CREAN & ASSOCIATES
AEROSPACE EXPERTISE
FOR WHEN IT DOES TAKE A ROCKET SCIENTIST

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Zulfiqar Ali

CAREER SUMMARY

- 12 years of experience using design in Pro Engineer and Finite Element Analysis for wide range of problems.
- Extensive experience of modeling, static, fatigue, damage tolerance, and dynamic analysis.
- Extensive experience in using Finite Element codes like Nastran and ABAQUS
- Bending moment and shear force diagrams, buckling analysis, torsion, bending and combined loading of the structure.
- Hand Calculations for welded and bolted joint analysis, stress calculations
- Experience in performing topology optimization using OptiStruct and TOSCA
- Extensive meshing experience at both system and component level using MSC Patran, HyperMesh, and Simlab and Abaqus

PROFESSIONAL EXPERIENCE

John Deere **2015 - July 2019**
Structural Engineer **-** Moline, IL

- Performed finite element analysis on a variety of John Deere combines. Usage of contact pairs, connector elements in abaqus for mechanisms. Non linearity involving NLGEOM, material and contact pairs. Application of high displacement to eliminate convergence issues and evaluate net section yield. Improvement of castings based on FEA results and then make recommendations for design changes.
- Usage of metallic and non-metallic materials. Performed topology optimization using TOSCA and then doing iterations using perturbation analysis to develop understanding of load path in numerous pulleys and associated sheet metal structure used in a combine.
- Satic, dynamic, elastic – plastic and hyper – elastic simulations, fatigue and fracture mechanics.
- Developed a special technique using Abaqus Explicit analysis to prevent grain loss in combines. This resulted in significant savings for grain loss during peak harvest season.
- Usage of Ncode to obtain fatigue life of structures in terms of number of cycles or hours.
- Demonstrated ability to work with design team, analyze and document the relevant load cases within available time. Preparation of reports and document the recommendations based on FEA results.

Oceaneering **2013 - 2015**
Mechanical Engineer – Houston, TX

- Worked on the Hydraulic power unit in the BOP division, doing design calculations for spring loaded hydraulic valves. Completely designed the structure of Acoustic Pod for subsea operations.
- Finite element analysis on various valves using Ansys and Nastan. FEA on shear seal valve, timing cylinder, stayput valve using Ansys and Nastran., patent pending – stay put vale.
- Performed Geometric dimensioning and tolerancing using ANSI Y 14.5 on drawings and checking them for manufacture.

American Bureau of Shipping **2011 – 2013**
Structural Analyst – Houston

- Drew comparison between different US Navy ships, then updating the FE model (using FEMAP and Nastran) based on those comparisons using computer simulations, doing the fatigue life
- Calculations based on the kind of loading ship was subjected to during its journey and predicting its remaining life cycle. Doing forced frequency response analysis to avoid resonance from various components. Non-Linear buckling analysis of structures, tensile testing, strain hardening techniques to predict failure and life of the components. Elastic and plastic analysis of materials used on US Navy ships.

CaterPillar Inc **2005 - 2010**
Finite Element Analyst - Mossville, IL

- Worked on CaterPillar brand new engines, including analysis of push rod, insert rocker arm and other components of the engine. This includes performing hand calculations and finite element analysis of the models.
- Hand calculations for welded joints, bolted joints. Stress strain transformation, Fatigue calculations using stress based and strain-based techniques. Conduct design and finite element analysis (FEA) of transmission components which include clutch pistons, carriers; gaskets; gears, shafts, etc. Have completed the analysis and design work of at least three Caterpillar transmissions from conceptual to production phase. All of this was done using MSC Nastran and Patran. Meshing was done in simlab/HyperMesh and Patran.
- Utilized Optistruct to improve and optimize the structural designs.
- Linear, non-linear buckling analysis, secant method for buckling analysis with eccentric loading.
- Experienced in performing static analysis, modal analysis, forced frequency response analysis, bolted joint and dowels analysis, weld joint analysis, topology optimization, G Load analysis, nonlinear material and geometric analysis, contact analysis.
- Conduct stress, displacement, bolted joint and fatigue analysis on complete transmission assemblies and other internal components for several Caterpillar made transmissions. The application of these transmissions range from Marine, Well Services, Compactors, On-Highway, Off-Highway Trucks.

EDUCATION

M.S**.,** Mechanical Engineering - University of Central Florida, Orlando (UCF)