

Liangjun Zhang

CONTACT INFORMATION

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RESEARCH INTERESTS

Robot motion planning; Geometric computation; CAD and virtual prototyping; Digital human modeling; Computational biology, Computer graphics

EDUCATION

University of North Carolina, Chapel Hill, USA

Ph.D. Computer Science Department. Conferred on Dec 2009. **Aug 2005 - Aug 2009**
Advisor: Prof. Dinesh Manocha
Dissertation: Efficient Motion Planning using Generalized Penetration Depth Computation
M.S. Computer Science Department. Conferred on Dec 2007.

Zhejiang University, China

M.S. College of Computer Science. **Sep 2000 - Mar 2003**
B.S. College of Computer Science, GPA: 3.8/4.0, Top 5% (among 200) **Sep 1996 - Jul 2000**

RESEARCH EXPERIENCE

Department of Computer Science, Stanford University **Sep 2009 - Present**

NSF Computing Innovation Fellow

- Mentor: Prof. Jean-Claude Latombe
- Efficient sampling for folded protein conformations
- Motion planning for human-like robots

Department of Computer Science, UNC-Chapel Hill **May 2005 - Aug 2009**

Research Assistant

- Geometric algorithms for generalized penetration depth computation
- Efficient motion planning algorithms for cluttered environments, constrained motion interpolation
- Applications to part disassembly, virtual prototyping and CAD/CAM
- Practical algorithms for complete motion planning and path non-existence problem; global vector field computation for feedback motion planning
- Motion planning for human-like robots

College of Computer Science, Zhejiang University **Mar 2001 - Mar 2003**

Research Assistant

- 3D meshes digital watermarking and collaborative CAD.

JOURNAL PUBLICATIONS

1. **Liangjun Zhang**, Young J. Kim, Dinesh Manocha, *Efficient Cell Labelling and Path Non-existence Computation using C-obstacle Query*, The International Journal of Robotics Research (special issue on WAFR06), Volume 27, Issue 11-12, 1246-1257, Nov-Dec 2008
2. **Liangjun Zhang**, Young J. Kim, Dinesh Manocha, *Efficient Distance Computation in Configuration Space*, Computer Aided Geometric Design (CAGD special issue on SPM 07), Volume 25, Issue 7, 489-502, Oct 2008

3. **Liangjun Zhang**, Xin Huang, Young J. Kim, Dinesh Manocha, *D-Plan: Efficient Collision-Free Path Computation for Part Removal and Disassembly*, Journal of Computer-Aided Design and Applications, Volume 5, Issue 6, 774-786, 2008; International CAD Conference (CAD'08), **Best Paper Award**
4. **Liangjun Zhang**, Young J. Kim, Gokul Varadhan, Dinesh Manocha, *Generalized Penetration Depth Computation*, Computer-Aided Design (CAD special issue on SPM 06), Volume 39, Issue 8, 625-638, Aug 2007
5. Avneesh Sud, **Liangjun Zhang**, Mark Foskey, Dinesh Manocha, *Homotopy Preserving Approximate Voronoi Diagram of 3D*, Computer Graphics Forum special issue
1. **Liangjun Zhang**, Jia Pan, Dinesh Manocha, *Motion Planning of Human-Like Robots using Constrained Coordination*, The 9th IEEE-RAS International Conference on Humanoid Robots, Humanoids09, 2009, to appear
2. **Liangjun Zhang**, Jia Pan, Dinesh Manocha, *Motion Planning and Synthesis of Human-like Characters in Constrained Environments*, The Second International Workshop on Motion in Games (MIG), 2009 (invited paper)
3. **Liangjun Zhang**, Steven M. LaValle, Dinesh Manocha, *Global Vector Field Computation for Feedback Motion Planning*, IEEE International Conference on Robotics and Automation (ICRA09), 477-482, 2009
4. **Liangjun Zhang**, Dinesh Manocha, *Constrained Motion Interpolation with Distance Constraints*, International Workshop on the Algorithmic Foundations of Robotics (WAFR), 2008
5. **Liangjun Zhang**, Dinesh Manocha, *An Efficient Retraction-based RRT Planner*, IEEE International Conference on Robotics and Automation (ICRA), 3743-3750, 2008
6. **Liangjun Zhang**, Young J. Kim, Dinesh Manocha, *A Hybrid Approach for Complete Motion Planning*, IEEE/RSJ International Conference On Intelligent Robots and Systems (IROS), 7-14, 2007
7. **Liangjun Zhang**, Young J. Kim, Dinesh Manocha, *A Simple and Fast Algorithm for Generalized Penetration Depth Computation*, Robotics: Science and Systems Conference (RSS), 278-285, 2007
8. **Liangjun Zhang**, Young J. Kim, Dinesh Manocha, *C-DIST: Efficient Distance Computation for Rigid and Articulated Models in Configuration Space*, ACM Solid and Physical Modeling Symposium (SPM), 159-169, 2007
9. **Liangjun Zhang**, Young J. Kim, Dinesh Manocha, *A Simple Path Non-Existence Algorithm Using C-obstacle Query*, International Workshop on the Algorithmic Foundations of Robotics (WAFR), Springer Tracts in Advanced Robotics, 269-284, 2006
10. Gokul Varadhan, Shankar Krishnan, **Liangjun Zhang**, Dinesh Manocha, *Reliable Implicit Surface Polygonization using Visibility Mapping*, Eurographics Symposium on Geometry Processing (SGP), 211-221, 2006
11. Young J. Kim, **Liangjun Zhang**, Ming C. Lin, Dinesh Manocha, *Fast Penetration Depth Computation and its Applications*, Nicographics 2006 (invited paper)
12. **Liangjun Zhang**, Young J. Kim, Gokul Varadhan, Dinesh Manocha, *Generalized Penetration Depth Computation*, ACM Solid and Physical Modeling Symposium (SPM), 173-184, 2006
13. Xianfeng Gu, Song Zhang, **Liangjun Zhang**, Peisen S. Huang, Ralph Martin, and Shing-Tung Yau, *Holoimages*, ACM Solid and Physical Modeling Symposium (SPM), 129-138, 2006
14. **Liangjun Zhang**, Young J. Kim, Gokul Varadhan, Dinesh Manocha, *Fast C-obstacle Query Computation for Motion Planning*, IEEE International Conference on Robotics and Automation (ICRA), 3035-3040, 2006

Submitted Conference Paper

1. Jia Pan, **Liangjun Zhang**, Dinesh Manocha, *Retraction-Based RRT Planner for Articulated Models*, Department of Computer Science, UNC, Technical report, TR09-016, 2009
2. Jia Pan, **Liangjun Zhang**, Will Moss, Dinesh Manocha, Ming C. Lin, *A Hybrid Approach for Synthesizing Human Motion in Constrained Environments*, Department of Computer Science, UNC, Technical report, TR09-011, 2009

EXTERNAL
PRESENTATIONS

1. 7/2009: *Efficient Motion Planning using Generalized Penetration Depth Computation*, Computer Science and Artificial Intelligence Laboratory, MIT
2. 7/2009: *Efficient Motion Planning using Generalized Penetration Depth Computation*, Department of Computer Science, Stanford University
3. 05/2009: *Global Vector Field Computation for Feedback Motion Planning*, ICRA 2009, Kobe, Japan
4. 05/2009: *Whole-Body Motion Planning of Human-Like Robots and Applications to Virtual Prototyping*, ICRA Workshop on Humanoid Motion Planning in Real World, Kobe, Japan
5. 12/2008: *Constrained Motion Interpolation with Distance Constraints*, WAFR Conference, Mexico
6. 10/2008: *Efficient Motion Planning using Generalized Penetration Depth Computation*, Department of Computer Science, Prof. Steven LaValle's research group, University of Illinois at Urbana-Champaign, IL
7. 05/2008: *Contact Space Proximity and Planning Computations*, ICRA 2008 Workshop on Contact Models for Manipulation and Locomotion, Pasadena, CA
8. 05/2008: *An Efficient Retraction-based RRT Planner*, ICRA Conference 2008, Pasadena, CA
9. 11/2007: *Generalized Penetration Depth Computation and Applications to Robot Motion Planning*, Tenth SIAM Conference on Geometric Design & Computing, San Antonio, TX
10. 10/2007: *A Hybrid Approach for Complete Motion Planning*, IROS07, San Diego, CA
11. 06/2007: *A Fast and Practical Algorithm for Generalized Penetration Depth Computation*, RSS07, Atlanta, GA
12. 06/2007: *C-DIST: Efficient Distance Computation for Rigid and Articulated Models in Configuration Space*, SPM06, Beijing, China
13. 07/2006: *A Simple Path Non-Existence Algorithm Using C-obstacle Query*, WAFR06, New York City, NY
14. 05/2006: *Fast C-obstacle Query Computation for Motion Planning*, ICRA06, Orlando, FL

WORKING
EXPERIENCE

Architecture Engineer, S3 Graphics Ltd., Shanghai, China **Apr 2003 - Jan 2004**
Worked on the software-level modeling for graphics processing unit (GPU); *Texture Mapping* model.

TEACHING
EXPERIENCE

Instructor, UNC Chapel-Hill **Jun 2008 - Jul 2008**
Taught an undergraduate course on Introduction to Programming (Java);
Course website: <http://www.cs.unc.edu/~zlj/comp110/>
Developed syllabus, course material, lectures, recitations;
Presented lectures, graded assignments, quizzes and exams, handled students' questions.

AWARDS	NSF Computing Innovation Fellow (60 recipients nationally, http://cifellows.org/); being hosted by Stanford University	2009-2010
	Chinese government award for outstanding Ph.D. students abroad over all research areas, the only recipient from UNC	2008
	Best paper award, International CAD Conference	2008
	WAFR 2006 student travel grant	2006
	NSF Design, Service, & Manufacturing Grantees and Research Conf., Student Travel Grant	2006
	Graduation with honor, Zhejiang Province, top 5% in Zhejiang University	2000
	Honor program - Zhejiang University Advanced Class of Engineering Education	1997-2000
	Huawei scholarship	1999
	Zhengtai scholarship	1998
	Merits scholarships, Zhejiang University, consecutive 6 years	1996-2002

ACADEMIC SERVICE	Conferences reviewer: ICRA06, ICRA07, ICRA08, ICRA09, ICRA10, IROS08
	Journal reviewer: Computer Aided Geometric Design (CAGD), IEEE Robotics and Automation Society (RAS) Magazine, IEEE Transactions on Robotics, IEEE Transactions on Automation Science and Engineering, Journal of Intelligent and Robotic Systems, Journal of Robotics

REFERENCES	Available upon request
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