



KCI
PO Box 1641
Litchfield Park, AZ 85340
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KCI Consultant Career Summary

I have more than twenty years of experience in scientific computation in both academic settings and industry. Previously, I was a researcher at the University of Texas at Austin in the Engineering Mechanics Dept for 19 years. I am currently a full-time consultant. My work has been in the area of Fluid Flow and Transport Problems using Finite Elements on Parallel Computers. I have documented this work in 30+ publications, proceedings, reports and presentations. As chief designer, I developed 3D Finite Element Incompressible Fluid Flow with Transport code for a NASA Grand Challenge project for large parallel computers such as the T3E. I have worked on C/C++ projects and Build & Regression Testing Systems. I am currently working on a project supporting Flexible Coupling of Different Physics Modules and Subcycling, as well as developing Overset Grids in the Sierra Framework.

Work Experience

Present: Consultant

- _ Designing and building the *engine* used by SNTTOOLS project
- _ Developed the `runtest` command used daily by Sierra/Nevada developers to run regression tests.
- _ Created *Solver Control* with allows flexible time stepping and control coupling between multiple physics modules.
- _ Started work on adding Overset Grid capabilities to the Sierra Framework. Exxon Mobil and Instrumental:
- _ Developed C/C++ libraries, build and regression testing systems.
- _ Benchmarking and Performance Modeling.

Researcher at U.T. Austin Engineering Mechanics Dept

- _ Many Projects: NASA Grand Challenge (Chief Designer) MGFLO achieved 140 GFlops on 1280 processor T3E, Built first Beowulf Linux cluster at U.T. Served on 3 dissertations committees, Guided several Masters and PhD students. Chief System Administer for the CFD Labs collection of UNIX workstations.
- _ Research work in Finite Elements and Fluid Flow with transport with surface tension driven flow.
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- _ Research work in solving large matrices that come from Fluid Flow on large distributed memory parallel computers. This includes work on Iterative methods and preconditioners.
- _ Developed Build and Regression testing systems.
- _ Work on Adaptive Refinement for use in Finite Element codes.



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– *Dial-an-operator* system for Finite Element Codes.

Knowledge & Skills:

Object Oriented Design and Programming, C++, Python, Perl, Unix and Linux Programming and System Administration. Designing and Building Flexible systems for numerical codes. Experience with Finite Elements and Finite Difference Numerical Methods.

Education:

University of Texas at Austin

Ph.D. Engineering Mechanics, 8/1988

Advisor: Graham F. Carey

Dissertation Title: “Finite Element Simulation of Coupled Fluid Flow, Heat Transfer and Magnetics Fields with Applications to Welding”

M.I.T

S.B. S.M. Electrical Engineering 8/1980

Relevant Publications:

- Simulation of Viscous Flow with Reactive Species Transport on Large Scale Parallel Supercomputers, High Performance Computing '00 Proceeding, 2000, Washington DC. (with Spencer Swift and G. F. Carey).
- Parallel Finite Element Solution of 3D Rayleigh-Benard-Marangoni Flows, IJNMF, 1999 (with G. F. Carey, G. Bicken and W. Barth)
- Maximizing Sparse Matrix-Vector Product Performance on RISC based MIMD Computers, JPDC, 37, 2, Sept. 15, 1996, (with Spencer Swift and G. F. Carey).
- Finite Element Analysis of Anisotropic Fluid Suspensions, IJNMF, 22, 11-27, 1996, (with G. F. Carey and T. D. Hu).
- Finite Element Modelling of In Situ Vitrification, In Situ Journal, Vol 17, No. 2, 1993, (with G. F. Carey, and R. MacKinnon).
- Automatic Remeshing Scheme for Modeling Hot Forming Process, J. Fluid Engr., 108, 465-469, 1986, (with H. P. Wang).
- Coupled Heat Transfer and Viscous Flow and Magnetic Effects in Weld Pool Analysis, IJNMF, 9, 713-730, 1989, (with G. F. Carey)

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