weixiong Zhang (PI)**. Funding agency: National Institute of General Medical Sciences (NIH), USA
- *Computational approaches to transcriptome modeling and applications to plant stress regulation* (\$419,267, 8/2008–10/2013) **Weixiong Zhang (PI)** and Ralph Quatrano (co-PI). Funding agency: National Science Foundation (NSF), USA
- *Genes and genetic interactions underlying pharmacological variation in yeast* (R01, Challenge grant, \$842,688, 9/2009–8/2012) **Weixiong Zhang (joint PI)** and Justin Fay (joint PI). Funding agency: National Institute of General Medical Sciences (NIH), USA
- *Supplemental Grant to MRCE Biodefense & Emerging Infectious Disease Center Grant* (Program Director: Samuel Stanley), Project 5: *Novel IFN-dependent innate antiviral mechanisms* (\$1,540,000, 3/2009–2/2012), **Weixiong Zhang (co-PI)** and Herbert Virgin (PI), Funding agency: National Institute of Allergy and Infectious Diseases (NIH), USA
- *MRCE Biodefense & Emerging Infectious Disease Center Grant* (Program Director: Samuel Stanley), Project 5: *Novel IFN-dependent innate antiviral mechanisms* (\$780,000, 3/2009–2/2012), Herbert Virgin (PI), Weixiong Zhang (**investigator**, 6% support), Funding agency: National Institute of Health (NIH), USA
- *Systems biology of psoriasis* (Challenge grant, \$1,536,005, 9/2009–8/2011) **Weixiong Zhang (joint PI)** and Anne Bowcock (joint PI). Funding agency: National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIH), USA.
- *Small RNA gene regulation in soybean seed development* (\$20,000, 9/2010–8/2011) **Weixiong Zhang (PI)**, Funding agency: US Department of Agriculture, USA.
- *Variable selection in genetic epidemiological studies of cardiovascular diseases* (R01, \$450,000, 8/2008–7/2011) Charles Gu (PI), **Weixiong Zhang (investigator**, 5% support), Funding agency: National Institute of Health (NIH), USA
- *The plasticity of the systemic inflammatory response in ventilator-associated pneumonia* (R01, \$750,000, 1/2009–1/2011) Perren Cobb (PI), Weixiong Zhang (**investigator**, 5% support), Funding agency: National Institute of Health (NIH), USA
- *Mechanistic heuristic problem solving and heuristic search algorithms that exploit phase transitions and backbones* (\$315,126, 11/2005–10/2009) **Weixiong Zhang (PI)**. Funding agency: National Science Foundation (NSF), USA
- *NSF/ITR: Best-first search algorithms for sequence alignment problems in computational biology* (\$448,039, 9/2001–9/2006) **Weixiong Zhang (PI)**, Richard E. Korf (co-PI) and Gary Stormo (co-PI) Funding agency: National Science Foundation (NSF), USA
- *Flexible and approximate computation through state-space reduction* (\$228,000, 6/1997–5/2003) **Weixiong Zhang (PI)** Funding agency: National Science Foundation (NSF), USA
- *Flexible and scalable methods for multi-agent distributed resource allocations by exploiting phase transitions* (\$934,591, 5/2000–12/2003) **Weixiong Zhang (PI)** Funding agency: Department of Advanced Research Program Agency (DARPA), USA
- *CATScan: Constraint-based approaches to time-bounded synthesis customization and adaptation in networked embedded systems* (\$1,030,102, 6/2001–9/2003) **Weixiong Zhang (PI)** and Ron Cytron (co-PI) Funding agency: Department of Advanced Research Program Agency (DARPA), USA
- *Discovery of causal regulatory networks and elucidation of complex traits* (\$97,500, 1/2008–12/2008) **Weixiong Zhang (PI)** Funding source: Monsanto Corp, USA

- *A network integrated functional genomics approach and its applications to abiotic stress regulation and tolerance in Arabidopsis* (\$95,000, 1/2007–12/2007) **Weixiong Zhang (PI)** Funding source: Monsanto Corp, USA
- *Identification and characterization of Arabidopsis microRNAs responsive to cold and drought* (\$75,000, 5/2006–12/2006) **Weixiong Zhang (PI)** Funding source: Monsanto Corp, USA
- *Regulatory networks for abiotic stress and ABA regulation in Arabidopsis* (\$300,000, 1/2005–12/2006) **Weixiong Zhang (PI)** Funding source: Monsanto Corp, USA.
- *Computational methods for genome-wide identification of stress-induced genes in plants* (\$214,000, 1/2003–12/2004) **Weixiong Zhang (PI)** Funding source: Monsanto Corp, USA

Student Training (postdoc fellows and graduated Ph.D. students only)

- Xiaoxin Liu, passed Ph.D. thesis proposal, October, 2018.
- Zhuangzhuang Zhang, first year Ph.D. student, 2018.
- Zheng Chen, received Ph.D. in Computer Science, April, 2015; Placement: research scientist, Facebook, USA.
- Jing Xia, received Ph.D. in Computer Science, December, 2014; Placement: postdoc at Department of Cell Biology, Yale University, USA.
- Xuefeng Zhou, received Ph.D. in Computer Science, August, 2012; Placement: Senior research scientist at Monsanto Company, USA.
- Ruoyun Huang, received Ph.D. in Computer Science, July, 2011 (supervised jointly with Yixin Chen); Placement: Senior scientist at Google, USA
- Monika Ray, received Ph.D. in Computer Science, December, 2008; placement: Senior research scientist at Roche Pharmaceuticals, USA.
- Zhao Xin, received Ph.D. in Computer Science, November, 2008; Placement: Project leader at Bank of America
- Jianhua Ruan, received Ph.D. in Computer Science, July, 2007; Placement: Associate professor, UT San Antonio, TX
- Sharlee Climer, received Ph.D. in December, 2006; Placement: Assistant professor, University of Missouri in St. Louis, MO
- Yun Zheng, Postdoctoral research associate, 8/2006 – 1/2009; Placement: Associate professor at Fudan University, Shanghai, China
- Gerold Jaeger, Postdoctoral research associate, 9/2006 – 9/2007; Placement: Professor at University Halle, Germany
- Weihong Zhang, Postdoctoral research associate, 5/2003 – 5/2005; Placement: Staff researcher at HP Lab

Publications

- One research monograph and 183 peer reviewed journal and conference papers. h-index 54.
- In AI, 12 papers in *Artificial Intelligence* and more than 30 papers in **IJCAI** and **AAAI Conf**.
- In Biology and Biomedicine, papers in such journals as *Nature Communications*, *PNAS*, *Genome Biology*, *Genome Research*, *Nucleic Acids Research*, *American J. of Human Genetics*, *Molecular Human Genetics*.
- *: corresponding author)

Research Monograph

1. **W. Zhang** (1999) *State-Space Search: Algorithms, Complexity, Extensions, and Applications*, Springer-Verlag, New York, NY, September, 1999.

Journal –Machine Learning and Computational & Molecular Biology (selected from 76 total)

2. X. Liu, Z. Hu, J. Zhou, C. Tian, G. Tian, M. He, L. Gao, L. Chen, T. Li, P. Peng, **W. Zhang***, Interior circular RNA, *RNA Biology*, 2019, DOI: 10.1080/154762862.2019.1669391.
3. L. Li, G. Tian, H. Peng, D. Meng, L. Wang, X. Hu, C. Tian, M. He, J. Zhou, L. Chen, C. Fu, **W. Zhang*** and Z. Hu*, New class of transcription factors controls flagellar assembly by recruiting RNA polymerase II in *Chlamydomonas*, *Proceedings of National Academy of Sciences of the USA* (PNAS), 115(17):4435-4440, 2018.
4. Zhong, P. Xuan*, X. Wang, T. Zhang, J. Li, Y. Liu and **W. Zhang**, A non-negative matrix factorization based method for predicting disease-associated miRNAs in miRNA-disease bilayer network, *Bioinformatics*, 34(2):267-77, 2018.
5. P. Xuan, T. Shen, X. Wang, T. Zhang and **W. Zhang**, Inferring disease-associated microRNAs in heterogeneous networks with node attributes, *IEEE/ACM Trans. Comput Biol Bioinform.*, 2018, in press.
6. J. Xia, L. Li, T. Li, Z. Fang, K. Zhang, J. Zhou, H. Peng, and **W. Zhang***, Detecting and characterizing microRNAs of diverse genomic origins via miRvial, *Nucleic Acids Research*, 45(21):e176, 2017.
7. L. Li, Z. Fang, J. Zhou, H. Chen, Z. Hu, L. Gao, L. Chen, S. Ren, H. Ma, L. Lu, **W. Zhang*** and H. Peng*, An accurate and efficient method for large-scale SSR genotyping and applications, *Nucleic Acids Research*, 45(10):e88, 2017.
8. T.P. Michael, D. Bryant, R. Gutierrez, N. Borisjuk, P. Chu, H. Zhang, J. Xia, J. Zhou, H. Peng, M.E. Baidouri, B. ten Hallers, AR. Hastie, T. Liang, K. Acosta, S. Gilbert, C. McEntee, SA. Jackson, TC. Mockler, **W. Zhang** and E. Lam*, Comprehensive definition of genome features in *Spirodela polyrhiza* by high-depth physical mapping and short-read DNA sequencing strategies, *The Plant Journal*, 89(3):617-35, 2017.
9. S. Climer*, A. Templeton and **W. Zhang***, Human *gephyrin* is encompassed within giant functional noncoding yin-yang sequences, *Nature Communications*, 6:6534, 2015.
10. W. Wang, B. Feng, J. Xiao, Z. Xia, X. Zhou, P. Li, **W. Zhang**, et al., Cassava genome from a wild ancestor to cultivated varieties, *Nature Communications*, 5:5110, 2014.
11. S. Climer, A. Templeton and **W. Zhang***, Allele-specific network reveals combinatorial interactions that transcends small effects in psoriasis GWAS, *PLOS Computational Biology*, 10(9):e1003766, 2014.
12. J. Xia and **W. Zhang*** (2014) MicroRNAs in normal and psoriatic skin, *Physiological Genomics*, 46(4):113-22, 2014, invited review.
13. J. Xia and **W. Zhang*** (2014) A meta-analysis revealed insights into the sources, conservation and impact of microRNA 5'-isoforms in four model species, *Nucleic Acids Research*, 42(3):1427-41, 2014.
14. J. Xia, C.E. Joyce, A.M. Bowcock* and **W. Zhang*** (2013) Noncanonical microRNAs and endogenous siRNAs in normal and psoriatic human skin, *Human Molecular Genetics*, 22(4):737-48, 2013.
15. Z. Chen and **W. Zhang*** (2013) Integrative analysis using module-guided Random Forests reveals correlated genetic factors related to mouse weight, *PLOS Computational Biology*, 9(3):e1002956, 2013.
16. X. Zhang, X. Jin, Y. Lii, B.E. Barrera-Figueroa, X. Zhou, S. Gao, L. Lu, D. Nie, Z. Chen, C. Leung, T. Wong, H. Zhang, J. Guo, Y. Li, R. Liu, W. Liang, J-K. Zhu, **W. Zhang***, H. Jin* (2012) Genome-wide analysis of plant nat-siRNAs reveals insights into their distribution, biogenesis and function, *Genome Biology*, 13:R20, 2012.
17. **W. Zhang***, S. Guo, X. Zhou, P. Chellappan, Z. Chen, X. Zhou, X. Zhang, N. Fromuth, G. Coutino, M. Coffey and H. Jin* (2011) MicroRNAs regulate plant innate immunity by modulating plant hormone networks, *Plant Molecular Biology*, 75(1-2):93-105, 2011.
18. C.E. Joyce, X. Zhou, J. Xia, C. Ryan, B. Thrash, A. Menter, **W. Zhang*** and A.M. Bowcock* (2011) Deep sequencing of small RNAs from human skin reveals major alterations in the psoriasis miRNAome, *Human Molecular Genetics*, 20(20):4025-40, 2011
19. **W. Zhang***, S. Guo, J. Xia, X. Zhou, P. Chellappan, X. Zhou, X. Zhang and H. Jin* (2010) Multiple distinct small RNAs originated from the same microRNA precursors, *Genome Biology*, 11:R81, 2010.

20. P. Chellappan, J. Xia, X. Zhou, S. Gao, X. Zhang, G. Coutino, F. Vazquez, **W. Zhang*** and H. Jin* (2010) siRNAs from miRNA sites mediate DNA methylation of target genes, *Nucleic Acids Research*, 38(20):6883-94, 2010.
21. C. Zeng, W. Wang, Y. Zheng, X. Chen, X. Bo, S. Song, **W. Zhang***, M. Peng* (2010) Conservation and divergence of microRNAs and their functions in Euphorbiaceae plants, *Nucleic Acids Research*, 38(3):981-95, 2010.
22. T.A. Reese, J. Xia, L.S. Johnson, X. Zhou, **W. Zhang*** and H.W. Virgin* (2010) Identification of novel microRNA-like molecules generated from herpesvirus and host tRNA transcripts, *J. Virology*, 84(19):10344-53, 2010.
23. J. Ruan, A.K. Dean and **W. Zhang*** (2010) A general co-expression network-based approach to gene expression analysis: Comparison and applications, *BMC Systems Biology*, 4:8, 2010.
24. X. Zhou, R. Sunkar, H. Jin, J-K. Zhu and **W. Zhang*** (2009) Genome-wide identification and analysis of small RNAs originated from natural antisense transcripts in *Oryza sativa*, *Genome Research*, 19:70-8, 2009.
25. J.A. Webster, J.R. Cibbs, J. Clarke, M. Ray, **W. Zhang**, P. Holmans, K. Rohrer, A. Zhao, L. Marlowe, M. Kaleem, D.S. McCorquodale III, C. Cuello, D. Leung, L. Bryden, P. Nath, V.L. Zisman, K. Joshipura, M.J. Huentelman, D. H Lince, K.D. Coon, D.W. Craig, J.V. Pearson, C.B. Heward, E.M. Reiman, D. Stephan, J. Hardy, A.J. Myers* (2009) Genetic control of human brain transcript expression in Alzheimer's disease, *American J. of Human Genetics*, 84:445-58, 2009.
26. M. Ray and **W. Zhang*** (2009) Integrating genetic and phenotypic information to analyze Alzheimer's disease, *J. of Alzheimer's Disease*, 16(1):73-84, 2009.
27. M. Ray J. Ruan and **W. Zhang*** (2008) Variations in the transcriptome of Alzheimer's disease reveal molecular networks involved in cardiovascular diseases, *Genome Biology*, 9(10):R148, 2008.
28. Y. Xu, X. Zhou and **W. Zhang*** (2008) MicroRNA prediction with a novel ranking algorithm based on random walks, *Bioinformatics*, 24:i50-8, 2008.
29. J. Ruan and **W. Zhang** (2008) Identifying network communities with high resolution, *Physical Review E*, 77:016104, 2008.
30. X. Zhou, G. Wang and **W. Zhang*** (2007) UV-B light responsive microRNA genes in *Arabidopsis thaliana*, *Nature Molecular Systems Biology*, 3:103, 2007.
31. X. Zhou, J. Ruan, G. Wang and **W. Zhang*** (2007) Characterization and identification of microRNA core promoters in four model species, *PLoS Computational Biology*, 3(3):e37, 2007.
32. G. Wang and **W. Zhang*** (2006) A steganalysis-based approach to comprehensive identification and characterization of functional regulatory elements, *Genome Biology*, 7(6):R49, 2006.
33. S. Climer and **W. Zhang** (2006) Rearrangement clustering: Pitfalls, remedies and applications, *J. Machine Learning Research*, 7:919-43, 2006.
34. **W. Zhang***, J.Ruan, T-h. D.Ho, Y. You, T. Yu and R.S. Quatrano (2005) Cis-regulatory element based targeted gene finding: Genome-wide identification of ABA and abiotic stress responsive genes in *Arabidopsis thaliana*, *Bioinformatics*, 21(14):3074-81, 2005.
35. G. Wang, T. Yu and **W. Zhang*** (2005) WordSpy: Identify transcription factor binding motifs by building a dictionary and learning a grammar, *Nucleic Acids Research*, 33:W4126, 2005.
36. J. Ruan, G. Stormo and **W. Zhang*** (2004) ILM: A web server for predicting RNA secondary structures with pseudoknots, *Nucleic Acids Research*, 32:W146-9, 2004.
37. J. Ruan, G. Stormo and **W. Zhang*** (2004) An iterated loop matching approach to the prediction of RNA secondary structures with pseudoknots, *Bioinformatics*, 20(1):58-66, 2004.

Journal – Artificial Intelligence and Heuristic Search (selected from 28 total)

38. G. Jager, S. Climer and **W. Zhang**. Complete Parsimony Haplotype Inference Problem and Algorithms Based on Integer Programming, Branch-and-Bound and Boolean Satisfiability, *J. Discrete Algorithms*, 37:68-83, 2016.

39. Q. Lu, R. Huang, Y. Chen, Y. Xu, **W. Zhang**, G. Sun and G. Chen, A SAT-based approach to cost sensitive temporally expressive planning, *ACM Transactions on Intelligent Systems and Technology*, 5(1):18, 2013.
40. R. Huang, Y. Chen and **W. Zhang** (2012) SAS+ planning as Satisfiability, *J. Artificial Intelligence Research*, 43:293-328, 2012 (**Winner of the AAAI-2010 Outstanding Paper Award**).
41. G. Jaeger and **W. Zhang** (2010) An efficient algorithm for and phase transitions of the directed Hamiltonian cycle problem, *J. Artificial Intelligence Research*, 39:663-87, 2010.
42. Y. Chen, R. Huang, Z. Xing and **W. Zhang** (2009) Long-distance mutual exclusion for planning, *Artificial Intelligence*, 173:365-91, 2009.
43. S. Climer and **W. Zhang** (2006) Cut-and-solve: A linear search strategy for combinatorial optimization problems, *Artificial Intelligence*, 170(8-9):714-38, 2006.
44. R. Korf, **W. Zhang**, I. Thayer and H. Hohwald (2005) Frontier search, *J. ACM*, 52(5):71548, 2005.
45. Z. Xing and **W. Zhang** (2005) MaxSolver: An efficient exact algorithm for maximum satisfiability, *Artificial Intelligence*, 164(1-2):47-80, 2005.
46. **W. Zhang**, G. Wang, Z. Xing and L. Wittenberg (2005) Distributed stochastic search and distributed breakout: Properties, comparison and applications to constraint optimization problems in sensor networks, *Artificial Intelligence*, 161(1-2):55-87, 2005.
47. **W. Zhang** (2004) Configuration landscape analysis and backbone guided local search: Part I: satisfiability and maximum satisfiability, *Artificial Intelligence*, 158(1):1-26, 2004.
48. A. K. Sen, A. Bagchi and **W. Zhang** (2004) Average-case analysis of best-first search in directed acyclic graphs, *Artificial Intelligence*, 155(1-2):183-206, 2004.
49. **W. Zhang** (2004) Phase transitions and backbones of the asymmetric Traveling Salesman Problem, *J. Artificial Intelligence Research*, 20:471-97, 2004.
50. **W. Zhang**, R. Dechter and R. E. Korf (2001) Heuristic search in artificial intelligence, *Artificial Intelligence*, 129(1-2):1-4, 2001.
51. **W. Zhang** (2001) Iterative state-space reduction for flexible computation, *Artificial Intelligence*, 126(1-2):109-38, 2001.
52. M. Tambe and **W. Zhang** (2000) Towards flexible team work in persistent teams: Extended report, *Autonomous Agents and Multi-Agent Systems*, 3(2):159-83, 2000. (selected as **the Best of ICMAS-98**).
53. **W. Zhang** and R. E. Korf (1996) A study of complexity transitions on the asymmetric Traveling Salesman Problem, *Artificial Intelligence*, 81(1-2):223-39, 1996.
54. J. C. Pemberton and **W. Zhang** (1996) Epsilon-transformation: Exploiting phase transitions to solve combinatorial optimization problems, *Artificial Intelligence*, 81(1-2):297-325, 1996.
55. **W. Zhang** and R.E.Korf (1995) Performance of linear-space search algorithms, *Artificial Intelligence*, 79(2):241-92, 1995.
56. **W. Zhang** and R.E. Korf (1994) Parallel heap operations on EREW PRAM, *J. Parallel and Distributed Computing*, 20(2):248-55, 1994.
57. **W. Zhang** (1989) Representation of assembly and automatic robot planning by Petri net, *IEEE Trans. on Systems, Man and Cybernetics*, 19(2):418-22, 1989.

Book Chapters (selected from 9 total)

58. **W. Zhang***, X. Zhou, X. Zhou and J. Xia (2012) Identification of microRNAs and natural antisense transcript-originated endogenous siRNAs from small-RNA deep sequencing data, in *Methods in Molecular Biology*, 883:221-7, 2012. doi: 10.1007/978-1-61779-839-9_17.
59. M. Ray, J. Freudenberg and **W. Zhang*** (2007) Reproducibility of results of microarray data preprocessing on differentially expressed transcript selection, *Normalization methods for microarray data analysis*, P. Stafford (editor), Taylor and Francis Publications, 2007.

60. R. Souvenir, J. Buhler, G. Stormo and **W. Zhang*** (2007) An iterative method for selecting degenerate multiplex PCR primers, in *Methods in Molecular Biology: PCR Primer Design*, A. Yuryev (editor), 2007, pp.245-67.
61. D. S. Johnson, G. Gutin, L. A. McGeoch, A. Yeo, **W. Zhang** and A. Zverovich (2002) Experimental analysis of heuristics for the ATSP, in *The Traveling Salesman Problem and its Variations*, G. Gutin and A. Punnen (eds), Kluwer Academic Publishers, 2002, pp.445-88.
62. **W. Zhang** (2002) Search techniques, *Handbook of Data Mining and Knowledge Discovery*, Chapter 8, Oxford University Press, 2002, pp.169-84.

Refereed Conferences –Machine Learning and Computational Biology (selected from 30 total)

63. D. Jin, B. Li, P. Jiao, D. He and **W. Zhang**, Network-specific variational Auto-Encoder for embedding of attribute networks, *Proc 28-th Intern. Joint Conf. on AI (IJCAI-19)*.
64. D. Jin, Z. Liu, W. Li, D. He and **W. Zhang**, Graph convolutional networks meet Markov Random Fields: Semi-supervised community detection in attribute networks, *Proc 33-th AAAI Conf on AI (AAAI-19)*.
65. G. Meng, D. Jin and **W. Zhang**, Integrative network embedding via deep joint reconstruction, *Proc 27-th Intern. Joint Conf. on AI (IJCAI-18)*.
66. D. He, X. You, Z. Feng, D. Jin, X. Yang and **W. Zhang**, A network-specific Markov Random Field approach to community detection, *Proc 32-nd AAAI Conf on AI (AAAI-18)*.
67. D. Jin, X. Wang, R. He, D. He and **W. Zhang**, Robust detection of link communities in large social networks by exploiting link semantics, *Proc 32-nd AAAI Conf on AI (AAAI-18)*.
68. D. He, D. Jin and **W. Zhang**, Joint identification of network communities and semantics via integrative modeling of network topologies and node contents, *Proc 31-st AAAI Conf on AI (AAAI-17)*.
69. L. Yang, X. Cao, D. He, **W. Zhang**, Modularity based community detection with deep learning, *Proc 25-th Intern. Joint Conf. on AI (IJCAI-16)*, Buenos Aires, July 25-31, 2016. (Oral presentation, acceptance rate: ~17%.)
70. D. Jin, H. Wang, J. Dang, D. He and **W. Zhang**, Detect overlapping communities via ranking node popularities, *Proc 30-th AAAI Conf on AI (AAAI-16)*, Phoenix, Arizona, Feb 12-17, 2016. (Oral presentation, acceptance rate: ~21%.)
71. X. Wang, D. Jin, X. Cao, L. Yang and **W. Zhang**, Semantic community identification in large attribute networks, *Proc 30-th AAAI Conf on AI (AAAI-16)*, Phoenix, Arizona, Feb 12-17, 2016. (Oral presentation, acceptance rate: ~21%.)
72. Z. Chen, M. Chen, K. Weinberger and **W. Zhang**, Marginalized denoising for link prediction and multi-label learning, *Proc. 29th AAAI Conference on Artificial Intelligence (AAAI-15)*, Austin Texas, USA, Jan. 25-30, 2015. (Oral presentation, acceptance rate: ~26%.)
73. D. Jin, Z. Chen, D. He and **W. Zhang**, Modeling with node degree preservation can accurately find communities, *Proc. 29th AAAI Conference on Artificial Intelligence (AAAI-15)*, Austin Texas, USA, Jan. 25-30, 2015. (Poster, acceptance rate: ~26%.)
74. D. He, D. Liu, D. Jin and **W. Zhang**, A stochastic model for the detection of heterogeneous link communities in complex networks, *Proc. 29th AAAI Conference on Artificial Intelligence (AAAI-15)*, Austin Texas, USA, Jan. 25-30, 2015. (Oral presentation, acceptance rate: ~26%.)
75. Z. Chen and **W. Zhang** (2013) Domain adaptation with topical correspondence learning, *Proc. 23rd Intern. Joint Conf. on Artificial Intelligence (IJCAI-13)*, Aug. 3-9, 2013, Beijing, China. (Oral presentation, acceptance rate: ~28%.)
76. J. Ruan and **W. Zhang** (2007) An efficient spectral algorithm for network community discovery and its applications to biological and social networks, *Proc. IEEE Intern. Conf. on Data Mining (ICDM-2007)*, Omaha, NE, USA, Oct. 28-31, 2007.
77. J. Ruan and **W. Zhang** (2006) Identification and evaluation of weak community structures in networks, *Proc. 21st National Conf. on Artificial Intelligence*, (AAAI-2006), Boston, Massachusetts, July 16-20, 2006, pp.470-5.

78. S. Climer and **W. Zhang** (2004) Take a walk and cluster genes: A TSP-based approach to optimal rearrangement clustering, *Proc. Intern. Conf. on Machine Learning (ICML-2004)*, Alberta, Canada, July 4-8, 2004, pp.169-76.

Refereed Conferences – Artificial Intelligence, Optimization and Search (selected from 44 total)

79. X. Zhang and **W. Zhang**, A fast algorithm for generalized arc consistency of the alldifferent constraint, *Proc 27-th Intern. Joint Conf. on AI (IJCAI-18)*.
80. R. Huang, Y. Chen and **W. Zhang** (2010) A novel transition based encoding scheme for planning as Satisfiability, *Proc. 24th AAAI Conference on Artificial Intelligence (AAAI-10)*, Atlanta, Georgia, USA, July 11-15, 2010. **Winner of the Outstanding Paper Award**.
81. R. Huang, Y. Chen and **W. Zhang** (2009) An optimal temporally expressive planner: Initial results and application to P2P network optimization, *Proc. 19th Intern. Conf. on Automated Planning and Scheduling (ICAPS-09)*, Thessaloniki, Greece, Sept. 19-23, 2009.
82. Y. Chen, R. Huang and **W. Zhang** (2008) Fast planning by search in domain transition graphs, *Proc. 23rd AAAI Conference on Artificial Intelligence (AAAI-2008)*, Chicago, IL, USA, July 13-17, 2008.
83. Z. Xing, Y. Chen and **W. Zhang** (2007) Long-distance mutual exclusion for propositional planning, *Proc. 20th Intern. Joint Conf. on Artificial Intelligence (IJCAI-2007)*, Hyderabad, India, Jan. 9-12, 2007.
84. Z. Xing, Y. Chen and **W. Zhang** (2006) Optimal STRIPS planning by maximum satisfiability and accumulative learning, *Proc. Intern. Conf. on Automated Planning and Scheduling (ICAPS-2006)*, Cumbia, UK, June 6-10, 2006, pp.442-7.
85. Z. Xing, Y. Chen and **W. Zhang** (2006) MaxPlan: Optimal planning by decomposed satisfiability and backward reduction, *Proc. 5-th International Planning Competition, Intern. Conf. on Automated Planning and Scheduling (ICAPS-2006)*, Cumbia, UK, June6-10, 2006, pp.53-6. (**First Place Award**, Optimal Planning Track)
86. **W. Zhang** and M. Looks (2005) A novel local search algorithm for the Traveling Salesman Problem that exploits backbones, *Proc. 19th Intern. Joint Conf. on Artificial Intelligence (IJCAI-2005)* Edinburgh, Scotland, July 30 -Aug. 5, 2005, pp. 343-50.
87. S. Climer and **W. Zhang** (2004) A linear search strategy with bounds, *Proc. 14th Intern. Conf. on Automated Planning and Scheduling (ICAPS-2004)*, British Columbia, Canada, June 3-7, 2004, pp.132-41.
88. X. Zhang and **W. Zhang** (2004) An improved integer local search for complex scheduling problems, *Proc. 14-th Intern. Conf. on Automated Planning and Scheduling (ICAPS-2004)*, British Columbia, Canada, June 3-7, 2004, pp.83-91.
89. **W. Zhang** (2003) Phase transitions of the asymmetric Traveling Salesman, *Proc. 18th Intern. Joint Conf. on AI (IJCAI-2003)*, Acapulco, Mexico, Aug. 9-15, 2003, pp.1202-7.
90. **W. Zhang**, A. Rangan and M. Looks (2003) Backbone guided local search for maximum satisfiability, *Proc. 18-th Intern. Joint Conf. on AI (IJCAI-2003)*, Acapulco, Mexico, Aug. 9-15, 2003, pp.1179-84.
91. **W. Zhang**, Z. Xing, G. Wang and L. Wittenburg (2003) An analysis and application of distributed constraint satisfaction and optimization algorithms in sensor networks, *Proc. 2nd Intern. Joint Conf. on Autonomous Agents and Multi Agent Systems (AAMAS-2003)*, Melbourne, Australia, July 14-18, 2003.
92. **W. Zhang** and L. Wittenburg (2002) Distributed implicit coordination in sensor networks, in *Proceedings of 1st International Joint Conference on Autonomous Agents and Multi-Agent Systems (AAMAS-2002)*, Bologna, Italy, July15-29, 2002.
93. **W. Zhang** and L. Wittenburg (2002) Distributed breakout revisited, in *Proceedings of 18th National Conference on Artificial Intelligence (AAAI-2002)*, Edmonton, Canada, July 28-August 1, 2002, pp.352-7.
94. S. Climer and **W. Zhang** (2002) Search for backbones and fat: A limiting-crossing approach with applications, in *Proceedings of 18th National Conference on Artificial Intelligence (AAAI-2002)*, Edmonton, Canada, July 28-August 1, 2002, pp.707-12.

95. A. K. Sen, A. Bagchi and **W. Zhang** (2002) An Average-case analysis of graph search, in *Proc. 18th National Conference on Artificial Intelligence (AAAI-2002)*, Edmonton, Canada, July 28-August 1, 2002, pp.757-62.
96. **W. Zhang** (2001) Phase transitions and backbones of 3-SAT and MAX3-SAT, in *Proc. 7th International Conference on Principles and Practice of Constraint Programming (CP-2001)*, November, 2001, pp.153-67.
97. **W. Zhang** (2000) Depth-first branch-and-bound vs. local search: A case study, *Proceedings of 17th National Conference on Artificial Intelligence (AAAI-2000)*, Austin, Texas, July 30 - August 3, 2000, pp.930-5.
98. R. E. Korf and **W. Zhang** (2000) Divide-and-conquer frontier search applied to multiple sequence alignment, *Proceedings of 17th National Conference on Artificial Intelligence (AAAI-2000)*, Austin, Texas, July 30-August 3, 2000, pp.910-6.
99. **W. Zhang** (2000) Association-based multiple imputation in multivariate datasets: A summary, *Proceedings of 16th International Conference on Data Engineering (ICDE-2000)*, San Diego, CA, February 29 -March 3, 2000, pp.310.
100. K.S. Tso, G.K. Tharp, **W. Zhang** and A.T. Tai (1999) A multi-agent operator Interface for unmanned aerial vehicles, *Proceedings of 18th Digital Avionics Systems Conference*, St. Louis, MO, October 24-29, 1999.
Best paper award
101. **W. Zhang** (1998) Complete Anytime Beam Search, *Proceedings 15th National Conference on Artificial Intelligence (AAAI-1998)*, Madison, Wisconsin, July 26-30, 1998, pp.425-30.
102. **W. Zhang** (1998) Flexible and approximate computation through state-space reduction, *Proceedings of 14th Annual Conference on Uncertainty in Artificial Intelligence (UAI-1998)*, Madison, Wisconsin, July 24-26, 1998, pp.531-8.
103. M. Tambe and **W. Zhang** (1998) Towards flexible teamwork in persistent teams, *Proceedings of International Conference on Multi-Agent Systems (ICMAS-1998)*, Paris, France, July 3-7, 1998, pp.277-84. Selected as the **Best of ICMAS-98**.
104. **W. Zhang** (1996) Forward estimation for game-tree search, *Proceedings of 13th National Conference on Artificial Intelligence (AAAI-1996)*, Portland, OR, 1996, pp.240-5.
105. **W. Zhang** and J.C. Pemberton (1994) Epsilon-transformation: Exploiting complexity transitions to solve combinatorial optimization problems -Initial results, *Proceedings of 12th National Conference on Artificial Intelligence (AAAI-1994)*, Seattle, WA, July, 1994, pp.895-900.
106. **W. Zhang** and R.E. Korf (1993) Depth-first vs. best-first search: New results, *Proceedings of 11th National Conference on Artificial Intelligence (AAAI-1993)*, Washington, DC, July 11-15, 1993, pp.769-75.
107. **W. Zhang** and R.E. Korf (1992) An average-case analysis of branch-and-bound with applications: Summary of results, *Proceedings of 10th National Conference on Artificial Intelligence (AAAI-1992)*, San Jose, CA, July 12-17, 1992, pp.545-50.