Jeff M. Phillips

http://www.cs.duke.edu/~jeffp — jeffp@cs.duke.edu
Box 90129, Durham, NC 27708-0129 — (919) 660-6596

Education

Duke University

Ph.D. in Computer Science, January, 2009.
Thesis Title: *Small and Stable Descriptors of Distributions for Geometric Statistical Problems*.
Advisor: Pankaj K. Agarwal.

Rice University

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

Research Interests

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

Research Experience

Duke University, Department of Computer Science (Postdoctoral Associate) (2009-present)

Supervisor: Pankaj K. Agarwal. Worked on computational geometry for geospatial analysis.

Duke University, Department of Computer Science (Research Assistant) (2003-2009)

Advisor: Pankaj K. Agarwal. Worked on computational geometry (coresets, shape matching), computational statistics, computational biology, databases.

Yahoo! Research (Research Intern) (Summer 2007)

Advisor: Michael Mahoney. Worked on geometric interpretations of high dimensional data sets.

AT&T Research (Visiting Researcher) (Summer/Winter 2005)

Advisor: Suresh Venkatasubramanian. Worked on computational statistics and data mining.

Rice University, Department of Computer Science (Research Assistant) (2000-2003)

Advisor: Lydia E. Kavraki. Worked on robotic path planning and physical simulation.

The Charles Stark Draper Laboratory, Inc. (Research Scientist) (2002-2003)

Advisor: Nazareth Bedrossian. Worked on path planning for space shuttle navigation.

Fellowships and Awards

Best Student Paper at International Conference on Automata, Languages and Programming. (2008)
Distinguished Department Service Award (Duke Computer Science). (2008)

For 5 years of department service — never before awarded

Outstanding Department Service Award (Duke Computer Science). (2006)
NSF Graduate Research Fellowship. (2004-2007)

3 year full graduate fellowship

James B. Duke Fellowship. (2003-2007)

4 years partial Duke graduate fellowship

C. S. Draper Laboratory Fellowship. (2003-2007)

4 year full graduate fellowship — declined

James S. Waters Creativity Award. (2002)

Annual Rice Undergraduate Research Award

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

Annual National Undergraduate Research Award

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

Rice Undergraduate Research Award, won twice

Who's Who Among Students in American Universities & Colleges. (2002)

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

Selected Publications (available on webpage)

[P1] An Efficient Algorithm for Euclidean 2-Center with Outliers.
Pankaj K. Agarwal and Jeff M. Phillips. *16th Annual European Symposium on Algorithms (ESA)*, September, 2008.

[P2] Algorithms for ε-Approximations of Terrains. **Best Student Paper.**
Jeff M. Phillips. *International Colloquium on Automata, Languages and Programming (ICALP)*, July 2008.

[P3] Spatial Scan Statistics for Graph Clustering.
Bei Wang, Jeff M. Phillips, Robert Schreiber, Dennis Wilkinson, Nina Mishra, and Robert E. Tarjan. *SIAM International Conference on Data Mining (SDM)*, April 2008.

[P4] Value-Based Notification Conditions in Large Publish/Subscribe Systems.
Badrish Chandramoulli, Jeff M. Phillips, and Jun Yang. *International Conference on Very Large Data Bases (VLDB)*, Septermber, 2007.

[P5] Outlier Robust ICP for Minimizing Fractional RMSD.
Jeff M. Phillips, Ran Liu, and Carlo Tomasi. *International Conference on 3-D Digital Imaging and Modeling (3DIM)*, August 2007.
Poster/abstract in *Eurographics Symposium on Geometric Processing (SGP)*, June 2006.

[P6] Segmenting Motifs in Protein-Protein Interface Surfaces.
Jeff M. Phillips Johannes Rudolph, and Pankaj K. Agarwal. *Workshop on Algorithms in Bioinformatics (WABI)*, September 2006.

[P7] Spatial Scan Statistics: Approximations and Performance Study.
Deepak Agarwal, Andrew McGregor, Jeff M. Phillips, Suresh Venkatasubramanian, and Zhengyuan Zhu. *ACM SIGKDD International Conference on Knowledge Discovery and Data (KDD)*, August 2006.

[P8] On Bipartite Matching under the RMS Distance.
Pankaj K. Agarwal and Jeff M. Phillips. *Canadian Conference on Computational Geometry (CCCG)*, August 2006.

[P9] Hunting of the Bump: On Maximizing Statistical Discrepancy.
Deepak Agarwal, Jeff M. Phillips, and Suresh Venkatasubramanian. *SIAM-ACM Symposium on Discrete Algorithms (SODA)*, January 2006.

[P10] Guided Expansive Spaces Trees: A Search Technique for Motion- and Cost-Constrainted State Spaces.
Jeff M. Phillips, Nazareth Bedrossian, and Lydia E. Kavraki. *IEEE International Conference on Robotics and Automation (ICRA)*, April 2004.

[P11] Simulated Knot Tying.
Jeff M. Phillips, Andrew Ladd, and Lydia E. Kavraki. *IEEE International Conference on Robotics and Automation (ICRA)*, May 2002.

Manuscripts (available upon request)

[M12] Shape Fitting on Point Sets with Probability Distributions.
Maarten Löffler and Jeff M. Phillips. *Manuscript*, December, 2008.

[M13] Stability of ε-Kernels.
Pankaj K. Agarwal, Jeff M. Phillips, and Hai Yu. *Manuscript*, December, 2008.

[M14] Lipschitz Unimodal and Isotonic Regression on Paths and Trees.
Pankaj K. Agarwal, Jeff M. Phillips, and Bardia Sadri. *Manuscript*, December, 2008.

[M15] Near-Linear Time, Deterministic ε-Quantizations in One Dimension.
Jeff M. Phillips. *Manuscript*, December, 2008.

Scientific 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.

Motifs 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/

Invited Talks

Conference Presentations

European Symposium on Algorithms (2008)
International Colloquium on Automata, Languages, and Programming (2008)
International Conference on 3-D Digital Imaging and Modeling (2007)
Workshop on Algorithms in Bioinformatics (2006)
ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (2006)
Canadian Conference on Computational Geometry (2006)
ACM-SIAM Symposium on Discrete Algorithms (2006)
AIAA Guidance, Navigation, and Control (2003)
AAS/AIAA Space Flight Mechanics Meeting (2003)
IEEE International Conference on Robotics and Automation (2002,2004)

Invited Seminars

MADALGO, University of Aarhus, Denmark (2008)
Statistical and Applied Mathematical Sciences Institute, RTP, NC (2006)
AT&T: Shannon Labs, Florham Park, NJ (2005)
Duke University, Durham, NC

Algorithms Seminar (2003,2005,2006,2008)
Duke Robotics, Intelligence, and Vision (2004,2006,2007,2008,2009)
Biogeometry (2005)
Visualization Forum (2004,2005,2009)

NASA, Johnson Space Center, TX (2003)
Draper Laboratories, Cambridge, MA (2002)

Teaching

Teaching Assistant, Duke Computer Science: Artificial Intellegence. (2004)
Teaching Assistant, Duke Computer Science: Computer Vision. (2004)
Guest Lectures: Computational Geometry, Artificial Intelligence, Shape Analysis.
Guest Speaker: Talent Identification Program. (2008)

Summer school in robotics for talented high school students

Service Activities

Duke Computer Science Department

Graduate Student Representative. (2006-2007)
Chair, Graduate Recruitment. (2004, 2005, 2006)
Organizer, Duke Computer Science Graduate Student Retreat. (2008)

Proposed, developed, and led first ever graduate student 3-day retreat for Duke computer science

Committee Member, Graduate Program Reevaluation. (2007-present)
Curator, Triseminar. (2004-2007)

Organized and led discussions in weekly graduate student-only research seminar

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

Rice University

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

Helped start *CSters*: women in computer science group.
Restarted ACM Programming Team.

Executive Vice President, Jones Residential College. (2001-2002)

External Service

Program Committee, *Robotics: Science and Systems*. (2006)
Reviewer, *Computational Geometry: Theory and Applications*, *SoCG*, *SoDA*, *ESA*, *APPROX*, *PODS*, *WADS*, *BMC Systems Biology*

References

Available upon request.

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