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Large-Scale Iterative Image Deblurring in Java

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Image deblurring, or deconvolution, is the process of using computational methods to reconstruct an image that has been degraded by blurring and noise. I will describe *Parallel Iterative Deconvolution* Java software for image deblurring. It is a fully multithreaded implementation of three iterative methods: Modified Residual Norm Steepest Descent (MRNSD), Conjugate Gradient for Least Squares (CGLS) and Hybrid Bidiagonalization Regularization (HyBR). Two key components of the software are *JTransforms* - the first, open source, multithreaded FFT library written in Java, and *Parallel Colt* - a multithreaded version of a Java library for high performance scientific computing. Benchmarks show that Parallel Iterative Deconvolution is highly scalable and efficient on SMP machines. Image deblurring examples, including performance comparisons with other existing software, will also be given.