

Pengpeng Wang

CONTACT INFORMATION

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RESEARCH INTERESTS

Robot motion planning; Stochastic geometry; information theory; combinatorial optimization; mathematical programming; distributed algorithms; online algorithm; approximation algorithms.

EDUCATION

Simon Fraser University, Burnaby, B.C., Canada

Ph.D. Candidate, Engineering Science. Degree expected: Nov. 2006.

- Dissertation Topic: “View Planning with Combined View and Travel Cost”
- Co-advisors: Dr. Kamal Gupta, School of Engineering Science, and Dr. Ramesh Krishnamurti, School of Computing Science
- CGPA: 4.1/4.3

M. A. Sc., Engineering Science. Completed: May 2003.

- Thesis: “View Planning Via Maximal C-Space Entropy Reduction”
- Advisor: Dr. Kamal Gupta, School of Engineering Science
- CGPA: 3.9/4.0

University of British Columbia, Vancouver, B.C., Canada

Visiting Ph.D. Student, Computer Science Department, 2003.

University of Science and Technology of China, Hefei, Anhui, P.R. China

B. S., Electrical Engineering. Completed: July 1998

- Thesis: “Expert System Based on Web Indexing and Searching Technology”
- Advisor: Dr. Fanlun Xiong, Institute of Intelligent Machines, Chinese Academy of Sciences

HONORS AND AWARDS

Natural Science and Engineering Research Council of Canada (NSERC) Postgraduate Scholarship for Doctorate Students, 2003 - 2005.

Sigma Xi, Honor Research Society, 2004 - present.

Graduate School Graduate Fellowship, Simon Fraser University, 2001 and 2006.

President’s PhD Research Stipend, Simon Fraser University, 2005

Lang Wong Memorial Endowment Scholarship, Simon Fraser University, 2001 and 2004.

Faculty of Applied Science Fellowship, Simon Fraser University, 2001 and 2006.

Research Assistantship, School of Computing Science, Simon Fraser University, 2006.

Research Assistantship, School of Engineering Science, Simon Fraser University, 2000-2006.

WORK AND RESEARCH EXPERIENCE

Research Assistant, School of Computing Science, Simon Fraser University **May 2006 - Present**
Design, implement and analyze approximation algorithms for combinatorial optimization and computational geometry problems, including data structure design for efficient visibility computations.

Research Assistant, School of Engineering Science, Simon Fraser University **Jan. 2000 - Present**
Be responsible for research projects: simultaneous inspection and exploration for robot sensor systems, information theoretical approach to sensor-based robot motion planning problems, robot forward and inverse kinematics analysis and robot control server design and implementation. All algorithms are implemented and tested on simulators and real experimental systems. The software development includes graphics programming, rigid body modeling, programming, and collision

detection (using third party libraries V-COLLIDE and LEDA).

Participant, The Tenth Industrial Problem Solving Workshop, the Pacific Institute for the Mathematical Sciences **May 2005**

Worked on mathematical modeling for industrial problem, "Identification of Seismic Layers using Classification of Pixels Local Spectra."

Participant, The Ninth Industrial Problem Solving Workshop, the Pacific Institute for the Mathematical Sciences **May 2004**

Worked on mathematical modeling for industrial problem, "Network Traffic for Malicious Hacker Activity".

Research Associate, Univ. of Science and Tech. of China Ifly Co. Ltd, P. R. China **1998 - 1999**
Research on stochastic systems modeling and analysis for human voice synthesis.

Research Assistant, Hefei Institute of Intelligent Machines, P. R. China **1997 - 1998**
Research on expert system design.

ACADEMIC
EXPERIENCE

Journal and Conference Reviewer/Referee **2000 - present**
Journals and conferences include various IEEE and ACM conferences and journals.

Student Participant of "Workshop on Approximation Algorithms", IIT Delhi, India **Oct. 2005**
Learned the state of art from, and interacted with some top researchers in the approximation algorithm field.

Participant of "PIMS Graduate Industrial Mathematics Modeling Camp", Canada **University of Victoria, May 2004, and University of Lethbridge, May 2005**

Worked on the problems of facility location and rectangle stabbing (both are combinatorial optimization problems), and the problem of multi-robot path planning respectively in the two camps.

Teaching Assistant **2003, 2005**
Teaching assistant for the course "feedback control system", School of Engineering Science, Simon Fraser University. Duties included designing lab experiments on a physical system and designing homework, marking homework and lab assignments, giving tutorials, designing and marking midterms and finals.

Academic Advisor **2002, 2003**
Supervised several undergraduate students for their undergraduate thesis works at SFU. These theses works were on designing efficient next-best-view algorithms for multi-sensory (eye- and skin-type) robotic exploration tasks and developing a two-dimensional simulator.

REFEREED
PUBLICATIONS

P. Wang, and K. Gupta. *View Planning for Exploration via Maximal C-space Entropy Reduction for Robot Mounted Range Sensors*. Accepted to Advanced Robotics, 2006.

P. Wang, and K. Gupta. *A Configuration Space View of View Planning*. In Proc. of IEEE/RSJ International Conference on Intelligent Robots and Systems, 2006.

M. Suppa, P. Wang, K. Gupta, and G. Hirzinger. *C-space Exploration Using Noisy Sensor Models*. In Proc. of IEEE International Conference on Robotics and Automation, 2004. Paper presented at the conference, 2004, New Orleans, LA.

P. Wang, and K. Gupta. *Computing C-space Entropy for View Planning Based on Generic Sensor Model*. In Proc. of IEEE International Conference on Robotics and Automation, 2003. Paper presented at the conference, 2003, Taipei.

P. Wang, and K. Gupta. *View Planning via Maximal C-space Entropy Reduction*. In Proc. of International Workshop on Algorithmic Foundations of Robotics, 2002, pp.140-156. Paper presented at the conference, 2002, Nice, France.

P. Wang, and K. Gupta. *Computing C-space Entropy for View Planning Based on Beam Sensor Model*. In Proc. of IEEE/RSJ International Conference on Intelligent Robots and Systems, 2002,

pp. 2389-2394. Paper presented at the conference, 2002, Lausanne, Switzerland.

P. Wang, and K. Gupta. *View Planning via Maximal C-space Entropy Reduction*, Boissonnat J., Burdick J., Goldberg K., ed. Algorithmic Foundations of Robotics V, Springer Tracts in Advanced Robotics, pp. 149-166, 2003.

P. Wang, and K. Wang. *A Fast Pattern Matching Algorithm*. Computer Science, 1999.

WORKSHOP AND
TECHNICAL
REPORTS

P. Wang, R. Krishnamurti, and K. Gupta. *View Planning With Combined Viewing and Traveling Costs*. Technical Report TR 2006-17, School of Computing Science, Simon Fraser University, Burnaby, BC, Canada, May 2006.

P. Wang *et. al.* *Seismic Image Analysis Using Local Spectra*. In Proc. of the Ninth Annual Industrial Problem Solving Workshop, May 15-19, 2005.

P. Wang *et. al.* *Problems in Facility Location Optimization*. In Report of the Eighth PIMS Graduate Industrial Math Modeling Camp, May 7-11, 2005.

P. Wang *et. al.* *Analyzing Network Traffic for Malicious Hacker Activity*. In Proc. of the Eighth Annual Industrial Problem Solving Workshop, May 17-21, 2004.

P. Wang *et. al.* *Path Planning for Autonomous Robots*. In Report of Seventh PIMS-MITACS Graduate Industrial Math Modeling Camp, May 10-14, 2004.

P. Wang *Simultaneous Inspection and Exploration of Robot Sensor Systems*. Poster Presentation, BC ASI Exchange, March 2004.

PAPERS SUBMISSION
AND PREPARATIONS

P. Wang, R. Krishnamurti, and K. Gupta. *View Planning Problem with Combined View and Traveling Cost*. Submitted to Algorithmica.

P. Wang, R. Krishnamurti, and K. Gupta. *View Planning with Combined Viewing and Traveling costs*. Submitted to IEEE International Conference on Robotics and Automation 2007.

P. Wang, R. Krishnamurti, and K. Gupta. *Metric View Planning with Traveling cost and Visibility Range*. Submitted to IEEE International Conference on Robotics and Automation 2007.

COMPUTER SKILLS

- Computer Languages: Proficient in C, C++, Basic, Matlab, Open GL, and Socket programming.
- C and C++ Libraries: LEDA, ILOG CPLEX, V-COLLIDE.
- Computer Skills: Proficient in TeX, LaTeX, MS Office, and Open Office.
- Operating Systems: Unix/Linux, Windows.

REFERENCES

Dr. Kamal Gupta (Master advisor and Ph.D. co-advisor), Professor and Associate Director, School of Engineering Science, Simon Fraser University, Canada. Email: kamal@cs.sfu.ca

Dr. Ramesh Krishnamurti (Ph.D. co-advisor), Professor, School of Computing Science, Simon Fraser University, Burnaby, BC, Canada. Email: ramesh@cs.sfu.ca

Dr. Mirza Faisal Beg, Assistant Professor, School of Engineering Science, Simon Fraser University, Burnaby, BC, Canada. Email: mfbeg@cs.sfu.ca