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Data Science Seminar Series

Software Performance after Moore's Law

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Today, most application developers write code without much regard for how quickly it will run. Moreover, once the code is written, it is rare for it to be performance-engineered to run faster. That will change with the end of Moore's Law, the 50-year technology trend which has, until recently, relentlessly doubled the number of transistors on a semiconductor chip every two years. With the attenuation of this major source of computing performance, application programmers will increasingly find themselves turning to software performance engineering in order to develop innovative products and applications. Computer science faces a major challenge to devise software-productivity tools to make the development of fast software easy.

Charles E. Leiserson received his B.S. from Yale University in 1975 and his Ph.D. from Carnegie Mellon University in 1981. He joined the faculty of the Massachusetts Institute of Technology in 1981, where he is now the Edwin Sibley Webster Professor in MIT's Electrical Engineering and Computer Science (EECS) Department and leads the Supertech research group. He served as Associate Director and Chief Operating Officer of the MIT Computer Science and Artificial Intelligence Laboratory (CSAIL), the largest on-campus laboratory at MIT. He is a Margaret MacVicar Faculty Fellow, the highest recognition at MIT for undergraduate teaching. He is a Fellow of four professional societies — AAAS, ACM, IEEE, and SIAM — and he is a member of the National Academy of Engineering. He has received many Best Paper awards at prestigious conferences, as well as major awards, including the ACM-IEEE Computer Society Ken Kennedy Award, the IEEE Computer Society Taylor L. Booth Education Award, ACM Paris Kanellakis Theory and Practice Award, and the ACM and Hertz Foundation Doctoral Dissertation Awards.

Professor Leiserson's current research centers on software performance engineering: making computer programs run fast by whatever means: algorithms, parallel computing, caching, compilation, processor pipelining, bit tricks, vectorization, etc. His contributions include the Cilk parallel-programming language and runtime system, which has been available in major compilers for over a decade.