1068-49-243 **Cosmin G Petra*** (petra@mcs.anl.gov) and **Mihai Anitescu**. *Scalable Stochastic Programming via Interior-point Methods.*

We present our recent efforts in solving large scale stochastic programming problems on massively parallel machines. The solution of sample average approximation problems is obtained using an interior-point framework in which the scenarios are decomposed using a Schur-complement technique and distributed across nodes. We introduce a stochastic preconditioner for the Schur complement that removes the expensive factorization of the dense Schur complement from the parallel execution flow. A considerable increase in scalability is obtained for a wide range of cores. We also present the spectral analysis of the preconditioned matrix which indicates an exponential clustering of the eigenvalues of the preconditioned matrix around 1.

The preconditioning technique however suffers from a memory bottleneck as does the classical Schur-complement. In the second part of the talk we present a novel approach for solving the dense Schur-complement systems in a distributed memory environment. This approach not only removes the memory bottleneck but also improves the scalability. Over 90% strong scaling efficiency was obtained for large scale stochastic unit commitment problems on up to 2048 cores. (Received January 19, 2011)