

HIRED RESUME SERVICE

MECHANICAL / STRUCTURAL ENGINEER— Job ID: 4850

Highly educated with Ph.D. degree in Mechanical Engineering. Offering exceptional academic achievements and considerable research experience related to mechanical and structural engineering. Solid knowledge and research experience in nonlinear finite element methods and proven technical programming and modeling experience.

KNOWLEDGE / SKILLS / ABILITIES

- Vibrations / Dynamics
- Heat Transfer & Solid / Fracture Mechanics
- Adept in probability and statistics, and experience with parallel computing.
- Knowledge of model physics, principles, setup, calibration, validation and sound analysis skills.

SUMMARY OF QUALIFICATIONS

- Strong ability to plan and conduct research on mechanical and structural response, evaluate damage of systems, components and equipment.
- Capable of evaluating, implementing and developing techniques, computer models, and experiments.
- Adept in analyzing data, and developing new techniques to identify trends in intensity and frequency.
- Ability to compose reports and deliver presentations describing the results of studies in progress, or completed.
- Capable of developing and implementing strategic plans for risk management and loss prevention.
- Researcher able to produce measurable, significant improvements in the ability to estimate future property loss.

TECHNICAL PROFICIENCIES

Software: Pro/ENGINEER, SolidWorks, AutoCAD, ABAQUS (Simulia), ANSYS, VGStudio MAX, R (Statistical computing), Hypermesh

Computer Languages: C/C++, Fortran, Python and MATLAB

Instruments and techniques: Micro-Computed Tomography, FTIR Spectroscopy, SEM, Digital Image Correlation, Photoelasticity and Acoustic Emission

EDUCATION

Ph.D., Mechanical Engineering, University of Minnesota - Twin Cities, MN, August 2014,
GPA: **3.87/4.0**, Adviser: Dr. Alex Fok

M.S., Mechanical Engineering, University of Minnesota - Twin Cities, MN, Sept. 2012
GPA: **3.84/4.0**, Adviser: Dr. Sue Mantell

B.Tech., Production and Industrial Engineering, Indian Institute of Technology Roorkee, India, May 2009
GPA: **8.3/10**

PROJECT AND RESEARCH EXPERIENCE

Research Assistant (Ph.D. Thesis Project) University of Minnesota – Twin Cities, MN, 06/2011–present

Project: Structural integrity assessment of Very High Temperature Nuclear Reactor (VHTR) core components using a probabilistic continuum damage mechanics model.

- Built, implemented non-linear constitutive model for modeling stresses in the Very High Temperature Reactor (VHTR) core components (graphite and composite materials) using user-subroutine UMAT in finite element software Abaqus.
- Simulated fracture in the VHTR components using Extended Finite Element Method (XFEM) and made failure probability predictions for the components by performing Monte Carlo simulations.
- Simulated standard failure tests using FEM to predict the effect of material heterogeneity and size on the failure properties of brittle materials; simulation included contact modeling.
- Conducted experimental tests (three-point and four-point bend tests) to measure the mechanical properties of nuclear graphite which were later used in performing finite element simulations and validating the results.

Senior Year Project, Indian Institute of Technology Roorkee, India, 08/2008 – 05/2009

Project: Investigation of effect of drilling tool geometries and process parameters on the damage of FRP composite – A FEM and experimental approach.

- Modeled the drill bits in Pro/ENGINEER and simulated the drilling process of fiber reinforced plastic composite in Abaqus to understand the effect of process parameters and drilling tool geometries on the damage in composite.
- Performed experiments to quantify the delamination occurring in composite during drilling.
- Used Design of Experiments technique to evaluate the optimum combination of drill bit geometry and process parameters, which minimize the damage in FRP composite during its drilling.

Research Assistant (M.S. Thesis Project) University of Minnesota, Twin Cities, MN, 01/2010–01/2011

Project: Durability of High Density Polyethylene for potable hot water applications: crack propagation.

- Conducted experiment for oxidizing High Density Polyethylene (HDPE) films at accelerated rate and performed FTIR spectroscopy and performed tensile tests to measure the brittleness of degraded HDPE films.
- Performed fracture tests on HDPE films to understand the effect of oxidation on crack growth rate.
- Analyzed images in MATLAB to measure rate of crack propagation as a function of time.
- Performed numerical modeling in MATLAB to predict life time of HDPE pipes.

Research Assistant, University of Minnesota, Twin Cities, MN, 03–04/2013

Project: Heat transfer analysis during dental restoration using finite element method.

- Simulated the heat transfer process for the curing of composite during the dental filling in Abaqus.
- Implemented heat flux conditions through user subroutine DFLUX
- Performed the finite element analysis for different values of the thermal parameters (heat generation, conduction and convection) to understand their effect on the temperature in the nerve region of the tooth.

Finite Element Code Programmer, University of Minnesota, Twin Cities, MN

Project: Pure Bending of a Cantilever Beam (Course: Non-linear Finite Element Method, Spring 2012)

Project: Stretching of a Plate with a Hole (Course: Introduction to Finite Element Method, Spring 2010)

- Wrote finite element codes from scratch in MATLAB to perform stress and deformation analysis.

Undergraduate Project, Indian Institute of Technology Roorkee, India, 10/2006 – 03/2007

Project: Modeling and analysis of stresses at the window-fuselage interface in an airplane fuselage

Modeled the Boeing 747 fuselage section in SolidWorks and analyzed the finite element model in ANSYS for stresses at the fuselage-window junction.

- Secured ‘Certificate of Excellence’ for the paper presentation based on this work at COGNIZANCE 2008, a national level technical fest held at Indian Institute of Technology Roorkee.

Teaching Assistant, University of Minnesota - Twin Cities, MN, (Fall 2010, Spring 2011)

Course: Design and Manufacturing | Course: Computer – Aided Engineering

- Delivered lectures and conducted recitation on different topics on synthesizing and analyzing linkage mechanisms.
- Guided students in their projects which involved building prototypes of machines and designing machine elements.
- Guided students in their Computer-aided design (CAD) projects.

JOURNAL PUBLICATIONS / CONFERENCE PROCEEDINGS / PRESENTATIONS

G. H. Li and A. Fok, Size Effect on the Fracture Properties of Nuclear Graphite, Symposium on Graphite Testing for Nuclear Applications: the Significance of Test Specimen Volume and Geometry and the Statistical Significance of Test Specimen Population, Seattle, Washington, September 19-20, 2013. Accepted for publishing in ASTM Selected Technical Papers (STP), ScholarOneTM, 2014.

G. H. Li, A. Fok and S. Mantell, Failure Simulation of a VHTR Core Reflector Brick, 22nd International Conference on Structural Mechanics in Reactor Technology, San Francisco, California, August 18- 23, 2013.

G., S.C. Mantell and J.H. Davidson, Durability of polymers for solar thermal applications: Crack propagation in degraded polymers, American Solar Energy Society (ASES) National Solar Conference, Raleigh, North Carolina, May 17-21, 2011.

G. S.C. Mantell and J.H. Davidson, Prediction of degradation of polymer tubes used in solar domestic hot water components, Society of Plastics Engineers’ ANTECTM (Annual Technical Conference), Boston, Massachusetts, USA, May 1-5, 2011.

H. Ge, G. and S. C. Mantell, Fracture Behavior of Degraded Polyethylene Thin Films for Solar Thermal Applications, Energy Procedia, 30, 783-792, 2012.

H. Li, J. Li, G. and A. Fok, Fracture Behavior of Nuclear Graphite NBG-18, Carbon, 46-56, 2013.

Presentation, G., H. Li. A. Fok and S. Mantell, Structural Integrity Assessment of Graphite Components in a VHTR Core, 20th International Conference on Nuclear Engineering, Anaheim, California, July 30-August 3, 2012.