

# CURRICULUM VITAE

Ankur Gupta

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## Education

**Doctor of Philosophy (Computer Science)**  
Duke University (Advisor: Jeffrey Scott Vitter)  
Thesis: Succinct Data Structures

Graduation Date: December 2007

**Master of Science in Computer Science**  
The University of Texas at Dallas

Graduation Date: May 2000

**Bachelor of Science in Computer Science**  
The University of Texas at Dallas (Thesis advisor: Dr. William Pervin)

Graduation Date: May 2000  
*Summa Cum Laude*

**Bachelor of Science in Mathematical Sciences**  
The University of Texas at Dallas (Thesis advisor: Dr. John Van Ness)

Graduation Date: May 2000  
*Summa Cum Laude*

## Honors and Awards

National Science and Engineering Research Council of Canada (NSERC) Scholarship Winner, 2000-2001

Excellence in Teaching Assistantship in 1998-1999 and 1999-2000

College Master's Award for Excellence in Computer Science

Best Undergraduate Thesis Paper Award

Collegium V honors graduate

Robert C. Byrd Scholar

## Publications

Paolo Ferragina, Roberto Grossi, Ankur Gupta, Rahul Shah, and Jeffrey Scott Vitter. **On Searching Compressed String Collections Cache-Obliviously**. In *Proceedings of the ACM Conference on Principles of Database Systems (PODS)*, Vancouver, Canada, May 2008.

Roberto Grossi, Ankur Gupta, and Jeffrey Scott Vitter. **Nearly Tight Bounds on the Encoding Length of the Burrows-Wheeler Transform**. In *Proceedings of the ACM-SIAM Workshop on Analytic Algorithmics and Combinatorics (ANALCO)*, San Francisco, CA, January 2008.

Alexander Golynski, Roberto Grossi, Ankur Gupta, Rajeev Raman, and Srinivasa Rao. **On the Size of Succinct Indices**. In *Proceedings of European Symposium on Algorithms (ESA)*, Eilat, Israel, October, 2007.

Ankur Gupta, Wing-Kai Hon, Rahul Shah, and Jeffrey Scott Vitter. **A Framework for Dynamizing Succinct Data Structures**. In *Proceedings of International Colloquium on Automata, Languages, and Programming (ICALP)*, Wroclaw, Poland, July 2007.

Ankur Gupta, Wing-Kai Hon, Rahul Shah, and Jeffrey Scott Vitter. **Compressed Data Structures: Dictionaries and Data-Aware Measures**. In *Proceedings of Theoretical Computer Science (TCS)*, January 2007.

Roberto Grossi, Ankur Gupta, and Jeffrey Scott Vitter. **When Indexing Equals Compression: Experiments With Compressing Suffix Arrays and Applications**. In *Proceedings of the ACM Transactions on Algorithms (TALG)*, January 2007.

Ankur Gupta, Wing-Kai Hon, Rahul Shah, and Jeffrey Scott Vitter. **Compressed Dictionaries: Space Measures, Data Sets, and Experiments**. In *Proceedings of the Workshop on Experimental and Efficient Algorithms (WEA)*, Menorca, Spain, May 2006.

Ankur Gupta, Wing-Kai Hon, Rahul Shah, and Jeffrey Scott Vitter. **Fully Indexable Data-Aware Dictionaries**. In *Proceedings of the IEEE Data Compression Conference (DCC)*, Snowbird, UT, March 2006.

Luca Foschini, Roberto Grossi, Ankur Gupta, and Jeffrey Scott Vitter. **Fast Compression With a Static Model in High-Order Entropy**. In *Proceedings of the IEEE Data Compression Conference (DCC)*, Snowbird, UT, March 2004.

Roberto Grossi, Ankur Gupta, and Jeffrey Scott Vitter. **When Indexing Equals Compression: Experiments With Compressing Suffix Arrays and Applications**. In *Proceedings of the ACM-SIAM Symposium on Discrete Algorithms (SODA)*, New Orleans, LA, January 2004.

Roberto Grossi, Ankur Gupta, and Jeffrey Scott Vitter. **High-Order Entropy-Compressed Text Indexes**. In *Proceedings of the ACM-SIAM Symposium on Discrete Algorithms (SODA)*, Baltimore, MD, January 2003.

## Submitted Work and Technical Reports

Roberto Grossi, Ankur Gupta, and Jeffrey Scott Vitter. **High-Order Entropy-Compressed Text Indexes**. In journal submission. December 2005.

Ankur Gupta. **Finite Modulo Difference Covers**. UT Dallas Tech Report. March 2000.

## Presentations and Talks Not Included in Conferences

**Succinct Data Structures**. Invited talk at the *Department of Computer Science and Mathematics* at St. Louis University, Saint Louis, MO, March 2007.

**Entropy-Compressed Indexes for Multidimensional Pattern Matching**. Presented during the *Burrows-Wheeler Transform: Ten Years Later* at the *Center for Discrete Mathematics and Theoretical Computer Science* in August 2004.

**High-Order Entropy Analysis of Compressed Suffix Arrays**. Presented during the *Data Compression in Networks and Applications Workshop* at the *Center for Discrete Mathematics and Theoretical Computer Science* in March 2002.

## Grants

Ankur Gupta. **Wisdom is Compression: Data Compression as a Mathematical Measure of Wisdom.** *Advancing a New Interdisciplinary Study of Wisdom (Arete Initiative).* University of Chicago. October 2008—September 2008. \$90,000.

Ankur Gupta and Jon Sorenson. **Selection to Sort.** *Holcolm Faculty Research Award.* Butler University. May 2008—August 2008. \$9,200.

## Employment

**Assistant Professor** August 2008–present  
**Butler University**  
Teach various courses in Computer Science and continue an active research program.

**Lecturer** August 2007–August 2008  
**Butler University**  
Teach various courses in Computer Science and continue an active research program.

**Visiting Research Assistant** August 2003–August 2007  
**Purdue University**  
Develop space-efficient algorithms for text indexing, dictionary structures, and other important (dynamic) data structures, such as priority queues and union/find data structures. Develop algorithms in a number of settings, including I/O (cache aware and cache oblivious) and streaming environments. Natural applications include bioinformatics and data mining.

**Instructor of Computer Science (Discrete Mathematics II)** June 2000–September 2000  
**The University of Texas at Dallas**  
I taught the junior level course CS 3305, Discrete Math II, covering recurrence relations, graph theory, trees, and graph algorithms. My duties included designing a syllabus and all related course materials.

**Teaching Assistant and Senior Mentor** September 1997–May 2000  
**The University of Texas at Dallas**  
I taught in various capacities throughout the university, including Calculus I and II, introductory programming courses, algorithms, and abstract algebra.

**Contract Basis Programmer (Device Drivers and Security Issues)** December 1998–May 1999  
**Anvik Corporation**  
I designed device drivers for an error-prone robot used for laser-light lithography. The robot had to be taught how to pick up fragile sheets of silicone and drill holes micrometers apart. It then had to be taught how to check its work. Device drivers operated both the arm and drill of the robot, as well as interpreted the camera-mounted data to verify that the work was done correctly. I additionally built a code base to support a password-protected database to allow technicians limited access to view device functionality, to facilitate remote deployment of the robot. The software had to be robust enough to serve as a protection for device software while patents were pending.

**Research Analyst and Statistical Programmer** February 1998–December 1999  
**Texas Schools Project (TSP) with the University of Texas at Dallas**  
This project, headed by (the late) Dr. John F. Kain, studies the impact of various educational programs implemented by the state in grade school by tracking state-administered standardized tests, high school grades, and other indicators through time for students in the Texas Public School System. I primarily

used regression analysis to determine trends, theorizing reasons for these trends, and testing them on small, controlled sample spaces.

## References

[In Alphabetical Order]

**Mr. Michael E. Durbin**

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Garland, TX 75043-1610 USA  
Phone: (972) 271-8779

**Dr. Roberto Grossi**

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Corso Italia 40  
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**Dr. Rahul Shah**

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**Dr. Xiaobai Sun**

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**Dr. Wojciech Szpankowski**

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**Dr. Jeffrey Scott Vitter**

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