

Rebecca L. Collins

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EDUCATION

Columbia University

- Ph.D. student, Computer Science 9/05 – present
GPA 4.0/4.0

University of Tennessee - Knoxville

- M.S., Computer Science 12/04
GPA 4.0/4.0, Thesis: *A Framework for Downloading Wide-Area Files*
- B.S., Computer Science, Minor Mathematics 5/03
GPA 3.95/4.0, Summa Cum Laude

RESEARCH EXPERIENCE

Research Assistant, System-Level Design Group, Columbia University 9/05 – present

- Evaluating trade-offs between data mapping and concurrency for recursive parallel programs
- Developing load balancing techniques for stream programming with the Gedae programming tool
- Examined how topology influences throughput performance in latency-insensitive systems
- Formally verified two implementations of the latency-insensitive design library

Intern, IBM T.J.Watson Research Center, IBM Corporation Summer 2007

- Conducted study of the trade-offs of high-level programming tools on streaming multi-core systems
- Evaluated the Cell BE processor vs. the NVIDIA GeForce 8800 GPU for general purpose programs
- Implemented parallel benchmarks Bitonic Sort, Binomial Options Pricing, and Smith-Waterman alignment with the RapidMind programming tool

Research Assistant, Network Computing Lab, Columbia University 9/05 – 8/06

- Augmented a Linux sound device driver to enable audio capture in the THINC thin-client system
- Evaluated VoIP performance of the thin client on a PDA

Research Assistant, Logistical Computing and Internetworking Lab, University of Tennessee 1/04 – 7/05;

- Participated in a study of small optimal parity-check erasure codes 8/02 – 5/03
- Empirically analyzed algorithms for downloading distributed wide-area files
- Built a content-addressable server that uses MD5 hashes as an extension to the Internet Backplane Protocol

HONORS

- NDSEG Fellowship, 2005 Recipient, 3 year Graduate Fellowship
- National Merit Scholarship, University of Tennessee

SELECTED PUBLICATIONS

- R. L. Collins and L. P. Carloni, "Topology-Based Performance Analysis and Optimization of Latency-Insensitive Systems", *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems* (to appear).
- R. L. Collins and L. P. Carloni, "Topology-Based Optimization of Maximal Sustainable Throughput in a Latency-Insensitive System", *Design Automation Conference (DAC)*, June 2007.
- C. Li, R.L.Collins, S. Sonalkar, L.P.Carloni, "Design, Implementation, and Validation of a New Class of Interface Circuits for Latency-Insensitive Design", *International Conference on Formal Methods and Models for Codesign (MEMOCODE)*, May 2007.
- R. L. Collins and J. S. Plank, "Assessing the Performance of Erasure Codes in the Wide-Area," *The International Conference on Dependable Systems and Networks (DSN)*, June 2005.
- R. L. Collins and J. S. Plank, "Downloading Replicated, Wide-Area Files – a Framework and Empirical Evaluation," *The 3rd IEEE International Symposium on Network Computing and Applications (NCA)*, August 2004.