

EXPERIENCE

BRG MACHINERY CONSULTING, LLC, Charlottesville, VA

Machinery Specialist, November 2004 - Present

Work with a group of highly qualified machinery specialists in providing a full range of rotating machinery management services. Responsible for all types of finite element analyses, including foundation and pedestal dynamic analysis, electromagnetic analysis of motors and magnetic bearings, and thermal analysis.

ALLAIRE DEVELOPMENT COMPANY, Charlottesville, VA

Consultant, December 1995 – November 2004

Responsibilities included structural dynamic response and vibration analysis, magnetic bearing design and performance assessment. Major projects include the following:

- Performed dynamic response analysis of large motor/compressor train supported on reinforced concrete columns using finite elements. Found a cost efficient structural modification to mitigate large vibrations experienced by the machine.
- Developed preliminary active magnetic bearing design for a space satellite application as part of an effort to develop very low loss active magnetic bearings.
- Performed electromagnetic finite element analyses of multiple magnetic bearings, generators, and motors.

UNIVERSITY OF VIRGINIA, Charlottesville, VA

Research Assistant, September 1993 – August 2004

Primary area of study was the adaptation and application of finite element methods to a variety of engineering and biomechanical problems. Major projects included:

- Developed an anatomically accurate finite element model of the human cervical spine for evaluating spine surgery and fusion techniques.
- Developed a comprehensive finite element code for evaluating electromagnetic fields in magnetic bearings.
- Participated in the design of a magnetic ventricular assist device. Responsibilities included developing conceptual AutoCAD drawings and pump design.
- Performed modal and thermal analyses of a hot textile fiber roll as part of a design effort to replace a rolling element bearing with a magnetic bearing.
- Performed thermal deformation analysis of a gas pipeline compressor suspended in magnetic bearings.

Teaching Assistant, August 2001 – May 2002

Undergraduate Courses: Introduction to Engineering, Multivariable Calculus, Machine Design

LOS ALAMOS NATIONAL LABORATORY, Los Alamos, NM

Research Assistant, Summers 1991, 1992, 1993

Major projects included:

- Devised, analyzed, and compared several accelerator transmutation of iodine concepts as possible methods for treating radioactive iodine. Wrote an internal report for inclusion in a final conceptual design document.
- Performed analysis of the thermal time constant associated with the moderator material in the Russian TOPAZ-II space nuclear power system.
- Performed independent check of calculations prepared in developing a Transient Reactor Analysis Code input deck for the New Production, Heavy Water Reactor. Revised and simplified draft quality assurance procedure for conduct of safety analysis calculations.

EDUCATION

UNIVERSITY OF VIRGINIA, Charlottesville, VA

Doctorate of Philosophy in Mechanical and Aerospace Engineering, August, 2004

Field of Study: Finite Element Analysis of Biological Systems

Master of Science, Mechanical Engineering, January, 1997

Field of Study: Finite Element Analysis of Magnetic Bearings

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA

Bachelor of Science, Mechanical Engineering, June, 1993

CONFERENCE PAPERS AND PRESENTATIONS

“Finite Element Modeling of the Subaxial Cervical Spine Under Physiologic Loads,” with PE Allaire, FH Shen, K Darvish, HG Wood, DG Anderson, American College of Surgeons 90th Annual Clinical Congress, New Orleans, LA, October 2004.

“Radial Planar Magnetic Bearing Analysis with Finite Elements Including Rotor Motion and Power Losses”, Proceedings of the 42nd ASME Gas Turbine and Aeroengine Conference, 1997, ASME Paper 97-GT-503, with PE Allaire and MEF Kasarda.

“Design and Rotor Dynamics Analysis of a Magnetic Bearing Supported Prototype Textile Spindle”, Proceedings of MAG '97, 1997, pp. 47-56, with PE Allaire, R Hammond, et al.

“Magnetic Field Finite Element Modeling of Magnetic Bearings Including Rotor Motion Effects and Eddy Currents”, Proceedings of the 5th International Symposium on Magnetic Bearings, 1996, pp. 241-246, with PE Allaire, JC Heinrich and GK Foshage.

“Magnetic and Electric Field Equations for Magnetic Bearings”, Proceedings of MAG '95, 1995, pp. 259-270, with PE Allaire, and MEF Kasarda.