

Glenn Elliott

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I am a researcher in the field of real-time systems, with an emphasis on developing practical solutions based upon sound real-time theory. My specific aims are to incorporate GPGPU into real-time systems. Prior to this, my interests were in computer graphics—a field that I draw upon for much of my real-time work.

Education

2008 – present

Doctoral Candidate in Computer Science

University of North Carolina, Chapel Hill, NC
Research in real-time operating systems utilizing GPUs.

2004 – 2006

Master's of Science in Computer Science

University of Southern California, Los Angeles, CA

2000 – 2003

Bachelor's of Science in Computer Science and Engineering, *cum laude*

Minor awarded in Multimedia and Creative Technologies
University of Southern California, Los Angeles, CA

Technical Experience

2009 – present

Research Assistant, UNC Real-Time Systems Group

Researcher in real-time operating systems (RTOSs). Specific aims towards the incorporation of GPUs in RTOSs to enable real-time GPGPU applications such as automated vehicles, augmented reality, broadcasting, and financial trading, to name a few. Most implementation is done within the context of the Linux kernel; developer for LITMUS^{RT}, UNC's Linux-based real-time operating system.

Summers

2014, 2013, 2012, 2011

Intern, NVIDIA

2014 (current): NVIDIA Mobile Vision. Applied techniques developed in my PhD research to improve the real-time properties of NVIDIA's "VisionWorks" computer vision toolkit.

2013: NVIDIA Research. Developed runtime environment to unify program code across multiple CPUs and multiple GPUs for enhanced multi-GPU programmability and tightly-coupled CPU/GPU software architectures.

2012: NVIDIA Mobile Vision. Investigated improvements in responsiveness of computer vision applications through scheduling techniques. Implementation in C/C++/Java implementation in the Android environment.

2011: NVIDIA CUDA Driver. Research and proof-of-concept implementations of potential features of future CUDA products. Implementation was in C++, assembly, and machine code.

2003 – 2008

Software Architect, Northrop Grumman

Software architect for the JCR Vehicle system, a tactical networked mobile platform used for geo-location, messaging, and other situational awareness operations in the battlefield environment. Program-level advisory and supervisory role in design of new software components to ensure compliance with guiding software architecture specifications.

Notable Accomplishments

- Architecture improvements. 10x performance increase from re-architecture of critical message passing stack.
- Network design. Designed and implemented protocols for unreliable mobile mesh networks.
- Security specialist. Ensured compliance with NSA security requirements. Design of system architecture changes needed to support mandatory access control (MAC) and multilevel secure (MLS) systems.

Technical Skills

OS Development

Linux kernel development: emphasis on schedulers, locking protocols, and device drivers.

Programming Languages

C/C++ and object oriented design patterns. Experience with SQL. Experience with Java. Experience with many scripting languages, including Python.

Development Platforms

UNIX/Linux (vi, gcc/gdb, make, shell, git, ClearCase, Perforce), Visual Studio, XCode.

Parallel Programming

Multithreaded/distributed computing: CUDA, pthreads, OpenMP, and MPI.

Multimedia and Game Related

OpenCV; OpenMAX; OpenGL, DirectX; Compression Theory; Networking; Artificial Intelligence.

Electrical Engineering

Digital Signal Processing; Microprocessor Design.

Relevant Areas of Study

Real-Time Systems; Cyber-Physical Systems; Operating System Design; Parallel Programming; Numerical Linear Algebra; Crowd Simulation; Computer Graphics.

Honors

2013

NVIDIA Fellowship, honorable mention

2008

Employee of the Quarter Nominee, Northrop Grumman Mission Systems: Tactical Systems Division