David Bryan Carpenter

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Education

Ph D. in Physics, University of London (1979-1983).
B.S. in Physics, University of London (1976-1979).

Professional Experience

1996–present Research Scientist, NPAC, Syracuse University **1994–1995** Programmer, High Performance Computing Centre, Southampton, UK. **1989–93** Research Fellow in Department of Electronics and Computer Science and Department of Physics, Southampton, UK. **1989** Employed at "Transputer Technology Solutions", Southampton, UK. **1985–1988** Research Fellow in Department of Physics, Southampton, UK. **1985** Royal Society Overseas Fellowship at DESY, Hamburg. **1983–1984** Research Fellow in Theoretical Physics Department, Edinburgh University.

Select Publications:

[1] B. Carpenter, V. Getov, G. Judd, T. Skjellum and G. Fox, "MPI for Java—Position Document and Draft API Specification." Java Grande Forum Technical Report JGF-TR-03. November 1998.

[2] B. Carpenter, G. Fox, S. H. Ko and S. Lim, "Object Serialization for Marshalling Data in a Java Interface to MPI", ACM 1999 Java Grande Conference, ACM Press, 1999.

[3] G. Zhang, B. Carpenter, G. Fox, X. Li, and Y. Wen. "The HPspmd model and its Java Binding", in Rajkumar Buyya, editor, *High Performance Cluster Computing*, Vol 2, Prentice Hall, 1999.

[4] B. Carpenter, G. Fox, D. Leskiw, X. Li, Y. Wen and G. Zhang "Language Bindings for a Data-parallel Runtime", 3rd Int'l Workshop on High-Level Parallel Programming Models and Supportive Environments, IEEE Computer Society Press, 1998.

[5] B. Carpenter, G. Zhang and Y. Wen "NPAC PCRC Runtime Kernel Definition", Center for Research on Parallel Computation, CRPC-TR97726, 1997.

[6] G. Zhang, B. Carpenter, G. Fox, X. Li, X. Li and Y. Wen "PCRC-based HPF Compilation", Lecture Notes in Computer Science, Vol 1366 (1997), Springer.

[7] B. Carpenter, Y.-J. Chang, G. Fox, D. Leskiw and X. Li, "Experiments with 'HPJava' ", Concurrency: Practice and Experience, Vol 9, num 9 (1997), p633.

[8] J. Merlin, B. Carpenter and Tony Hey, "shpf: a Subset High Performance Fortran compilation system", Fortran Journal, (1996), pp 2-6.

[9] D.B. Carpenter and H. Glaser, "Some Lattice-Based Scientific Problems, expressed in Haskell", Journal of Functional Programming, 6(3):419-443, May 1996.

[10] As. Abada, C.R. Allton, Ph. Boucard, D.B. Carpenter, M. Crisafulli, S. Güsken, P. Hernadez, V. Lubicz, G. Martinelli, O. Pène, C.T. Sachrajda, K. Schilling, G. Siegert and R. Sommer, "Semi-leptonic Decays of Heavy Flavours on a Fine-grained Lattice" Nucl.Phys. B416 (1994) p675.

Biographical sketch:

Working with Tony Hey at the University of Southampton, Carpenter was one of the earliest users of Inmos transputer-based systems, applying them in parallel simulation of physical systems. He subsequently became involved with design of libraries to support parallel computing. In a fruitful collaboration with John Merlin, he was codeveloper of the *shpf* system, an early implementation of subset HPF. This work involved an initial implementation of the Adlib runtime library.

Moving to Syracuse in 1996, Carpenter worked in the Parallel Compiler Runtime Consortium project (PCRC). As part of this work the Adlib library was reengineered to meet the needs of a new HPF compiler, and delivered as the "NPAC PCRC runtime kernel". PCRC work on C++ interfaces to Adlib influenced current work at NPAC in the *HPJava* and *HPspmd* projects.

In the latter stages of the PCRC project, Carpenter was responsible for running the PCRC group at NPAC, and redirected activities towards exploitation of Java for High Performance computing. These activities continue with support from a new NSF grant. As part of the Java Grande process, Carpenter is involved with a working group developing a common, MPI-like, message-passing API for Java.

Fields of experience include parallel computing, computational science, parallel languages, parallel compilers and library support, runtime libraries for distributed arrays, message passing libraries, object-oriented programming, scientific programming, functional programming and logic programming, formal methods, UNIX system programming, and theoretical physics.

Ph.D. Advisor

Elliot Leader