John C. Bowers

bowersjc@jmu.edu

540-568-8771

ISAT / CS Building, Room 217

http://cs.umass.edu/~jbowers

James Madison University

Department of Computer Science - MSC 4103

701 Carrier Drive

Harrisonburg, VA 22807

EDUCATION

2015   **PhD**   **University of Massachusetts Amherst**
Computer Science
Dissertation: "Skeleton Structures and Origami Design"
Committee: Dr. Ileana Streinu (c), Dr. Andrew McGregor,
               Dr. Gerome Miklau, Dr. Tom Braden

2012   **MS**   **University of Massachusetts Amherst**
Computer Science
Passed PhD candidate portfolio with distinction
Phi kappa phi

2008   **BS**   **The Florida State University**
Computer Science (with double major in Mathematics)
With honors
Summa cum laude
Phi beta kappa
Upsilon pi epsilon
Pi mu epsilon

HONORS AND AWARDS

2010-2013.   National Science Foundation Graduate Research Fellowship.

2007.   Barry M. Goldwater Scholarship, Honorable Mention.

2006.   MCI Scholarship, The Florida State University.

2004-2006.   Harris Scholar, The Florida State University.

TEACHING EXPERIENCE

Teaching Assistant for Smith College: Computational Geometry   Spring 2015

I will assist Ileana Streinu in teaching Computational Geometry, which will include giving lectures, developing and grading homework and exams, and holding office hours.

Teaching Assistant for Smith College: Algorithms   Spring 2014

Gave lectures, co-developed and graded homework and exams, held office hours, and developed and presented a tutorial on mathematical induction for Algorithms (11 students, Professor: Ileana Streinu).

Teaching Assistant for UMass: Programming with Data Structures   Summer 2013

Graded programming assignments and exams, interacted regularly with students on the online message board Piazza, and provided in person weekly tutoring for Programming with Data Structures (Java, ~50 students, Professor: Timothy Richards).

Teaching Assistant for UMass: Computer Graphics   Fall 2009

Graded programming assignments and held office hours for Introduction to Computer Graphics (Java and OpenGL, ~15 students, Professor: Rui Wang).

Undergraduate Mentoring

2014.	Mentored three undergraduate students in the Linkage Lab on summer research projects.
2011.	Mentored summer REU student Jonathan Leahey (see publication [7]).

Graduate Mentoring

2014– 2015.	Mentoring graduate students in the LinkageLab on Fall research project.

RESEARCH EXPERIENCE

2013-2015.	Research Assistant. University of Massachusetts, Amherst. Advisor: Ileana Streinu.
2010-2013.	NSF Graduate Research Fellow. University of Massachusetts, Amherst. Advisor: Ileana Streinu.
2009-2010.	Research Assistant. University of Massachusetts, Amherst. Advisor: Rui Wang.
2006-2008.	Undergraduate Research Assistant. Florida State University. Advisor: Washington Mio.
2006.	Undergraduate Research Assistant. Florida State University. Advisor: Alec Yasinsac

PUBLICATIONS

Manuscripts Submitted

[1] (with Ileana Streinu) "Geodesic Universal Molecules." Submitted, 2015.

[2] "Faster Reductions for Straight Skeletons to Motorcycle Graphs." Submitted, 2014. ArXiV Preprint: arxiv.org/abs/1405.6260.

Published (Refereed)

[3] (with Ileana Streinu) "Lang's Universal molecule algorithm." *Annals of Mathematics and Artificial Intelligence*, 74(3-4), 371-400, 2015.

[4] (with Rose Therail John and Ileana Streinu) " Managing Reproducible Computational Experiments with Curated Proteins in KINARI-2." In *Proceedings 11th Intl. Symp. on Bioinformatics Research and Applications, 2015 (ISBRA'15)*.

[5] (with Ileana Streinu) "Computing Origami Universal Molecules with Cyclic Tournament Forests." In *Proc. 15th Intern. Symp. on Symbolic and Numeric Algorithms for Scientific Computing* (SYNASC'13), Timisoara, Romania, 23-26 Sept., 2013.

[6] (with Ileana Streinu). "Rigidity of Origami Universal Molecules." In *Automated Deduction in Geometry*, Lecture Notes in Computer Science 7993, 120-142, Springer Verlag, 2013.

[7] (with Ileana Streinu) "Lang's Universal Molecule Algorithm (Video)." In *Proc. 28th Symp. Computational Geometry* (SOCG'12), 419-420, 2012.

[8] (with Ileana Streinu). "Rigid Origami designs with Lang's Universal Molecule algorithm." In *Proc. Automated Deduction in Geometry* (ADG'12), September 2012.

[9] (with Jonathan Leahey and Rui Wang) "A Ray Tracing Approach to Diffusion Curves." *Computer Graphics Forum* 30(4) (EGSR 2011), 2011.

[10] (with Rui Wang, Li-Yi Wei, and David Maletz) "Parallel Poisson Disk Sampling with Spectrum Analysis on Surfaces." In *ACM SIGGRAPH Conference and Exhibition on Computer Graphics and Interactive Techniques in Asia* (SIGGRAPH Asia '10), 2010.

[11] (with Washington Mio and Xuiwen Liu) "Shape of Elastic Strings in Euclidean Space: An Infinite-Dimensional Family of Metrics." *International Journal of Computer Vision* (IJCV) Vol. 82(1), April 2009, 96-112

[12] (with Washington Mio, Monica Hurdal, and Xuiwen Liu) "Modeling Brain Anatomy with 3D Arrangements of Curves." In *Proc. Workshop on Mathematical Methods in Biomedical Image Analysis* (MMBIA), Rio de Janeiro, Brazil, 2007.

[13] (with Xuiwen Liu and Washington Mio) "Parametrization, Alignment and Shape of Spherical Surfaces." In *Proc. 2nd International Conference on Computer Vision Theory and Applications* (VISAPP), Barcelona, Spain, Vol. 1, 2007, 199-206

Technical Reports

[14] (with David Maletz and Rui Wang) "Reflectance Filtering for Interactive Global Illumination in Semi-Glossy Scenes." UMass Technical Report UM-CS-2009-057, 2009.

INVITED TALKS

[1] "Lang's Universal Molecule Algorithm." Undergraduate Mathematics Colloquium. University of Tennessee, Department of Mathematics. Nov. 13, 2014.

[2] "Lang's Universal Molecule Algorithm." Special session on discrete structures in classical geometry, AMS Regional Meeting in Greensboro, NC, Nov. 8-9, 2014.

[3] "Rigidity of Origami." Undergraduate Mathematics Colloquium. University of Tennessee, Department of Mathematics. April 5, 2013.

WORKSHOP PRESENTATIONS

[1] Faster Reductions from Straight Skeletons to Motorcycle Graphs. The 24th Fall Workshop on Computational Geometry (FWCG'14), Storrs, CT, Nov. 1, 2014.

DEMOS

[1] (with Ileana Streinu) "Lang's Universal Molecule Algorithm", video presentation, 28th ACM Symposium on Computational Geometry (SOCG'12), Univ. of North Carolina at Chapel Hill, June 2012.

SERVICE

- Co-organizer for weekly departmental Monday morning social hour. Fall 2010 and Fall 2013.

- Publicity Chair, ACM SIGGRAPH i3D Conference, 2011.

- Peer reviewer for Computer Graphics Forum and ACM SIGGRAPH Asia.

- Assisted in peer-review process on ~40 papers under Ileana Streinu.

DEPARTMENTAL TALKS

[1] "Faster Reductions from Straight Skeletons to Motorcycle Graphs." Theory Seminar. Oct. 21, 2014.

[2] "Lang's Universal Molecule Algorithm." Theory Seminar. Dec. 6, 2011.

[3] "A Raytracing Approach to Diffusion Curves." Invited Talk to Summer REU Colloquium. 2011.

[4] "Parallel Poisson Disc Sampling." Invited Talk to Summer REU Colloquium. 2010.

OTHER EDUCATIONAL OUTREACH

"A Raytracing Approach to Diffusion Curves." Invited tutorial at Science Quest, an educational workshop for high-school students. Co-sponsored by UMass and the Commonwealth Alliance for Information Technology Education. October 15, 2011.

SOFTWARE

- "Rigidity and Origami." Video, educational website, and online software demo, `http://linkage.cs.umass.edu/langOrigami`. Work with Ileana Streinu.

- "sketchqt.exe." Software for producing diffusion curve drawings using a CUDA based ray-tracer. `http://graphics.cs.umass.edu/pubs/egsr_2011_diff_demo.zip`. Work with Rui Wang.

- "poisson.exe." Software demo for drawing poisson samples from a surface on the GPU using CUDA. `http://graphics.cs.umass.edu/pubs/sa_2010_demo.zip`. Work with Rui Wang.

PROFESSIONAL AFFILIATIONS

- Association for Computing Machinery (including membership in SIGCSE)

- American Mathematical Society