

CRPC Parallel Computing Handbook: Outline

I. Parallelism

1. *Introduction* — Jack Dongarra, Ken Kennedy, Andy White
[Editor: Geoffrey Fox]
(draft on Web site – 13 pages)
(missing bibliographic information)
2. *Parallel Computer Architectures* —
William Gropp, Rick Stevens, and Charlie Catlett
[Editor: Ian Foster]
(final version on Web site – 26 pages)
3. *Parallel Programming Considerations* — Ken Kennedy,
Jack Dongarra, Ian Foster, Dan Reed, Andy White
[Editor: Geoffrey Fox]
(draft on Web site – 27 pages)

II. Applications

4. *General Application Issues* — Geoffrey Fox
[Editor: Andy White]
(draft on Web site – 16 pages)
5. *Poisson Problem* — William Gropp
[Editor: Geoffrey Fox]
(final version on Web site – 11 pages)
6. *Parallel Computing in CFD* —
Ron Henderson, Dan Meiron, Manish Parashar, Ravi Samtaney
[Editor: Geoffrey Fox]
(draft on Web site – 53 pages)
7. *Parallel Computing in Environment and Energy* — Mary F. Wheeler,
Wonsuck Lee, Clint N. Dawson, Dorian C. Arnold, Tahsin Kurc,
Manish Parashar, Joel Saltz, Alan Sussman
[Editor: Geoffrey Fox]
(draft on Web site – 21 pages)
8. *Parallel Computational Chemistry: An Overview of NWChem* —
David E. Bernholdt
[Editor: Geoffrey Fox]
(draft on Web site – 19 pages)
9. *List of Application Overviews* — Geoffrey Fox
[Editor: Andy White]
(incomplete — some overviews w/ bibliographic info available from Web site)

III. Software Technologies

10. *Software Technologies* — Ian Foster, Jack Dongarra, Ken Kennedy
[Editor: Andy White]
(draft on Web site – 22 pages)
(missing bibliographic information)
11. *Message Passing and Threads* — Ian Foster, William Gropp, Carl Kesselman
[Editor: Ken Kennedy]
(draft on Web site – 17 pages)
(missing bibliographic information)
12. *Parallel I/O* — Rajeev Thakur, William Gropp
[Editor: Ian Foster]
(final version on Web site – 30 pages)
13. *Languages and Compilers* — Ken Kennedy, Chuck Koelbel
[Editor: Ian Foster]
(draft on Web site – 19 pages)
14. *Parallel Object-Oriented Libraries* —
Dennis Gannon, John Reynders, Mani Chandy
[Editor: Ken Kennedy]
(draft on Web site – 25 pages)
15. *Problem Solving Environments* — Geoffrey Fox, Jack Dongarra
[Editor: Ken Kennedy]
(draft on Web site – 32 pages)
16. *Software Tools* — Dan A. Reed, Ruth A. Aydt
[Editor: Ken Kennedy]
(final version on Web site – 25 pages)

IV. Enabling Technologies and Algorithms

17. *Title Unknown* — Jack Dongarra, Ken Kennedy
(draft not yet available — target date: unknown)
18. *Graph Partitioning for High-Performance Scientific Simulations* —
Kirk Schloegel, George Karypis, Vipin Kumar
[Editor: Ian Foster]
(final version on Web site – 48 pages)
19. *Mesh Generation* — Joe Thompson, Bharat Soni
[Editor: Ken Kennedy]
(draft on Web site – 31 pages)
20. *Templates and Numerical Linear Algebra* —
Jack Dongarra, Victor Eijkhout, Dan Sorensen
[Editor: Geoffrey Fox]
(final version on Web site – 46 pages)

21. **Software for the Scalable Solution of PDEs** —
Satish Balay, William D. Gropp, Lois Curfman McInnes, Barry F. Smith
[Editor: Jack Dongarra]
(final version on Web site – 27 pages)
22. **Parallel Continuous Optimization** — John E. Dennis, Jr., Zhijun Wu
[Editor: Jack Dongarra]
(draft on Web site – 22 pages)
23. **Path Following in Scientific Computing and its Implementation in AUTO** —
Herb B. Keller, Eusebius J. Doedel
[Editor: Jack Dongarra]
(final version on Web site – 31 pages)
24. **Automatic Differentiation** — Alan Carle
[Editor: Jack Dongarra]
(final version on Web site – 19 pages)

V. Conclusion

25. **Wrap-up and Futures** — Andy White
[Editor: Jack Dongarra]
(draft not yet available — target date: unknown)