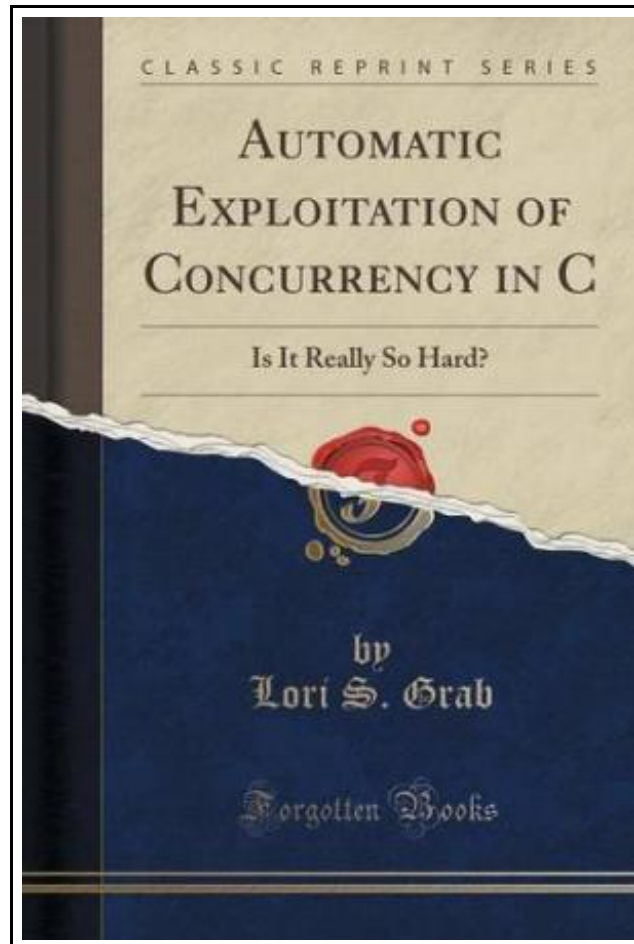


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(Janie Wilkinson)

AUTOMATIC EXPLOITATION OF CONCURRENCY IN C: IS IT REALLY SO HARD? (CLASSIC REPRINT) (PAPERBACK)



Forgotten Books, United States, 2015. Paperback. Book Condition: New. 229 x 152 mm. Language: English . Brand New Book ***** Print on Demand *****.Excerpt from Automatic Exploitation of Concurrency in C: Is It Really So Hard? The vast majority of work being done today on the automatic exploitation of concurrency, for both multiprocessors and vector machines, is not being done for C. Yet there are many important applications, written in C, which would benefit immensely from the speedup produced by such techniques. Many more applications would be written in C were there optimizing, vectorizing and parallelizing compilers for the language. In this paper we consider whether it is possible to have compilers that will automatically exploit concurrency in C. We discuss the relationship between automatic exploitation of concurrency for the purposes of vectorizing and multiprocessing. We review the basic techniques and transformations used and examine the necessary conditions to perform these transformations, with examples in C. Several elements of the C language and programming style, such as pointers and recursion, make it difficult to do the necessary data flow analysis. There are two possible approaches to this problem: to bypass code or blocks of code that contain difficult features and be unable to apply optimizations to these fragments, or to suitably restrict the language. We examine the choices made by the few available vectorizing and parallelizing C compilers and consider what the future may hold in the light of current research. 1. Introduction The goal of automatic parallelization, whether for multiprocessors or for vector machines, is so take a program with serial semantics and have the compiler or preprocessor produce a parallel program. The programmer avoids having to deal with the difficulties of synchronization and other issues that arise in the writing and debugging of explicitly parallel programs (Grob and...



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