

Lance Edward Miller

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RESEARCH INTERESTS Algebra/Number Theory (Witt-Burnside Rings)
Computational Geometry and Topology (Manifold Approximation)

EDUCATION **University of Connecticut**, Storrs, CT
Ph.D. Mathematics, Expected May 2010
- Title: "On the Structure of Witt-Burnside Rings"
- Advisor: Dr. Keith Conrad
Ph.D. Computer Science, December 2009
- Title: "Discrepancy and Isotopy for Manifold Approximation"
- Advisors: Dr. Thomas J. Peters, Dr. Alexander Russell
M.S. Mathematics, May 2005

New Mexico State University, Las Cruces, NM

B.S. Mathematics, May, 2003
B.S. Computer Science, August 2003

AWARDS IBM Ph.D. Fellowship 2006, 2007
University Predoctoral Fellowship 2003, 2004, 2006
University of Connecticut, Department of Mathematics, Community Service Award 2006
Finalist Nominee Outstanding Graduate/Teaching Assistant Student Life Award 2005

PUBLICATIONS 1. *Group Gradings in Incidence Algebras* with E. Spiegel, Communications in Algebra (to appear).
2. *Geometric Topology and Visualizing 1-Manifolds* with K.E. Jordan, T.J. Peters, A.C. Russell, Topological Data Analysis and Visualization: Theory, Algorithms and Applications (to appear).
3. *Modeling Time and Topology for Animation and Visualization with Examples on Parametric Geometry* with K.E. Jordan, E.L.F. Moore, T.J. Peters, A.C. Russell, Theoretical Computer Science, 405, (2008) 41-49, 7.
4. *Topological Neighborhoods for Spline Curves: Practice and Theory* with E.L.F. Moore, T.J. Peters, A.C. Russell, Lecture Notes in Computer Science, 5045,(2008) 149-161.
5. *Breadth First Search Graph Partitions and Concept Lattices* with J.Abello, A.Pogel, Journal of Universal Computer Science 10(8)(2004) 934-954.
6. *Visualization of Concept Lattices using Weight Functions* with A.Pogel, T.Hannan, Conceptual Structures at Work: Contributions to the 12th International Conference on Conceptual Structures (ICCS 2004), p.1-15, Huntsville, AL, Shaker, 19-23 July, 2004.

PAPERS IN PREPARATION • *On the Structure of Witt-Burnside Rings*
• *Efficient Piecewise-linear Surface Approximations via Discrepancy* with A.C. Russell and T.J. Peters

ACADEMIC
EXPERIENCE

University of Connecticut: Dept. of Mathematics, Storrs, CT USA

Teaching Assistant

August 2003 - present

- Instructor of record for 12 courses including: Linear Algebra, Differential Equations, Single and Multivariable Calculus, Business Mathematics
- Developed and taught an online version of Business Mathematics
- Lectured for BRIDGE: Engineering Program for incoming minority students

University of Connecticut: Dept. of Computer Science, Storrs, CT

Research Assistant

August 2006 - May 2007

Partially supported by NSF to study ring theory, splines and computational topology in support of visualization for simulations on IBM Blue Gene/L architecture.

Physical Science Laboratory: New Mexico State University, Las Cruces, NM, USA

Research Assistant

May 2000 - August 2003

Developed applications and applying Lattice Theory/Formal Concept Analysis to agent simulations. Wrote Java software for computation and visualization.

CONFERENCE
PRESENTATIONS

- SIAM MI07 Conference of Mathematics for Industry, Philadelphia: Adaptive Approximations of Curves and Surfaces, 2007.
- Invited talk AGMOCR, Storrs, CT: Group Gradings in Incidence Algebras, 2007.
- 16th Fall Workshop on Computational Geometry, Smith College, Northampton, MA: Optimal Covers for Computational Topology on Parametric Curves, 2006.
- AMS Eastern Section Meeting, Storrs, CT: Adaptive Methods for the Computation of Open Covers on Compact Curves, 2006.
- AMS Eastern Section Meeting, Storrs, CT: Group Gradings in Incidence Algebras, 2006.
- MAA Eastern Section Meeting, Durham, NH: Group Gradings of Matrix Algebras and Incidence Algebras, 2005.
- AMS-MAA Annual Meeting, Phoenix, AZ: Visualizations of Weighted Lattices for Formal Concept Analysis, 2003.

PROFESSIONAL
EXPERIENCE

International Business Machines, Cambridge, MA

Researcher Intern

May 2006 - August 2007

Developed concepts and code for high performance visualization on IBM Blue Gene/L architecture and systems level high performance acceleration. Work resulted in a white paper on systems level acceleration.

SERVICE

- University of Connecticut Graduate Seminar Organizer: 2003-2005, 2006
- University of Connecticut Mentor Connection Program (High School Gifted and Talented), Mathematics Site Mentor: 2003, 2004
- University of Connecticut Math Department Teaching Assistant Mentor: 2004-2008
- Local Coordination Committee AGMOCR 2007 Conference
- Multiple talks given in Graduate and Algebra seminars at the University of Connecticut

PROGRAMMING
EXPERIENCE

- Three years of coding experience in C and Java (with Physical Science Laboratories). This included both updating existing projects and writing prototypes.
- Proficient in C/C++ and Java.
- Updated/contributed to projects involving Fortran, C#, SQL, PHP, Ruby and Python. I am also proficient with Maple, GAP, and Sage.