Multicore Programming

Why do I have a quad-core CPU running at 3 GHz instead of a 12 GHz processor? What is the difference between multicore and many-core? SMP sounds familiar but what are SMT and CMP? Who is Amdahl?

According to the hype, single CPU systems are history and multicore systems are the future. The evolution of CPUs from single to multicore implementations will add a whole new level of complexity to software development. Designers of applications targeting multicore CPUs will be faced with the challenge of utilizing multiple cores to avoid leaving performance on the table. Maintainers of legacy applications will be faced with the challenge of getting single-threaded applications to run efficiently on multiple cores.

In this talk we will investigate the origin of multicore CPUs and survey the current generation of multicore and many-core architectures. Then we will explore the principles of parallel programming and discuss how they apply to multicore CPUs. Finally, we will speculate on the future of multicore programming.

Bio:

Michael Pepe received his bachelor’s and master’s degrees in Computer Science from the University of Massachusetts Lowell. He is currently pursuing a master’s degree in Computer Engineering. Michael is a software engineer with over 10 years experience in the design and implementation of high performance algorithm libraries, middleware for distributed memory systems, frameworks for multicore processors, and component oriented programming. Michael is employed as a principal software engineer with Mercury Computer Systems, Inc. in Chelmsford, Massachusetts. He may be contacted at mpepe@cs.uml.edu.