Mastering Parallel Programming With R

Computer Systems Organization -- Parallel architecture f82d0734a7

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It will teach you a variety of parallelization techniques, from simple use of R's built-in parallel package versions of lapply(), to high-level AWS cloud-based Hadoop and Apache Spark frameworks. What You Will Learn*Create and structure efficient load-balanced parallel computation in R, using R's built-in parallel package*Deploy and utilize cloud-based parallel infrastructure from R, including launching a distributed computation on Hadoop running on Amazon Web Services (AWS)*Get accustomed to parallel efficiency, and apply simple techniques to benchmark, measure speed and target improvement in your own code*Develop complex parallel processing algorithms with the standard Message Passing Interface (MPI) using RMPI, pbdMPI, and SPRINT

packages*Build and extend a parallel R package (SPRINT) with your own MPI-based routines*Implement accelerated numerical functions in R utilizing the vector processing capability of your Graphics Processing Unit (GPU) with OpenCL*Understand parallel programming pitfalls, such as deadlock and numerical instability, and the approaches to handle and avoid them*Build a task farm master-worker, spatial grid, and hybrid parallel R programsIn DetailR is one of the most popular programming languages used in data science. It will also teach you low level scalable parallel programming using RMPI and pbdMPI for message passing, applicable to clusters and supercomputers, and how to exploit thousand-fold simple processor GPUs through ROpenCL. Master the robust features of R parallel programming to accelerate your data science computationsAbout This Book*Create R programs that exploit the computational capability of your cloud platforms and computers to the fullest*Become an expert in writing the most efficient and highest performance

parallel algorithms in R*Get to grips with the concept of parallelism to accelerate your existing R programsWho This Book Is ForThis book is for R programmers who want to step beyond its inherent single-threaded and restricted memory limitations and learn how to implement highly accelerated and scalable algorithms that are a necessity for the performant processing of Big Data. No previous knowledge of parallelism is required. By the end of the book, you will understand the factors that influence parallel efficiency, including assessing code performance and implementing load balancing; pitfalls to avoid, including deadlock and numerical instability issues; how to structure your code and data for the most appropriate type of parallelism for your problem domain; and how to extract the maximum performance from your R code running on a variety of computer systems. Mastering Parallel Programming with R presents a comprehensive and practical treatise on how to build highly scalable and efficient algorithms in R. Applying R to big data and complex analytic tasks

requires the harnessing of scalable compute resources. This book also provides for the more advanced technical programmer seeking to go beyond high level parallel frameworks f82d0734a7

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highest performance parallel algorithms in R [*]Get to grips with the concept of parallelism to accelerate your existing R programs Book DescriptionR is one of the most popular programming languages used in data science. What you will learn [*]Create and structure efficient load-balanced parallel computation in R, using R's built-in parallel package [*]Deploy and utilize cloud-based parallel infrastructure from R, including launching a distributed computation on Hadoop running on Amazon Web Services (AWS) [*]Get accustomed to parallel efficiency, and apply simple techniques to benchmark, measure speed and target improvement in your own code [*]Develop complex parallel processing algorithms with the standard Message Passing Interface (MPI) using RMPI, pbdMPI, and SPRINT packages [*]Build and extend a parallel R package (SPRINT) with your own MPI-based routines [*]Implement accelerated numerical functions in R utilizing the vector processing capability of your Graphics Processing Unit (GPU) with OpenCL [*]Understand parallel

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