Introduction to HPC with MPI for Data Science (Undergraduate Topics in Computer Science)

Frank Nielsen

Introduction to HPC with MPI for Data Science (Undergraduate Topics in Computer Science)

Frank Nielsen

Introduction to HPC with MPI for Data Science (Undergraduate Topics in Computer Science) Frank Nielsen

This gentle introduction to High Performance Computing (HPC) for Data Science using the Message Passing Interface (MPI) standard has been designed as a first course for undergraduates on parallel programming on distributed memory models, and requires only basic programming notions.

Divided into two parts the first part covers high performance computing using C++ with the Message Passing Interface (MPI) standard followed by a second part providing high-performance data analytics on computer clusters.

In the first part, the fundamental notions of blocking versus non-blocking point-to-point communications, global communications (like broadcast or scatter) and collaborative computations (reduce), with Amdalh and Gustafson speed-up laws are described before addressing parallel sorting and parallel linear algebra on computer clusters. The common ring, torus and hypercube topologies of clusters are then explained and global communication procedures on these topologies are studied. This first part closes with the MapReduce (MR) model of computation well-suited to processing big data using the MPI framework.

In the second part, the book focuses on high-performance data analytics. Flat and hierarchical clustering algorithms are introduced for data exploration along with how to program these algorithms on computer clusters, followed by machine learning classification, and an introduction to graph analytics. This part closes with a concise introduction to data core-sets that let big data problems be amenable to tiny data problems.

Exercises are included at the end of each chapter in order for students to practice the concepts learned, and a final section contains an overall exam which allows them to evaluate how well they have assimilated the material covered in the book.

From reader reviews:

Peggy Mitchum:

What do you think about book? It is just for students as they are still students or the idea for all people in the world, what the best subject for that? Just you can be answered for that issue above. Every person has several personality and hobby for every other. Don't to be pressured someone or something that they don't want do that. You must know how great in addition to important the book Introduction to HPC with MPI for Data Science (Undergraduate Topics in Computer Science). All type of book is it possible to see on many resources. You can look for the internet solutions or other social media.

Denise Rutledge:

Now a day individuals who Living in the era where everything reachable by connect to the internet and the resources within it can be true or not need people to be aware of each details they get. How a lot more to be smart in having any information nowadays? Of course the answer then is reading a book. Examining a book can help folks out of this uncertainty Information mainly this Introduction to HPC with MPI for Data Science (Undergraduate Topics in Computer Science) book because book offers you rich information and knowledge. Of course the knowledge in this book hundred percent guarantees there is no doubt in it as you know.

Richard Vaccaro:

People live in this new day time of lifestyle always attempt to and must have the free time or they will get lots of stress from both everyday life and work. So , if we ask do people have extra time, we will say absolutely sure. People is human not just a robot. Then we ask again, what kind of activity are there when the spare time coming to anyone of course your answer will certainly unlimited right. Then do you ever try this one, reading textbooks. It can be your alternative with spending your spare time, often the book you have read is actually Introduction to HPC with MPI for Data Science (Undergraduate Topics in Computer Science).

Donna Dalessio:

Is it you actually who having spare time then spend it whole day simply by watching television programs or just lying on the bed? Do you need something totally new? This Introduction to HPC with MPI for Data Science (Undergraduate Topics in Computer Science) can be the solution, oh how comes? A book you know. You are therefore out of date, spending your extra time by reading in this brand-new era is common not a nerd activity. So what these publications have than the others?

Download and Read Online Introduction to HPC with MPI for Data Science (Undergraduate Topics in Computer Science) Frank Nielsen #2QWKUTGJMVZ

Read Introduction to HPC with MPI for Data Science (Undergraduate Topics in Computer Science) by Frank Nielsen for online ebook

Introduction to HPC with MPI for Data Science (Undergraduate Topics in Computer Science) by Frank Nielsen Free PDF d0wnl0ad, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read Introduction to HPC with MPI for Data Science (Undergraduate Topics in Computer Science) by Frank Nielsen books to read online.

Online Introduction to HPC with MPI for Data Science (Undergraduate Topics in Computer Science) by Frank Nielsen ebook PDF download

Introduction to HPC with MPI for Data Science (Undergraduate Topics in Computer Science) by Frank Nielsen Doc

Introduction to HPC with MPI for Data Science (Undergraduate Topics in Computer Science) by Frank Nielsen Mobipocket

Introduction to HPC with MPI for Data Science (Undergraduate Topics in Computer Science) by Frank Nielsen EPub