

Joseph A. Turner Jr.

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PROFILE

A successful PhD student at Virginia Tech, with extensive experience designing, prototyping, and developing complex scientific and systems-oriented software. Conducted research in computer systems with a focus in middleware since 2004. Specializes in systems software implementing advanced mathematics and statistics.

EDUCATION

VIRGINIA TECH, Blacksburg, VA

Cunningham Fellow (Doctorate of Philosophy) in Computer Science 2007 – Present

- Research member of the SCAPE Laboratory
- Focus on systems and middleware, especially performance analysis and power-aware computing
- Currently working on a project to automate the creation of analytical performance models of massively parallel scientific applications

UNIVERSITY OF SOUTH CAROLINA, Columbia, SC 2002 – 2006

Bachelor of Science in Computer Science

Magna Cum Laude with Honors from the SC Honors College

- Minor in Mathematics (all major coursework completed)
- Senior design project: “Blazing Carnage”, a real-time 3-dimensional car simulation. Roughly 6000 lines of hand-optimized simulation, artificial intelligence, and graphics code.

EXPERIENCE

RESEARCH ASSISTANT 2004 – Present

SCAPE Laboratory

(University of South Carolina then Virginia Tech)

- Design, prototype, and implement novel software systems with a focus on middleware and power- and thermal-aware systems
- Administer distributed and shared memory HPC systems
- Administer high-end networking subsystems

AWARDS

Cunningham Fellowship (top school fellowship at Virginia Tech) 2007 – Present

Carolina Scholar (top merit-based scholarship at University of South Carolina) 2002 – 2006

Palmetto Fellow (top merit-based South Carolina state scholarship) 2002 – 2006

Phi Beta Kappa 2006

TECHNICAL SKILLS

Languages: C, C++, Fortran, Java, PHP, Perl, shell scripting, HTML, JavaScript.

Operating systems: Linux (RHEL, Fedora, Ubuntu, Slackware), Solaris, Windows XP, Windows Vista.

Middleware and libraries: MPI, OpenMP, PBS, BLAS, Pthreads, Boost, OpenGL, CPPUnit, SQLite, PAPI.

Applications: Subversion, GCC toolchain, Bash, Quadrics networking appliances, Apache, MySQL.

Areas of Expertise: Agile development, test-driven development, power-aware computing, performance analysis, data mining, scientific computing, parallel computing, combinatorics, statistics.

PAPERS

- M. Tolentino, J. Turner, and K.W. Cameron, Memory-MISER: Improving Main Memory Energy Efficiency in Servers. IEEE Transactions on Computers, IEEE Press, 2008, in press.
- M. Tolentino, J. Turner, and K.W. Cameron, "Memory-MISER: A performance-constrained runtime system for power-scalable clusters", Proceedings of ACM International Conference on Computing Frontiers, May 2007.
- M. Tolentino, J. Turner, and K.W. Cameron, "An Implementation of Page Allocation Shaping for Energy Efficiency," Proceedings of the 3rd Workshop on High-performance, Power-aware Computing (HPPAC) 2007.

SELECTED PROJECTS

- **MemoryMiser:** Research system for conserving energy in the memory subsystem of server-class systems. Developed the control-theoretic control system for dynamically onlining and offlining memory modules.
- **PC-MPI:** Implemented a system utilizing the profiling layer in MPICH to gather performance counter information both inside of and outside of MPI calls in parallel applications.
- **GlobalPAPI:** Extended the Performance Application Programming Interface (PAPI) to monitor processor counter events at the global (system wide) level. This interface was then used to parameterize power and performance models.
- **NetworkPAPI:** Extended the Performance Application Programming Interface (PAPI) to monitor events on the Quadrics networking cards. This interface was then used to parameterize application-level models of communication.
- **MOGraph:** A 3D graph visualization suite utilizing OpenGL with a focus on real-time graph drawing of graphs with thousands of nodes.
- **Blazing Carnage:** A 3D computer game written in hand-optimized C/C++ with complex physical modeling, advanced artificial intelligence, and real-time fast paced graphics.

COMMUNITY INVOLVEMENT

Student Volunteer at Supercomputing 2005 and Supercomputing 2007.

Session Chair at ICPP 2007.

Reviewed papers for SC 2007.