

ZASHA WEINBERG

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EDUCATION

- Dept. of Computer Science & Engineering**, University of Washington Sept. 1999-present
Ph.D. in Computer Science, Computational Molecular Biology track, expected summer, 2005.
M.S. awarded December, 2001.
- Courant Institute of Mathematical Sciences**, New York University Sept. 1993-May 1995
B.A. in Computer Science (minor in German).
- Tisch School of the Arts**, New York University Sept. 1991-May 1993
Studied in the Dramatic Writing Program.

EXPERIENCE

- Research Assistant**, *Dept. of Computer Science & Engineering, University of Washington.*
Seattle, WA Jan. 2001-present
Dissertation: Accurate annotation of non-coding RNAs in practical time.
Advisor: Walter L. Ruzzo.
Designed techniques to improve the speed of covariance model (CM) searches by two orders of magnitude with mathematical guarantees that no accuracy is lost in the faster algorithm. This enables highly accurate annotation of non-coding RNAs (functional RNA molecules not coding for proteins) using CMs in a practical amount of time, compared to CPU years necessary for a raw CM. A suite of techniques enables highly accurate scans for the vast majority of non-coding RNA families. For the remainder, I designed heuristic techniques whose accuracy is superior to previous heuristic techniques. Collaborated with Prof. Ronald Breaker (Dept. of Molecular, Cellular & Developmental Biology, Yale University) to find additional examples of candidate riboswitch RNA families.
With Prof. M.K. Raghuraman (Dept. of Genome Sciences, University of Washington), created simulator of experiment to study chromosome replication dynamics in yeast. The simulator is used to design and analyze experiments.
- Intern**, *ZymoGenetics, Inc.*
Seattle, WA June 2002-Sept 2002
Investigated a hypothesis about how Newtonian mechanics may influence protein binding dynamics, specifically that ligands will tend to lie on the protein's principal axes of inertia. Designed & analyzed statistical tests using data from the Protein Data Bank.
- Summer Student**, *Fields Lab, Dept. of Genome Sciences, University of Washington.*
Seattle, WA June 2000-Sept 2000
Did wet lab work to assist Dr. Peter Uetz in his post-doc work to screen for yeast protein-protein interactions using the yeast two-hybrid system.

- Teaching Assistant**, *Dept. of Computer Science & Engineering, University of Washington.*
Seattle, WA Sept. 1999-Dec. 2000
CSE 326 (Data structures & algorithms), CSE 401 & 413 (Compilers / programming languages),
CSE 531 (Graduate theory of computation): led quiz sections, grading, office hours.
- Independent researcher**
New York, NY Oct. 1998-Sept. 1999
Synthesizing Arbitrary Genomes with Prof. Dennis Shasha (New York University). Co-developed
a novel technique that in theory can synthesize arbitrary-length DNA.
- Independent researcher**
New York, NY Nov. 1997-July 1998
Approximate Patterns in Graphs with Prof. Jason Tsong-Li Wang (New Jersey Institute of Technol-
ogy). Evaluated technique for finding motifs in graphs, and created system to visualize results.
Applications: chemical graphs, the Web, natural language processing.
- Manager of Engineering**, *Nicholson NY, LLC.*
New York, NY June 1998-July 1999
Managed 10-person engineering department.
- Senior Engineer**, *Nicholson NY, LLC.*
New York, NY Feb. 1997-June 1998
- Software Engineer**, *Nicholson NY, LLC.*
New York, NY Jan. 1996-Feb. 1997
- Programmer**, *Music Pen, Inc.*
New York, NY June 1995-Dec. 1995
- Summer Student**, *Dept. of Psychiatric Neurogenetics, Clarke Institute of Psychiatry*
Toronto, Canada June 1994-Aug. 1994

PUBLICATIONS

Peer-reviewed

- M. Mandal, M. Lee, J.E. Barrick, **Z. Weinberg**, G.M. Emilsson, W.L. Ruzzo and R.R. Breaker
(2004) A glycine-dependent riboswitch that uses cooperative binding to control gene expres-
sion, *Science*, 306: 275-279.
- Z. Weinberg** and W.L. Ruzzo (2004) Exploiting conserved structure for faster annotation of non-
coding RNAs without loss of accuracy, *12th International Conference on Intelligent Systems
for Molecular Biology (ISMB) and Bioinformatics*, 20 (suppl. 1): i334-i341.
- Z. Weinberg** and W.L. Ruzzo (2004) Faster genome annotation of non-coding RNA families with-
out loss of accuracy, *Proc. Eighth Annual Inter. Conf. on Computational Molecular Biology
(RECOMB)*, ACM Press, pp. 243-251.
- J. T.-L. Wang, X. Wang, D. Shasha, B.A. Shapiro, K. Zhang, X. Zheng, Q. Ma and **Z. Weinberg**
(2000) An approximate search engine for structural databases, *SIGMOD Conference 2000*: 584.

Submitted

- Z. Weinberg**, J.E. Barrick, R.R. Breaker and W.L. Ruzzo (2005) Practical-time detection of highly
diverged non-coding RNAs with anomalous structures, *submitted*.

Z. Weinberg and W.L. Ruzzo (2005) Sequence-based heuristics for faster annotation of non-coding RNA families, *submitted*.

Last updated: February, 2005.