

qr_mumps: a runtime-based Sequential Task Flow parallel solver

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Abstract

qr_mumps is a parallel, direct solver for sparse linear systems based on the multifrontal QR factorization. Parallelism is achieved using a Sequential Task Flow (STF) programming model on top of the StarPU runtime system. In this talk we will show how STF parallelism can be applied to a sparse, direct solver and how the use of a modern runtime system allows for the portable and efficient implementation of complex algorithms that can improve its performance and scalability as well as its memory consumption. The effectiveness of this approach will be assessed through experimental results on multicore, manycore (Intel Knights Landing) and hybrid (multicore+GPU) platforms.