IPSC Project Report

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The development of the fast Fourier transform (FFT) and its numerous variants in the past 30 years has led to very efficient software and hardware implementations of the transform on uniprocessor computers. In recent years, many researchers have recognized the practical importance of minimizing computing time by parallelizing sequential FFT algorithms in various ways for today's high-performance multiprocessor computers. This paper presents many FFT variants already proposed by others in a common framework, which illuminates the progress made in parallelizing them to this date. In addition, three new parallel FFT algorithms along with communication complexity results are presented. The proposed algorithms show alternative ways of designing parallel FFT algorithms which feature reduced communication cost and further flexibility in the choices of data mappings.