

# Jeff M Phillips

http://www.cs.duke.edu/~jeffp — jeffp@cs.duke.edu  
D101 LSRC Building, Research Drive, Durham, NC 27708 — (919) 660-4008

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## Education:

Duke University.  
Fifth year Computer Science doctoral student. Advisor: Dr. Pankaj Agarwal.  
Expected graduation: Fall 2008.

Rice University.  
Bachelor of Science in Computer Science, May 2003.  
Bachelor of Arts in Mathematics, May 2003.

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## Research Interests:

Computational Geometry, Computational Statistics, Data Mining, Databases, Robotics, Computational Structural Biology, Streaming Algorithms.

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## Research Experience:

Research Assistant, Duke University Computer Science Department.  
Algorithms for Discrete Geometry with Dr. Pankaj Agarwal. (2006 – present)  
Algorithms for Publish/Subscribe Databases with Dr. Jun Yang. (2006 – 2007)  
Geometric matching algorithms with Dr. Pankaj Agarwal and Dr. Carlo Tomasi. (2003 – 2007)  
Geometric analysis of Protein-Protein complexes with Dr. Pankaj Agarwal and Dr. Johannes Rudolph. (2004 – 2006)

Research Intern, Yahoo! Research.  
Algorithms for deterministic matrix subspace approximation with Dr. Michael Mahoney. (Summer 2007)

Visiting Researcher, AT&T-Research, Shannon Lab.  
Algorithms detecting spatial regions with statistically high discrepancy with Dr. Suresh Venkatasubramanian and Dr. Deepak Agarwal. (Summer/Winter 2005)

Research Assistant, Rice University, Computer Science Department.  
Algorithms for Motion Planning and Physical Simulation with Dr. Lydia Kavradi. (2000 – 2004)

Research Scientist, The Charles Stark Draper Laboratory, Inc.  
Guided Motion Planning and Refinement for Spacecraft Proximity Operations with Dr. Nazareth Bedrossian. (2002 – 2003)

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## Selected Publications: (all papers available on website)

Jeff M. Phillips. Algorithms for  $\epsilon$ -approximations of Terrains. International Colloquium on Automata, Languages and Programming, July 2008.

Bei Wang, Jeff M. Phillips, Robert Schreiber, Dennis Wilkinson, Nina Mishra, Robert E. Tarjan. Spatial Scan Statistics for Graph Clustering. SIAM International Conference on Data Mining, April 2008.

Badrish Chandramouli, Jeff M. Phillips, Jun Yang. Value-Based Notification Conditions in Large Publish/Subscribe Systems. International Conference on Very Large Data Bases, September 2007.

Jeff M. Phillips, Ran Liu, Carlo Tomasi. Outlier Robust ICP for Minimizing Fractional RMSD. International Conference on 3-D Digital Imaging and Modeling, August 2007. Poster/abstract Eurographics Symposium on Geometric Processing, June 2006.

Jeff M. Phillips, Johannes Rudolph, Pankaj K. Agarwal. Segmenting Motifs in Protein-Protein Interface Surfaces. Workshop on Algorithms in Bioinformatics, September 2006.

Deepak Agarwal, Andrew McGregor, Jeff M. Phillips, Suresh Venkatasubramanian, Zhengyuan Zhu. Spatial Scan Statistics: Approximations and Performance Study. ACM SIGKDD International Conference on Knowledge Discovery and Data, August 2006.

Pankaj K. Agarwal, Jeff M. Phillips. On Bipartite Matching under the RMS Distance. Canadian Conference on Computational Geometry, August 2006.

Deepak Agarwal, Jeff M. Phillips, Suresh Venkatasubramanian. The Hunting of the Bump: On Maximizing Statistical Discrepancy. SIAM-ACM Symposium on Discrete Algorithms, January 2006.

Jeff M Phillips, Nazareth Bedrossian, Lydia E. Kavradi. Guided Expansive Spaces Trees: A Search Technique for Motion- and Cost-Constrained State Spaces. *IEEE International Conference on Robotics and Automation*, April 2004.

Jeff Phillips, Andrew Ladd, Lydia E. Kavradi. Simulated Knot Tying. *IEEE International Conference on Robotics and Automation*, May 2002.

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**Software:** (available upon request)

Spatial Scan Statistics for Axis-Parallel Rectangles.

C code for detecting maximal discrepancy rectangles. Algorithms are exact or approximate on gridded or general position data.

Fractional ICP.

C code for aligning and visualizing point sets, curves, and surfaces using Fractional ICP. Multiple alignment.

Motif Segmentation for Protein-Protein Interface Surfaces.

C code for segmenting and visualizing structural motifs on interface surfaces. Integrated into MAPS: <http://biogeometry.cs.duke.edu/research/docking/>

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**Skills and Coursework:**

Computer Programming.

Extensive programming in C, C++, and Java in UNIX and Windows environments. Includes use of OpenGL, VRML, LAPACK. Experienced in HTML, Matlab, Mathematica. Team Programming.

Mathematics and Sciences.

Calculus, Linear Algebra, Number Theory, Abstract Algebra, Combinatorics, Differential Geometry, Topology, Markov Chains, Computational Geometry, Computational Topology, Shape Analysis, Probability and Statistics.

Computational Biology, Structural Biology. Coursework and lab work in Physics and Chemistry.

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**Research Fellowships:**

NSF Graduate Research Fellowship. (2004)

James B. Duke Fellowship. (2003)

C. S. Draper Laboratory Fellowship. (2003)

James S. Waters Creativity Award. (2002)

NASA/Texas Space Grant Consortium Undergraduate Scholarship. (2002)

Brown Undergraduate Research Internship Award. (May 2001, September 2001)

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**Service Activities and Honors:**

Graduate Student Representative, Duke Computer Science. (2006-2007)

Chair, Duke Computer Science Graduate Recruitment. (2004, 2005, 2006)

Organizing, Duke Computer Science Graduate Student Retreat. (2007-present)

Committee Member, Graduate Program Reevaluation. (2007-present)

Curator, Duke Computer Science Graduate Student Seminar. (2004 - 2007)

Co-Curator, Duke Computer Science Algorithms Seminar. (2005 - 2006)

Program Committee, Robotics: Science and Systems. (2006)

Teaching Assistant, Duke Computer Science Department: Artificial Intelligence. (2004)

Teaching Assistant, Duke Computer Science Department: Computer Vision. (2004)

Who's Who Among Students in American Universities & Colleges. (2000/2001)

Executive Vice President, Jones Residential College, Rice University. (2001/2002)

Outstanding Departmental Service Award, Duke Computer Science Department. (2006)

President, Rice Society of Computer Scientists. (2002/2003)

Vice President's Appreciation Award for Community Service. (2001)