LSM Seminar

Wednesday, April 6, 2022, 11:00-12:00
Auditorium WHGA/001

Large scale linear algebra through randomization and communication avoiding techniques

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In this talk we will review recent advances in the design of high performance linear algebra algorithms that aim at minimizing data transfer while also ensuring robustness. They are thus efficient on current and emerging architectures where the communication cost dominates the cost of performing floating point operations. We will focus in particular on solving linear systems of equations and we outline the usage of randomization techniques and mixed precision in this context. We wil also describe a multilevel domain decomposition method that is robust and highly scalable. It allows to bound the condition number of the preconditioned matrix and it is based on a hierarchy of robust coarse spaces that are able to transfer spectral information from one level to the next. The numerical and parallel performance of these algorithms and their impact on several applications is further discussed.

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