ENGR 651/655 Seminar

F, 12:00 – 12:50, LIBR 36

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Propagation of Information in Parallel Computations and the Design of More Optimal Sequential Algorithms

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In this presentation, we examine the nature of a classic Monte Carlo algorithm that exhibits a high degree of computational parallelism. The relationship between parallelism and the Monte Carlo solution technique of "scoring" boundary information is shown to enhance parallelism but at the expense of degrading solution accuracy and distorting optimal solution time. The Monte Carlo scheme is applied to the solution of Poisson's equation. The analysis of the associated computational parallelism leads to a novel *sequential* Monte Carlo solution scheme that introduces a unique iterative, boundary propagation method that incorporates successive-under-relaxation (SUR). Analogously, it is demonstrated that the convergence of the SUR approach is accelerated by incrementally (per iteration) reducing the scale of the under-relaxation parameter In this presentation, the notion of iterative schemes are also examined and their relevance in the design of the presented method.