



# Combustion

Science & Engineering, Inc.

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## **DARIN S. VIEHE**

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### **EDUCATION:**

B.S., Aeronautical Engineering, Purdue University Major: Aeronautical Engineering, Emphasis on Computational Fluid Dynamics and Numerical Methods. Minor: Structural Mechanics, Emphasis on Finite Element Matrix Methods. Aeronautical Engineering, Purdue University, August 1996.

### **PROFESSIONAL EXPERIENCE:**

#### **Senior Engineer, Combustion Science & Engineering, Inc., Feb. 2002 to present.**

Modeling and analysis of various gas turbine components utilizing StarCD as a CFD solver. Construction and manipulation of complex 2D and 3D meshes with the use of ANSA and PROSTAR. Creation of complex hybrid meshes utilizing Hexahedral, Tetrahedral, Prism and Pyramid elements. Developed software tools for the mapping of FDS solution results to StarCD for structural thermal analysis. Coordinate with clients and project engineers for project direction and associated CFD analyses. Prepare and/or deliver project reports, presentations and results to clients. Management of a medium sized Unix / Linux network, including clusters and multiprocessor machines. Creation of software tools for the management of databases and efficient use of computing resources. Design and implementation of network landscape and overall system configuration.

#### **FEA Engineer, Ford Motor Company, June 2001 – Jan. 2002.**

Construction and manipulation of complex 2D tire models utilizing Abaqus axisymmetric elements. Perform fatigue analysis, using Abaqus standard, of 3D tire models to obtain crack energy release rates for various loading conditions. Used Matlab to develop Ford internal GUI software for the visualization, manipulation and creation of Abaqus input decks, including job control and post processing. Models include rubber and reinforced rubber components utilizing user coded material models. Team won the Henry Ford Award for groundbreaking work in the area of tire failure analysis.

#### **FEA Engineer, Trelleborg Automotive, Jan. 2001 – June 2001.**

Plan and implement the finite element analysis strategy for use within the component design cycle. Coordinate with project and design engineers for the design refinement stages. Prepare and/or deliver project reports, presentations and results. Generate hexahedral and tetrahedral 3D solid element models with the use of Altair Hypermesh. Perform static and modal analyses of various prototype mount and bracket designs utilizing Abaqus. Components modeled include body brackets, roll restrictors, transmission mounts and engine mounts. Perform optimization analyses of transmission mounts using Altair Optistruct. Linear and non-linear isotropic material models used within the analyses, including both rubber and metal components.

**FEA/CFD Engineer, Optimal CAE, Inc. April 198 – Dec. 2000.**

Experienced in the generation and rebuilding of CAD data using ICEM DDN and ANSA. Extensive use of T-Grid, ANSA and ICEM Tetra for the generation of tetrahedral volume meshes. Complex volume hexahedral meshing experience utilizing ICEM Mulcad, ICEM Hexa and ANSA. Proficiency is using T-Grid for the generation of CFD zonal-hybrid meshes. Capable of using of Hypermesh and ANSA for the generation of solid and shell element meshes. Utilized Nastran for static, modal and frequency response analyses of various automotive components. Performed linear and non-linear static, modal and contact analyses with the use of Abaqus Standard. Performed Abaqus transient thermal analyses utilizing the steady-state CFD solution from Fluent. Steady-state analysis on various intake-manifold designs using StarCD. Transient analyses of the intake-manifold flow cycle using StarCD coupled with GT-Power. HVAC unit and duct specific analyses including in-cabin flow and de-icing simulations using Fluent. HVAC studies' comparing hexahedral, tetrahedral and zonal-hybrid meshes using Fluent as the solver. Performed Conjugate Heat Transfer analyses for multiple brake rotor designs using Fluent and Abaqus. Experienced using StarCD for Multiple Reference Frame and Transient Moving Mesh simulations.

**COMPUTER SKILLS and PROGRAMMING EXPERIENCE:**

Experienced on Macintosh, DOS, Windows9x / NT and UNIX workstations.

Experienced user of Microsoft Word, Excel and PowerPoint as well as Adobe Acrobat.

Ported StaDyn, a FORTRAN FEA code by Prof. James F. Doyle, Purdue University, to the Macintosh.

Course work creating a fluid element for use within StaDyn for the study of noise and vibration.

Fluent with the Matlab programming language, including GUI development.

Developed C/C++ data translation routines for use in conjugate heat transfer problems.

Developed C routines for the generation of energy-pulse boundary conditions for use within Fluent.

Proficient with Perl, Fortran, C/C++ , HTML and Java programming languages.

Implemented UNIX system administration (i.e., directory structure, backups, and licensing, etc.).

Analysis post-processing accomplished with the use of Fieldview, PROSTAR, Hypermesh and Matlab.