

Chris Chartrand

Senior Member of the Technical Staff, Sandia National Laboratories

ACADEMIC/PROFESSIONAL QUALIFICATIONS SUMMARY

- Solid understanding of high and low speed Fluid Dynamics
- Proficient with numerical methods
- Proficient in Fortran, C/C++, and parallel (MPI and OpenMP) programming
- Proficient with Linux/Unix and Bash/C-shell scripting, Python
- Proficient in both structured and unstructured grid generation (Gridgen, Pointwise)
- Proficient with post-processing utilities (Enight, TecPlot, Grace, Paraview)

EDUCATION AND TRAINING

- 2005 M.S. Mechanical Engineering, University of Massachusetts
- 2001 B.S. Mathematics and Statistics, University of Massachusetts

RESEARCH AND PROFESSIONAL EXPERIENCE

Research Scientist, Combustion Research and Flow Technology, 2/2005 - 4/2012

- Develop, maintain and debug complex numerical codes with MPI functionality
- Perform and analyze complex transient LES simulations using high performance computing
- Construction of both structured and unstructured computational grids.
- Analysis and understanding of reacting plume and base flows
- Performed Aero-Acoustic analysis of high speed aircraft weapons bay cavities.
- Perform Direct Simulation Monte Carlo (DSMC) simulations of rarefied flows
- Perform Coupled DSMC/Navier-Stokes simulations by determining a continuum limit parameter and calculating a coupling boundary condition.
- Developed a statistical model for prediction of store drop trajectory envelopes by compiling a database of simulations and using artificial neural networks.

Scientific Developer/Analyst, Weidlinger Associates, 5/2012 - 1/2014

- Update and maintain scientific software
- Analysis of blast door failure due to explosive for DTRA programs
- Implement code coupling between finite element structural code and CFD fluid code
- Develop a complex geometry cell cutting algorithm for defining moving fluid-structure interaction (FSI) boundary conditions
- Implement KDtree search algorithms and OpenMP for code optimization
- Define benchmark tests, and perform numerical simulations to test coupled simulation result accuracy

Senior Member of the Technical Staff, Sandia National Laboratories, 1/2014 - Present

- Maintain and develop scientific software
- Run complex models and simulations including CFD and Solid Mechanics
- Simulation and analysis of water power devices.
- Perform and analyze complex transient LES simulations using high performance computing